SYSTEMATICS AND MORPHOLOGY OF THE TRIBE ANISOSCELINI, COREIDAE (HETEROPTERA).

by

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ABSTRACT

The tribe Anisoscelini is revised on the basis of large collections of all known species from the principal museums of the world. The apparent relationship of Anisoscelini with other tribes of Coreidae based on their morphological characters is discussed. Within the tribe Anisoscelini three groups of genera are recognized, the Anisoscelis group consisting of 6 genera and 21 species, the Leptoglossus group of 7 genera and 49 species and a rather isolated Diactor group with a single genus and 2 species, which may represent the nucleus of a larger group of species. Within Leptoglossus sens. lat. several genera are recognized, including four proposed as new, and the genus Theognis is reerected as valid and distinct. The genus Uranocoris is removed from Anisoscelini and provisionally transferred to the tribe Homoeocerini.Thirteen new species and three new subspecies are described. All hitherto little known and inadequately described species are redescribed. The illustration of male and female genitalia and hind tibia as well as the measurements and ratios of several parts of the body of all studied species are given. The distribution of all species are shown on maps and the information on biology and habits available for some species are also given.

The external morphology and the morphology of the male and female genitalia are described and illustrated.

A key to the genera and species studied is provided.

Nine neotypes and nine lectotypes are designated, and eight new synonyms indicated.

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INTRODUCTION

The purpose of this study is to revise all available information on the tribe Anisoscelini, as a contribution to a better and comprehensive knowledge of the tribe.

Anisoscelini is a tribe of the subfamily Coreinae, family Coreidae. Except for one species the tribe is restricted to the New World, with the apparent centre of speciation in South America. The tribe always has been recognized and distinguished from the other Corcidae by usually well developed hind tibial dilation; the biology and habitat of most species are little known although some are reported as economically important pest of various crops; in general they feed on a wide variety of plants, mainly on fruit. Since Stàl (1870) no detailed studies have been carried out on this tribe as a taxonomic unit, except by Schaefer (1965) on relationships of Anisoscelini with other Coreidae, and by Allen (1969) who excellently revised the genus Leptoglossus sens lat.

HISTORY

The first species of Anisoscelini ever described was Linnaeus' Cimex phyllopus 1767, in the 12th edition of Systema Naturae. The first illustration was Drury's (1770) of an unnamed species described later by Linnaeus as Cimex balteatus 1771, which was the second known species of this tribe as now understood.

Several other species of the tribe were described by Fabricius between 1774 - 1803 in the genera Alydus, Cimex and Lygaeus.

Thunberg (1822) erected the genus Copium for C. cornotum, which however was found later by Stal (1868) to be a Tingid; in the meantime however Thunberg (1825) described another two species in Copium which represent true Anisoscelini.

St. Farg. & Serv. (1822) erected the genus Holhymenia for H. latreillei; Holhymenia was emended by Burmeinster (1834) as Holymenia but this action is considered unjustified.

Latreille (1829) erected the genus Anisosceles to include all known species described by Linnaeus (2 species) and Fabricius (7 species), characterized by filiform antennae and foliaceous hind tibia.

The genus Diactor was erected by Perty (1830) for D. elegans (= bilineatus Fabricius). Guérin (1831) erected the genus Leptoglossus for L. dilaticollis; this genus remained monotypic and almost forgoten until 1870, and another genus, Chondrocera erected by Laporte (1832) for C. laticornis was also monotypic until the present study.

From 1831 to 1853 the number of species increased considerably and most of them were described in Anisoscelis by Say (1831), Burmeinster (1835), Westwood (1842), Dallas (1852) and Herrich-Schaeffer (1853).

The first reference to Anisoscelini as a group dates from 1843, when Amyot & Serville divided their race "Linicornes" into two groups Anisoscelides and Alydides. The name of the former was based on Anisosceles Latreille 1829 and included the following genera known at that time: Anisosceles and Diactor, and Leptoscele and Tynotome now excluded from Anisoscelini.

Stål (1862) erected the genus Theognis to include the Anisoscelini with the 1st antennal segment equal to the length of the head, and the genus Narnia for those species with 1st antennal segment shorter than the length of the head.

Spinola (1850) in his classification of Hemiptera used the name Anisosceloideae for the group of genera consisting of Anisoscelis, Copius, Diactor and 3 other genera now excluded from Anisoscelini.

Mayr (1865, 1866) described several new species in the genus Theognis based principally on the material collected during the "Novara Expedition", but most of them were later synonymized with the other species.

The knowledge of the group increased considerably with the work of Stål (1854 - 1873), especially by his paper published in 1870 in which all the known species are listed in Anisoscelidina, three new genera Tarpeius, Baldus and Microphyllia are erected, but Theognis is synonymized with Leptoglossus, and five new species described.

Walker (1871) added three valid species and erected the genus Uranocoris for U. suavis, but I have transferred this genus provisionally to the tribe Homoeocerini; Distant (1881-82) added further two species but one of them is synonymized in this study. Berg (1892) described three species but one was synonymized and other was relegated to subspecific rank by Allen 1969. Lethierry & Severin (1894) in their catalogue included ten genera and sixty species of which only fourty seven are now valid species. All these forms were described from Neotropical region with one species from Ethiopian Oriental and Australian regions.

Most of the present knowledge of North American (Neartic) Anisoscelini are due to contributions made by Heideman (1909) and more recently Barber (1918) who together described five species of Leptoglossus from that region, one of which is a synonym, and the other have been transferred to a different genus. Kiritshenko (1935) reerected the genus Theognis, and transferred to it all species of Leptoglossus except one; this action was supported by Hussey (1953) but recently rejected by Allen (1969) whose work represents the first comprehensive and critical study of the genus Leptoglossus.

The above historical review indicates that the present knowledge of the tribe is superficial and concerns almost exclusively the taxonomy and recognition of species but even this subject is rather fragmentary; except for Allen's revision of the genus Leptoglossus, only keys for recognition of genera and species have been published. The biology of only few species have been studied, and the collection data are rather incomplete, rarely given exact locality, date of collection or the host plants.

MATERIAL AND METHODS

This study was based on material from the collections of the principal museums of Europe, South America and U.S.A. Most of the material was preserved in the collections of the British Museum (Natural History) and the collection in the Instituto de Zoologia Agricola, Facultad de Agronomia U.C.V., Venezuela; some of the material from the latter institution was collected by the author himself. Altogether the available material consisted of well over 5000 specimens, and was borrowed from the following institutions which made their material available for this study; the abbreviations conform with those recommended and used in the British Museum.

AMNH American Museum of Natural History, New York, U.S.A.

BMNH British Museum (Natural History), London.

CM Carnegie Museum, Pittsburgh, U.S.A.

DEI Deutsches Entomologisches Institut, Eberswalde, East Germany.

IRSNB Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium.

IZA Instituto de Zoologia Agricola, Maracay, Venezuela, including specimens from Centro de Investigaciones Agronómicas (CIA).

MLP Museo La Plata, La Plata, Argentina.

MNHN Muséum National d'Histoire Naturelle, Paris, France.

MNHU Museum fur Naturkunde der Humboldt-Universität, Berlin, Germany.

MRAC Musée Royal de l'Afrique Centrale, Tervuren, Belgium.

MRCN Museo Rio-Grandense de Ciencias Naturais, Porto Alegre, Brasil.

NMP Národní Museum v Praze, Entomology Department, Kunratice, Praha, Czechoslovakia.

NM Naturhistorisches Museum, Wien, Austria.

NR Naturhistoriska Riksmuseet, Stockholm, Sweden.

RNH Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.

SEM Snow Entomological Museum, Department of Entomology, The University of Kansas, Lawrence, U.S.A.

SSPA Servicio Shell, Cagua, Venezuela.

TM Természettudományi Múzeum, Budapest, Hungary.

UM University Museum, Oxford, England.

URDE Departamanto de Entomología, Facultad de Humanidades y Ciencias, Universidad de la República, Montevideo, Uruguay.

USNM U.S. National Museum, Washington, D.C., U.S.A.

UZM Universitetes Zoologiske Museum, Kobenhavn.

ZI Zoological Institute Academy of Science of the U.S.S.R., Leningrad, U.S.S.R.

ZIU Institute of Zoology, University of Uppsala.

ZMU Zoological Museum of the University, Helsinki, Finland.

ZSBS Zoologische Sammlung des Bayerischen Staates, Munchen, West Germany.

The type material available for examination were: Stal's types from NR; Fabricius' types from UZM; Dallas and Walker's types from BMNH; Mayr's types from NM: Guerin-Meneville's types from MNHN;

Blöte's types from RNH; Breddin's types from DEI; Westwood's types from UM; Berg's types from LPM; Heidemann and Barber's types from USNM; Allen's types from CM, SEM, AM, BMNH, NR and TM. Most type specimens of the previously described species were examined and dissected. Lectotype specimen was designated from all available syntype series of original material, the remaining syntype specimens being labelled as paralectotypes. A single type specimen of any material, holotype (Art 73a of the International Code of Zoological Nomenclature) was regarded as such and accordingly labelled, supplementing the simple "type" label or sometimes disregarding the "type" label if it was found attached to the specimen erroneously or by mistake; all the original labels of type specimens were left attached to the pin, even if they did not conform with the actual status of the specimen, but in such cases the old incorrect "type" labels were put face down to avoid future confusion; the "type" labels used were of the kind used in the British Museum (Natural History) i.e. circular labels with different colours for different status of the particular specimen (see key to labels) (p. 14).

All nomenclatorial decision and changes were made in strict conformity with the International Code of Zoological Nomenclature and where necessary all decisions were taken by me as first reviser to satisfy the interest of stability of nomenclature.

Full synonymy is given for each species with complementary information relevant to the status of types.

All material examined consisted of dried pinned specimens. For dissection of genitalia the specimens were relaxed overnight by leaving them in a plastic container with damp sand. All the observations were made under the stereoscopic microscope (8.75 x to 150x). Two pairs of watchmaker's forceps size 5, a curved microscissors, a set of pins of 00 to 2 sizes, and micro-needles suitably bent were used as dissecting tools.

All measurements were made in mm. and were made with calibrated square eye-piece. The measurements of the characters listed in tables were taken as follows: (1) Body length, along the median line, from the apex of juga to the apical margin of the membrane of corium, with wings folded over abdomen. (2) Head length, along the median line, from apex of juga to the collar. (3) Head width, across the eyes. Distances: (4) Inter-ocular distance from eye to eye on dorsal surface. (5) Ante-ocular, apex of juga to anterior margin of the eye. (6-9) Antennal segments length, from base to apex of each segment; in the length of the IIIrd segment is included the intersegmental node between IIIrd and IVth segment. (10) Ist labial segment length, from anterior margin of buccula to the apex of the segment. (11-13) Labial segments II to IV length, from base to apex of each segment. (14) Pronotum length, along median line, from collar to posterior margin. (15) Pronotum width, from humeral angle of one side to the other. (16) Scutellum length, along median line, from posterior margin of pronotum to the apex of scutellum. (17) Scutellum width,

the widest part of scutellum at the level of posterior margin of pronotum. (18) Hind tibia length, along the external margin from proximal to distal end. Tibial dilation: (19) Total width, greatest width of tibial dilation. (20 and 22) External and internal part length, from one extreme to the other, accurate measure is sometimes difficult because of the gradual widening of the dilation at one or both extremes. (21 and 23) External and internal part width, the widest portion measured in perpendicular line from shaft of tibia to the margin of the dilation. (24) Undilated portion, along the external margin, from most distal portion of external tibial dilation to the apex of tibia.

All illustrations were made with the aid of square eye-piece and square paper; great care was taken to reproduce as accurately as possible the shape of each genital structure, but the pubescence was omitted. Morphological details of the species are illustrated on plates 4 to 71 each and include the following: (A and B) dorsal and lateral view of genital capsule. (C and D) dorsal and internal view of paramere. (E) lateral left view of the phallus (phallobase omitted). (F) ventral view of process 5a. (G) lateral view of left Ist gonocoxa. (H) dorsal view of spermatheca. (I) dorsal view of hind tibia. It is important to mention that even slight differences in the position of different parts of genitalia may result in differences of their appearance; this is particularly true with regard to: the shape of paramere, due to the curvature of the shank and hook, the shape of process 5a

of phallus (fig. E) due to differences in the angle at which it is projected in relation to the axis of the phallus, and to the shape of Ist gonocoxa and spermatheca; this also applies to the shape of hind tibia, particularly in those species where the dilation is posteriorly concave.

Each scale-line on plates 4 to 71 represents 1mm. except for figs. C and D where it represents 0.5mm.

In addition to the evaluation of external morphological characters, special attention was given to the study of male and female genitalia. The characters of male genitalia, as in previous works, are used here for recognition of species, but the use of a more elaborate technique for the evertion of the phallus made it possible to expose all the structures of the conjunctiva, including some which had been overlooked by previous authors. The female genitalia are also of high taxonomic value for the recognition of species and genera and are used here for the first time within the tribe. A total of 267 male genitalia and 287 female genitalia were dissected in the course of this study. The osmotic method first used by Ashlock (1957) was initially used for the inflation of the phallus, but it was found unsatisfactory. Only in a few cases and after long manipulation was full inflation achieved and it was always necessary to break the capsule to remove the phallus without damaging it.

In view of these difficulties, the following technique was applied with better results. After the specimen has been relaxed it is very easy to pull out and remove the genital capsule by pressing with the tip of the forceps several times all around the posterior margin of the VII th sternite and thus to soften and relax the connecting membranes. Once the capsule is thus loosened, the tips of the forceps are inserted between the VIIth and VIIIth sternites, or between the VIIIth and the capsule itself and a gentle backward push will make the capsule come out without difficulty. The attempts to remove the capsule by pulling it backwards usually result in damaging it. The isolated genital capsule is transferred into hot 10% KOH for 1½ to 3 minutes, the time depending on the size and the condition of the specimen; special care must be taken if the walls of the capsule are damaged or fragile (probably due to killing or preserving technique) because in this case the phallus is very delicate and can disintegrate in potash if left there for more than one minute; such cases are recognisable by the general appearance of the specimen, usually there are some deformations, particularly of the protuberances of the integument (e.g. humeral angles) and the abdominal sternites are usually collapsed. The capsule is then washed in distilled water and cleared of the macerated soft internal tissues; if necessary the capsule is returned to the KOH for another minute or so. When the capsule is sufficiently cleared and the intersegmental membrane cut off, the phallus is removed by separating the phallobase from the suspensory apodemes (sa. pl. 2, fig. 4); to do this the apodeme is held in position by one tip

of the forceps introduced into the genital cavity, below the paramere and as close to the wall of the capsule as possible, until the apodeme is reached and held against the wall of the capsule; great care must be taken not to puncture the phallotheca during this procedure. The other pair of forceps is introduced through the anterior opening into the capsule to hold the junction between the stapes (sta.$^{pl.2}_{\wedge}$ fig. 8) and the transverse bridge (tb.$^{pl.2}_{\wedge}$ fig. 8) of the phallobase which then is pulled forwards and separated from the suspensory apodeme; the same procedure is carried out to separate the phallobase from the suspensory apodeme on the other side of the capsule; the phallus is then pulled out through the anterior opening of the capsule, but care must be taken not to damage the proctiger. The parameres are easily removed by pulling them out from their membranous basal articulation. The evertion of the phallus begins with loosening the invaginated conjunctival membrane by pressing gently all around the phallotheca; then the spical aperture of the latter is carefully extended with the forceps; holding the phallotheca with one forceps in its natural position, the dorsal fold, if present, is lifted up, after which, or if the dorsal fold is absent, the dorsal sac is drawn out as much as possible. This action, in correctly softened phallus of any specimen of the Anisoscelis group of genera, will bring almost the whole of the conjunctiva out of the phallotheca, with the ejaculatory reservoir shifted well away from the phallobase. In most species of the Leptoglossus group of genera the evertion of conjunctiva is achieved only after gradual pulling out the processes 8a-b and 9a-b

by careful manipulation with the forceps. Now the basal membrane of the phallotheca is cut open along the dorsal margin of the transverse bridge (tb. pl.2 fig. 8); and the internal hyaline band (hb. pl.2 fig. 9) supporting the ductus seminis is cut with a pair of micro-scissors; then the ejaculatory reservoir can be moved towards the distal portion of the conjunctiva. This displacement is achieved by pushing the ejaculatory reservoir as much as possible from inside the phallotheca towards the apex of conjunctiva. Then holding with one pair of forceps the base of process 5a, the basal portion of the phallotheca is gradually and gently pulled with other forceps, alternatively from dorsal side to ventral and from one side to the other; this action brings the ejaculatory reservoir to the apex of the conjunctiva, and the process 5a will be fully exposed. If satisfactory evertion of conjunctiva is not achieved in 3 or 4 attempts, it is better to transfer the phallus again to hot KOH for one minute and repeat the procedure. Manipulation of the process 5a should always be gentle and held only by the base as it can be easily broken off.

After the evertion, the next step is to extend the dorsal sac and all the processes from the inside of phallotheca and conjunctiva, using conveniently bent pins of different sizes. Once the conjunctiva is fully everted and its processes extended, they will remain in that condition without folding back.

The phallus and other genital structures should be rinsed in dilute acetic acid and transferred to a container with glycerine, the trapped air removed and then placed in a microvial with glycerine;

which is attached to the pin of the specimen.

Key to the labels used for the examined type material in the collections.

red = Holotype

red = Allotype

red = Neotype

yellow = Paratype

pale blue = Lectotype

purple = Paralectotype

Abbreviations used in the lists of examined material

s.d. = same date

s.l. = same locality

s.c. = same collector

Symbols used on maps (circle, triangle, square)

(a) fully or half in black indicate material examined in this study.

(b) black outlined only indicate other records.

(c) underlined symbols indicate that no precise location was given.

(d) the same symbols but with question marke indicate doubtful location.

Key to lettering on plates of Morphological details, see chapter on Morphology (p. 30)

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MORPHOLOGY

(Plates 1, 2, 3. pag. 33 - 38)

The aim of this chapter is to give a general discussion of the most relevant morphological characters of Anisoscelini used in the descriptions, keys and phylogenetic considerations. It is not intended to be a detailed description of all external morphological aspects of the tribe. A detailed study of the morphology of the thorax of Veneza zonata Dallas was carried out by me prior to this research and is being prepared for publication; detailed study of the morphology of head, abdomen and genitalia of males and females will be carried out as a second contribution to the knowledge of the morphology of Coreidae. The terminology used conforms with that generally employed in Heteroptera, particularly by Snodgrass (1935) and Parsons (1962 and 1963 a and b.)

Head.- Horizontal, porrect and produced anteriorly. The eyes (ey. fig. 2) are large and globular, sessile or subpedunculate, in dorso lateral position, anterior margin just behind the level of half length of the head; the ocelli (oc, fig. 1) are small, slightly protuberant and close to eyes; the inter-ocellar distance and the distance between the ocellus and the eye are very constant within the tribe.

The head capsule has lost most of the sutures found in the primitive insects and most of the areas of the head are not defined by clear cut boundaries. The dorsal surface, the vertex (vx. fig. 1) occupies the area behind the eyes at the level of ocelli; anterior to it is the frons (fr. fig. 1) which occupies the area between the eyes;

anterior to ocelli there is a pair of pre-ocellar pits (pop. fig. 10) (considered by Parsons as anterior tentorial pits); anterior to frons is the clypeus, with an elongate narrow anterior portion referred to as tylus (ty. fig. 1,2) (or ante-clypeus) and a broader, not well defined, posterior portion, or post-clypeus. The tylus forms the anterior-most part of the head, sometimes rather prominent and projecting antero-dorsally; anteriorly it is deflected ventrally providing articulation to the labrum. The juga (ju. fig. 1,2) are placed lateral to the tylus but separated from it by conspicuous longitudinal sutures. The antenniferous tubercles (at. fig. 1) are located between juga and the eye and level with the latter. Each jugum extends vertrally below the antenniferous tubercles and the eyes, and reaches the maxillary plates from which it is separated by distinct suture. The maxillary plates (ma. fig. 2) are small and located between the juga and buccula (bu. fig. 2) which are plate like structures, each located laterally at the base of the labium. Behind the maxillary plates the genae (ge. fig. 2) form the sides of the head and extend up to the neck. The gula (gu. fig. 2) makes up the ventral surface of the head, and anteriorly, together with buccula provides articulation for the labium. The posterior-most portion of the head is slightly constricted to form the so-called neck (ne. fig. 1), which is telescoped within the prothorax.

The antenna (at. fig. 1) articulated in the apical socket of antenniferous tubercles; the Ist antennal segment is usually clavate and slightly carinated. sometimes uniformly cylindrical;

segments III to IV usually cylindrical, variable in length, occasionally the IInd and IIIrd with flat lateral expansions; the IVth always cylindrical. The 4 segmented labium (la. fig. 2) arises from the antero-ventral part of the head; the relative lengths of the first three segments are more or less constant in the whole tribe, but the IVth is variable; the total length of the labium is also variable within the tribe, from short, not exceeding the metasternum, to long extending well beyond the apex of the abdomen.

Thorax.- Prothorax. The pronotum is subtrapezoidal, its anterior margin is separated by a narrow constriction to form the so-called collar (co. fig. 1) which extends around over the pleural and sternal areas. The transverse convex area behind the constriction represents the calli (ca. fig. 1,2) (= pronotum, protergum) which is usually divided into two oval areas by a median slightly elevated portion which occasionally carries a pair of small processes; the surface of calli usually shows different sculpture from that of the rest of pronotum. The pronotum has a broad postero-dorsal expansion commonly known as disk (di. fig. 1,) reaching the base of scutellum, and covering and protecting the soft anterior portion of the mesonotum. The anterior portion of the disk is declivent to different degrees, occasionally almost vertical; the postero-lateral portion of the disk is projected to form the humeral areas (= humeri) (har. fig. 1) which are variable in the direction and degree of protuberance; the apical portion of each humeral area represents the humeral angle (han. fig. 1), variable in shape, size and direction. Six margins are referred to in the description of pronotum; one anterior represented by the

collar, two lateral margins (lmp. fig. 1), two postero lateral margins (plm. fig. 1) and one posterior margin; the lateral and postero-lateral margins vary in shape, degree of prominency and sculpture of the integument i.e. they may be serrate, tuberculate, dentate, etc; posterior margin varies in shape, usually it is depressed, occasionally with posterior extensions on the sides of the scutellum. The sculpture and colour of the surface of pronotum and particularly of the disk is quite variable and is frequently used for separation of species.

Modifications comparable to those of pronotum occur also in the propleural region, mainly due to the development of postero-dorsal expansion of the epimeron. The pleura (pl. fig. 2 shaded area) occupies the central area of the propleural region, anteriorly reaching the lateral portion of collar, and bounded dorsally by the pleural callus (pc. fig. 2), an elongate slightly curved and convex area, usually with sculpture different from the rest of the propleural region and sometimes also of different colour; posteriorly it is broadly expanded into postepimeral flange I (pef. fig. 2) dorsally joined to pronotal expansion (the disk) but separated from it by the lateral margins; ventrally the pleura is expanded into episternal and epimeral supracoxal lobes I (sl. fig. 2 shaded area), separated from each other by the coxal cleft (cc. fig. 2); the area between the episternal supracoxal lobe and the collar is known as precoxal bridge, which connects the pleura with the sternum.

The sternum is very small with large coxal cavities.

Mesothorax.- The only visible area of the mesonotum is the scutellum (sc. fig. 1,2), triangular, usually longer than wide at base, with various relief and sculpture. The mesopleura (pl. fig.2 shaded area) broad, ventrally expanded into two supracoxal lobes II (sl. fig. 2, shaded area) separated by a short coxal cleft (cc. fig. 2), the episternal lobe being larger than the epimeral, and connected with the sternum by a wide, precoxal bridge (pb. fig. 2). The pleura is expanded postero-dorsally into the post epimeral flange II (pef. fig. 2) which partially covers the antero-dorsal corner of the metapleura.

The mesosternum is broad with a median longitudinal depression.

Metathorax. The metanotum is only visible when the wings are open; it is very constant in shape and shows no taxonomically important characters within the tribe except some differences in colour.

The metapleura is highly modified by the enlarged coxa and the presence of the ostiole i.e. the opening of the metathoracic scent gland. The pleura (pl. fig.2 shaded area) is extended ventro-posteriorly into a single, not divided supracoxal lobe III (sl. fig.2); anterior to the latter there is the opening of the scent gland, surrounded by the peritreme (pe. fig. 2); dorsal to the peritreme and extending over the ventral half of the post-epimeral flange II is the evaporative area (ea. fig. 2, shaded area) which is microscopically granulated and bears a series of irregular ridges.

The metasternum is short and wide, separated from the pleura by the peritreme and the stink groove.

Legs.- All legs are similar and of the most generalised type found in insects, except the hind legs which are rather long and thick, with the tibia usually broadly foliaceous (phylliform) (tdl . fig. 1); so far no function has been suggested for this foliaceous condition of the tibia, but it is known that in some other Coreidae the spinose hind legs are used as defensive weapons; also the shape of the pronotal extension and the position of the hind legs of some Coreidae are used as camouflage being almost identical with spines of the branches on which they are commonly found.

Wings.- The fore wing is typically an hemelytron with the usual areas and sutures of this type of wing i.e. corium, membrane, embolium (em. fig. 1, shaded area), clavus (cl. fig. 1, shaded area), median suture (ms. fig. 2) and claval suture (cs. fig.1). In the genus Holhymenia the sclerotization of the wing has been lost and become transparent, with conspicuous black longitudinal veins. The coriaceous portion of the wing has a very specialized wing venation; the sequence of longitudinal veins from anterior to posterior margin is as follows: Subcosta (Sc. fig. 1); Radius + Media (R + M. fig. 1), which halfway along the corium become separated, and the separated Media runs parallel to the median suture; Cubital (Cu. fig. 1) is connected with the distal portion of M by the cross vein m.cu (fig. 1); clavus has a single vein which represents the fused Postcubital + 1 Anal (Pcu + 1A. fig. 1), but

often simply referred to as Pcu.1. The membrane shows a variable number of parallel anastomosing longitudinal veins which are difficult to interpret and their homologies and relationships with the veins of corium have not been established. The colour of corium differs considerably in different forms of Anisoscelini, and is of taxonomic value at specific and generic levels.

The hind wing is entirely membranous, and has no taxonomic significance within this tribe.

Abdomen.- The abdomen is elongate, rather narrow in males and wider in females; the Ist and IInd, and the IIIrd to VIIth tergites are fused, and in females the VIIIth is also fused with the VIIth; in both sexes the scent gland scars are present between tergites IV and V and between tergites V and VI; the segmentation of connexivum is complete and extends from the IInd to the VIIth tergite. Sternites well developed, the IInd to the IVth fused in the female and IInd to Vth in males. Three trichobothria (tr. fig.2,11) are present on sternites III to VI and two on the VIIth; those of the IIIrd and IVth sternites are located ventrally, close to the median line of abdomen; on the sternites V to VII the trichobothria are more dorsal, close and behind the spiracles; in the males the tergite VII is rounded posteriorly, covering the genital capsule from above, and the VIIth sternite is concave, laterally covering the basal half of the ventral and lateral sides of genital capsule (fig. 2); in females the VIIth sternite has a median cleft. In males the VIIIth segment is ring like, with dorsal surface membranous, without spiracle, and retracted within the VIIth segment; it overlaps

the basal half of the genital capsule, In females the VIIIth and IXth segments are represented by the tergites and laterotergites VIIIth and IXth respectively, and the gonocoxae and gonapophyses of the ovipositor (fig. 11).

(Pl. 2-3)

Male genitalia.-The genital apparatus is placed entirely within the genital cavity (gca. fig. 3) of the genital capsule (gc. fig. 2,10) which opens postero-dorsally. The genital capsule represents the modified IXth abdominal segment. It is complete and well sclerotized laterally and ventrally; the anterior and lateral parts of the dorsal surface of the capsule are also sclerotized, and the central portion membranous (genital membrane, gm. fig. 3) and extended posteriorly into proctiger (pr. fig. 3,4) (= anal cone), invaginated part of which bears two slightly sclerotized areas which may represent rudiments of the XI abdominal segment; on each side at base of proctiger there are two elongate convex sclerites which probably represent the Xth tergite; the lateral margins of the capsule (lmg. fig.3) differ considerably in shape, usually they project dorso posteriorly to greater or lesser degree or are flared and medially inflected into the genital cavity. The details of conditions of the lateral margins are of taxonomic value. The parameres (pa. fig. 3,4) are connected by means of a narrow membrane with the inflected portion of the lateral margins; the shape of posterior margin and its level in relation to the lateral margins also provide taxonomically important characters. The posterior margin is also inflected towards the

genital cavity forming a large broad floor (b. fig. 3,4) which reaches almost up to halfway down the posterior wall of the capsule; the internal margin of this inflected area forms a transverse ventral ridge, which extends laterally and strengthens internally the capsule; this transverse ridge is variable in shape and occasionally bears a median posteriorly directed process, and also is anteriorly projected at the level of the lateral margins of the inflection (b), into a pair of large, thin, laminated structures which are firmly fused with the inner surface of the capsule; these structures are the suspensory apodemes (sa. fig. 4) which provide support and movable pivoting articulation for the phallus. The phallus (ph. fig. 4) is divided into two main parts; the phallotheca and the conjunctiva. The phallotheca (phl. fig. 4,7,9) consists essentially of a cup-shaped portion, heavily sclerotized and rugose on its ventral surface; dorsally it is usually membranous and laterally usually slightly to weakly sclerotized. The distal region of phallotheca is continuous with the conjuctiva without a clear cut boundary between them, although the dorsal fold (df. fig. 4,9,10) or processes 14a-b (fig. 7) indicate the distal limit of phallotheca. When the phallus is not erected, it occupies a vertical position, the conjunctiva is withdrawn into the phallotheca and the distal portion of conjunctiva is also partially retracted into the conjunctiva itself. In this withdrawn condition the opening of the phallotheca is then closed either by the dorsal fold or laterally by the processes 14a-b; some species have long process 5a which remains partially projected from the phallotheca.

At erection the phallus turns backwards until the ventral surface of the phallotheca rests on the floor of the capsule; then the conjunctiva is evaginated by the injection of fluid into the lumen of the phallus causing the evertion and turgidity of the conjunctiva. Attached to the base of the phallus is the sclerotized phallobase (phb. fig. 4,9) by which the phallus articulates with the capsule and gives the points of insertion for the phallic musculature; the phallobase has the shape of an inverted stirrup, the stapes (sta. fig. 8) with a transverse dorsal bridge, the transverse bridge (tb. fig. 8), joining its two arms; at this junction the phallobase gives articulation to the suspensory plates (spl. fig. 4,8,9) and also to the tip of the suspensory appodemes of the capsule. The phallobase bears medially a ring like sclerite, the ductifer (du. fig. 4,8,9) which serves as point of entry of the ejaculatory duct into the lumen of the phallus; it also supports the erection pump (ep. fig. 4,9), which injects into the phallus the fluid necessary for the inflation of the conjunctiva and also maintains the pressure during the erection of the phallus.

The transverse bridge of the phallobase is connected to the inner ventral surface of the proctiger by a fine membrane; this membrane may be expanded antero-dorsally and form the subproctigeral sac (sps. fig. 4), in which the most distal portion of the process 5a is located when the phallus is at rest.

The conjunctiva (cj. fig. 10) is entirely membranous although some of its processes may be wholly or partially sclerotized; the

number and development of these processes is variable in the tribe and their actual conditions are of high taxonomic value at specific and generic levels. The conjunctiva bears dorsally a dorsal sac (ds. fig. 7,9,10) variable in shape and size, armed with a number of processes which are numbered as indicated in figs. 7 and 9; of these the processes 8a-b and 5a are always present; the process 5a (= helical process) is coiled and heavily sclerotized and between its convolutions there is located a narrow coiled, strongly sclerotized duct, which represents the external portion of the ductus seminis; no vesica is present except for a small membranous portion at base of the ductus seminis and between the bases of processes 5a and 5b. The ductus seminis (= endophallus) (dcs. fig. 9) runs through the lumen of the phallus, as a continuation of the ejaculatory duct, from the inner side of the ductifer to the ejaculatory reservoir (ejr. fig. 7,9) from the apex of the body of the latter it becomes an external estructure running through the convolutions of process 5a. The ejaculatory reservoir is located at the distal portion of the conjunctiva and is heavily sclerotized, greatly subdivided and asymmetric. Below the internal portion of the ductus seminis, and extending from the inner tips of the ductifer to the antero-ventral surface of the "body" of the ejaculatory reservoir, there is a tendon-like hyaline band (hb. fig. 9) which protects the delicate and fragile ductus seminis, and also limits the extent of the phallus.

The parameres are suspended from the inflected lateral margins of the genital capsule and are attached to the latter by a membrane

which is part of the genital membrane; the paramere usually has a broad base and a thick shaft (sf. fig. 5,6) which becomes narrower distally to form the shank (sh. fig. 5,6); the latter is variable in length and shape and may have a median lobe (ml. 5,6) or ends in the hook (hk. fig. 5,6); on the outer surface of the shaft and lateral to the base of shank there may be present an outer lobe (ol. fig. 5,6) (= inner basal lobe, Allen, 1969); between the latter (if present) and the shank there is usually a distinct distal cavity (dc. fig. 5).

Female genitalia: The female genitalia are of the so-called plate-shaped type. They consist of one pair of Ist gonocoxae (= valvifer) (I gcx. fig. 11,12), one pair of Ist gonapophyses (= valvula) (I gap. fig. 12) which are associated with the VIIIth laterotergite, and one pair of IInd gonocoxae (II gcx. fig. 11,12) and one pair of IInd gonapophyses (II gap. fig. 11,12) associated with the IXth laterotergite. The Ist gonocoxa is broad, subtriangular and is connected with the VIIIth laterotergite by a membrane. The Ist gonapophysis is flat and elongate, with numerous papillae like lobes; it is connected by a membrane to the ventral anterior margin of the Ist gonocoxa. The dorsal margin of Ist gonapophyses connected with the gonangulum located at the VIIIth laterotergite (VIII lt. fig. 11,12), by means of dorsally bend Ist ramus (I rm. fig. 12) which joins the gonangulum near the middle of the medial side of the Ist gonocoxa. The VIII laterotergite is usually trapezoidal and bears a spiracle (spi. fig. 2,11). The IInd gonocoxa is elongate rather narrow and is articulated directly to the IXth laterotergite

(IX lt. fig. 11,12) which surrounds the proctiger (pr. fig. 11,12) and carries no spiracle. The ventral margin of the IInd gonocoxa is connected to the IInd gonapophysis by the IInd ramus (IInd rm. fig.12). The IInd gonapophysis is elongated and slightly concave medially. The IXth laterotergite is articulated with the gonangulum and at its antero ventral margin has a strong spur which articulates with a small notch on the dorsal margin of the IInd gonocoxa. The Ist and the IInd ramus are interlocked together along their entire length, and thus complete the connection between the two sets of apendages (gonocoxa and gonapophyses).

Surrounded by the two sets of gonocoxae and gonapophysis is the genital chamber (gch. fig. 12), limited dorsally and laterally by the epithelial wall (epw. fig. 12) of the genital chamber; anteriorly it opens into the oviduct (ov. fig. 12) and antero dorsally bears the spermatheca. The spermatheca essentially is a membranous tubular organ which opens into the genital chamber. The base of spermatheca is variable in shape and size and is followed by the spermathecal duct (sd. fig. 12,13) variable in shape, length and width which are correlated with the size of the process 5a of conjunctiva. The spermathecal duct may have a large and wide duct dilation (dd. fig. 13) near the proximal flange (pf. fig. 13) of the spermathecal pump (sp. fig. 13); the distal most portion of the spermatheca is formed by a sclerotized, very narrow and strongly coiled portion (col. fig. 13) which leads to the strongly sclerotized spermathecal bulb (sb. fig.13).

KEY TO LETTERING OF FIGURES OF THE MORPHOLOGY

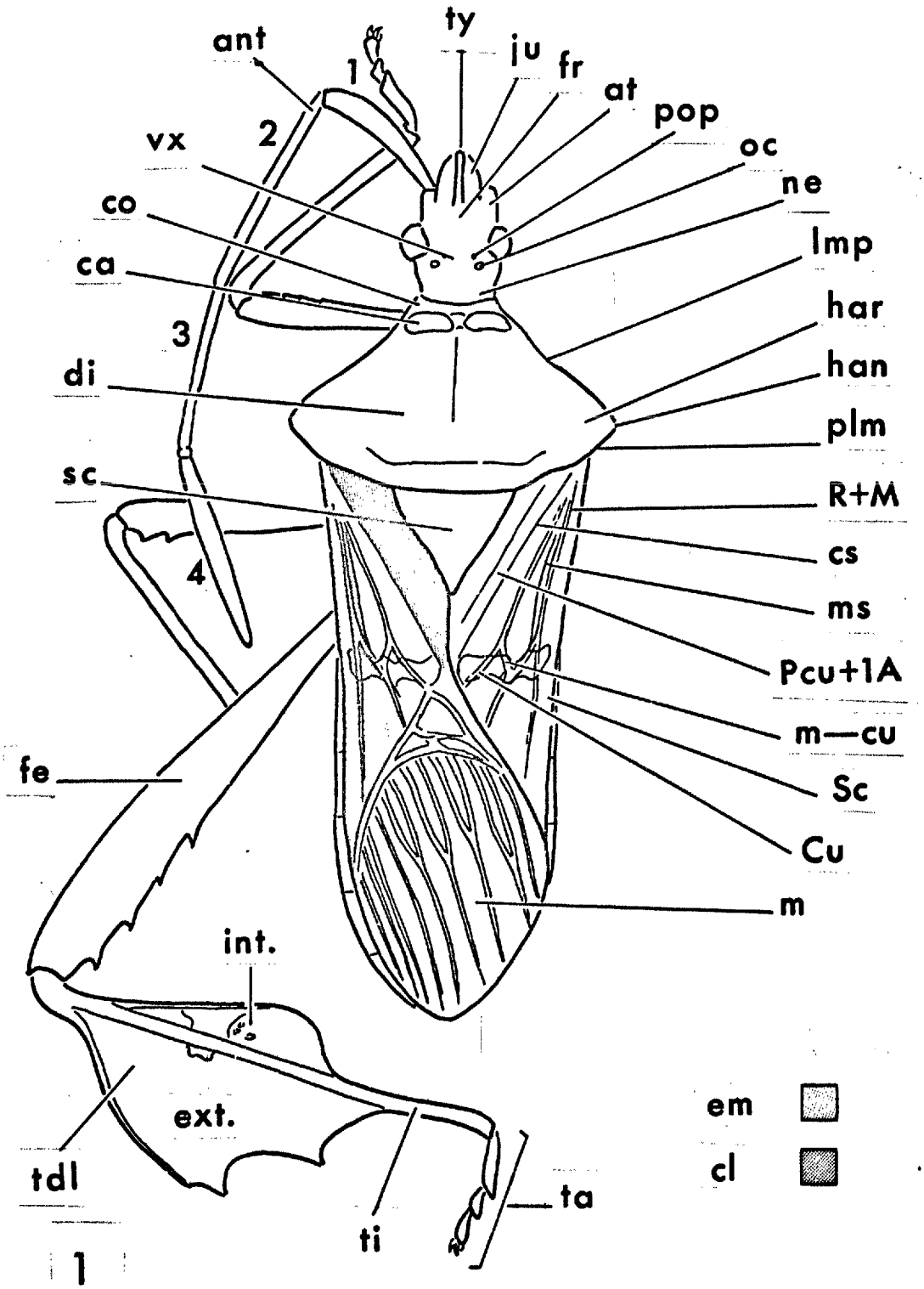
ant. = antenna
at. = antenniferous tubercle
bu. = buccula
ca. = calli
cc. = coxal cleft
cj. = conjunctiva
cl. = clavus
co. = collar
col. = coiled portion of spermathecal duct
cor. = corium
cs. = claval suture
Cu. = Cubital vein
dc. = distal cavity of paramere
dcs. = ductus seminis
dd. = duct dilation of spermatheca
di. = disk of pronotum
df. = dorsal fold of conjunctiva
dp. = dorsal prongs of genital capsule
ds. = dorsal sac of conjunctiva
du. = ductifer
ea. = evaporative area
em. = embolium
ep. = erection pump
epw. = epithelial wall
ext. = external dilation of hind tibia
ey. = eye
ejr. = ejaculatory reservoir
fe. = femur
fr. = front
gap. = gonapophysis I,II
gc. = genital capsule
gca. = genital cavity

gch. = genital chamber
ge. = gena
gm. = genital membrane
gu. = gula
gcx. = gonocoxa I,II
han. = humeral angle
har. = humeral area
hb. = hyaline band of phallus
hk. = hook of paramere
int. = internal dilation of hind tibia
ju. = jugum
la. = labium
lmg. = lateral margin of genital capsule
lmp. = lateral margin of pronotum
lt. = laterotergite VIII, IX
m. = membrane hemelytra
m-cu. = medial cubital cross vein
ma. = maxillary plate
ml. = median lobe of paramere
mn. = median notch of genital capsule
ms. = median suture of corium
ne. = neck
oc. = ocelli
ol, = outer lobe of paramere
ov. = oviduct
Pcu + 1A = Post cubital + 1 Anal vein
p. = prong of genital capsule
pa. = paramere
pb. = precoxal bridge
pc. = pleural callus
pe. = peritreme
pef. = postepimeral flange I, II, III
pf. = proximal flange of spermatheca

ph. = phallus
phb. = phallobase
phl. = phallotheca
pl. = pleura
plm. = postero lateral margin
pm. = posterior margin of genital capsule
pop. = preocelar pit
pr. = proctiger
R + M = Radial + Medial vein
rm. = ramus I, II
sa. = suspensory apodeme
Sc. = Sub costa vein
sb. = spermathecal bulb
sc. = scutellum
sd. = spermathecal duct
sf. = shaft of paramere
sh. = shank of paramere
sl. = supracoxal lobes I, II, III
sp. = spermathecal pump
spi. = spiracle
spl. = suspensory plate
sps. = subproctigeral sac
sta. = stapes of phallobase
ta. = tarsus
tb. = transverse bridge of the phallobase
tdl. = tibial dilation
ti. = tibia
tr. = trichobothria
ty. = tylus
vx. = vertex

PLATE 1. - Figs. 1 and 2, Dorsal and lateral view of *Veneza zonata* (♂)

Plate 1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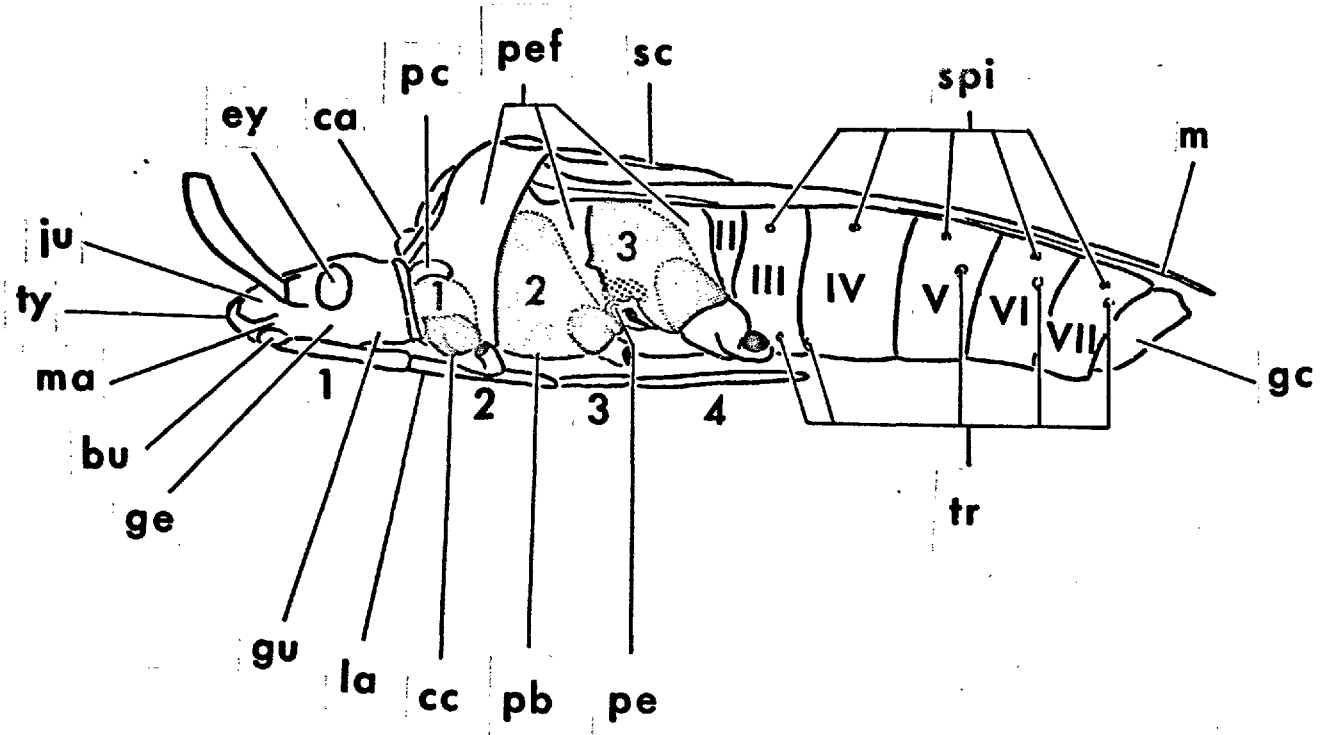
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Explanation of figures on Plate 2

Fig. 3 Dorsal view of genital capsule.

Fig. 4 Latero-internal view of genital capsule, showing the phallus.

Fig. 5 Internal view of the paramere.

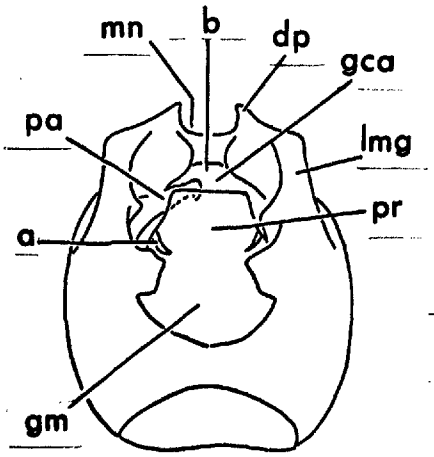
Fig. 6 Dorsal view of the paramere.

Fig. 7 Lateral view of a typical erected phallus of the Anisoscelis group of genera, showing disposition of its processes.

Fig. 8 Posterior view of phallobase.

Fig. 9 Lateral view of a typical erected phallus of the Leploglossus group of genera, showing disposition of its processes.

Plate 2



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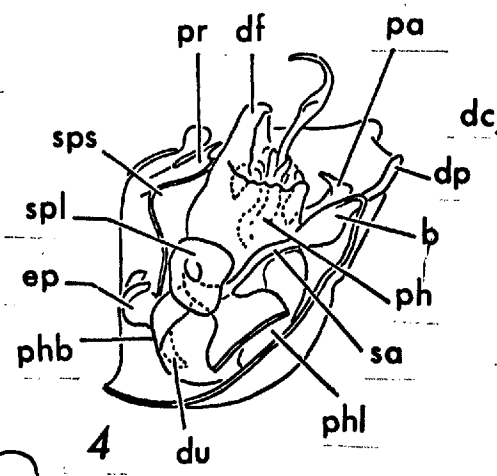

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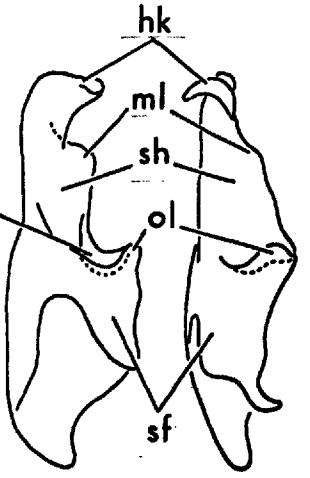

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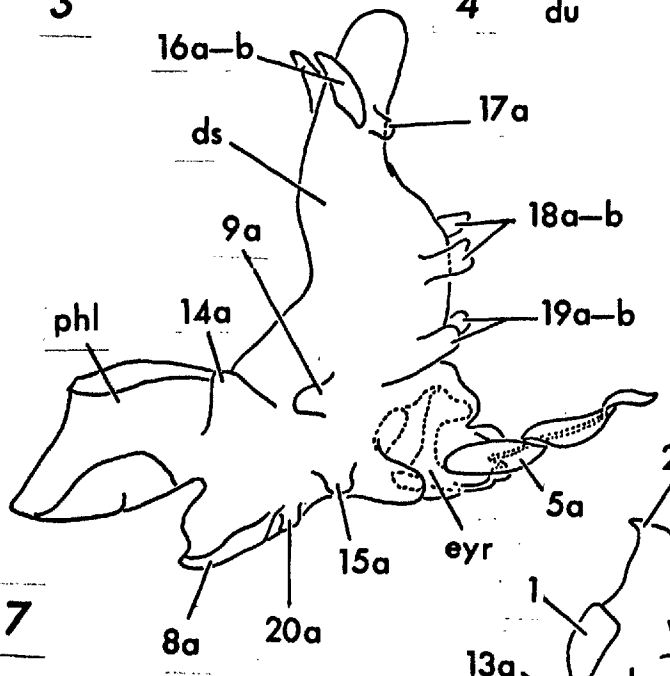

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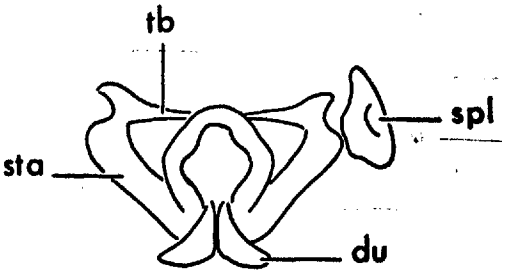

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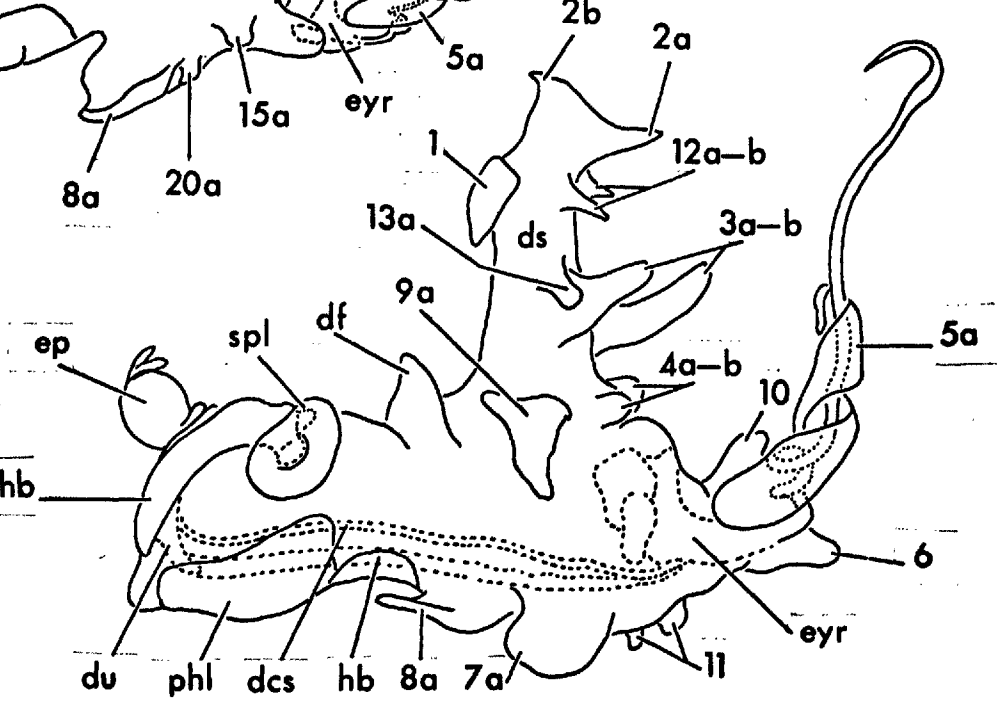

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Explanation of figures on Plate 3

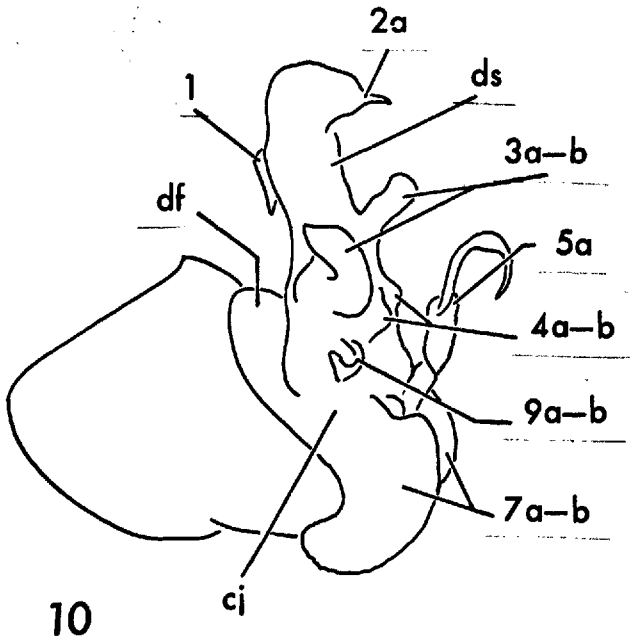
Fig. 10 Lateral view of an erected phallus of Veneza concolor, showing the inflated parts outside the capsule.

Fig. 11 Lateral view of the ovipositor.

Fig. 12 Ventral view of the ovipositor, showing the genital chamber and the distended appendages.

Fig. 13 Dorsal view of the spermatheca.

Plate 3



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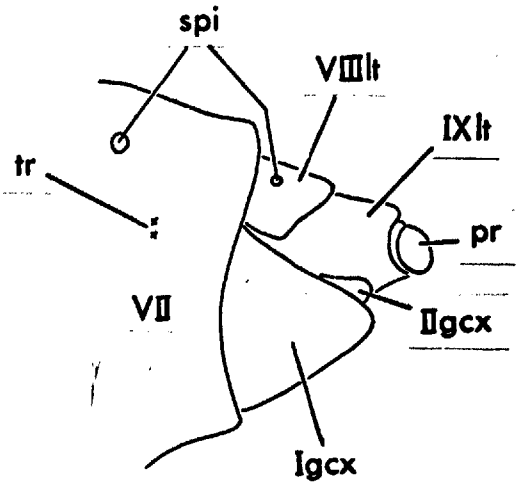

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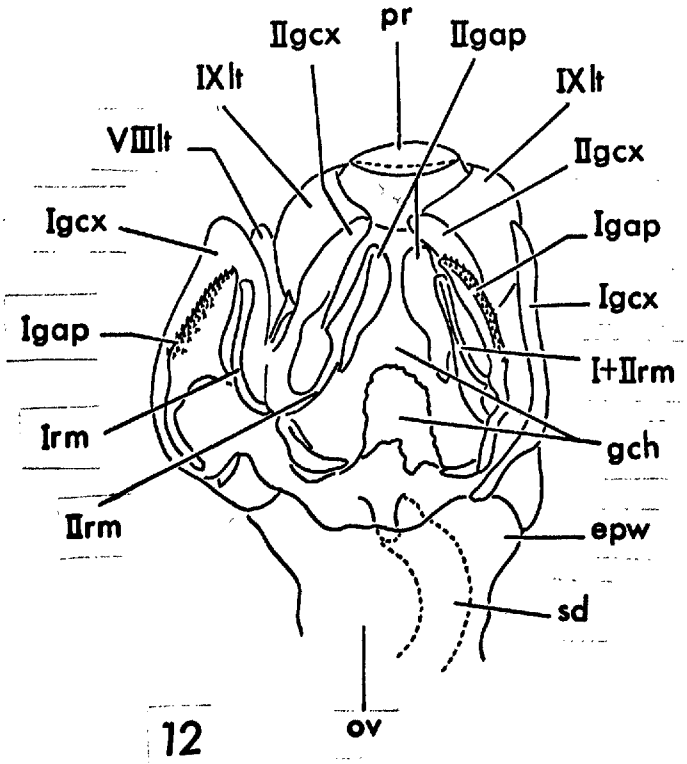

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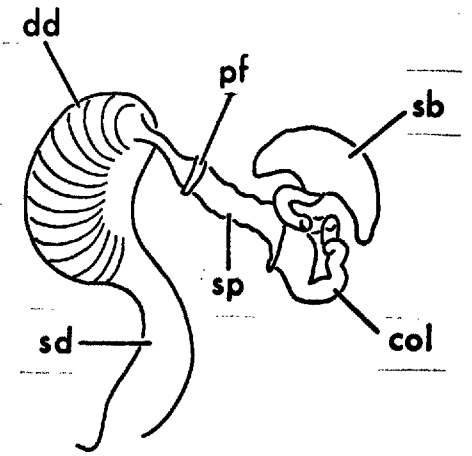

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TAXONOMY OF THE TRIBE ANISOSCELINI

Anisoscelini Amyot & Serville

Anisoscelides Amyot & Serville, 1873: 217

Anisosceloideae Spinola, 1850: 78

Anisoscelidida Stål 1867: 50

Anisoscelidina Stål 1870: 157

Anisoscelidae Lethierry & Severin, 1894: 44

Diagnosis: Small to large and robust species; body length not less than 11.0mm and not longer than 33.5mm. Head. Porrect, well prolonged anterior to antenniferous tubercles and with well developed neck; antenniferous tubercles usually small and not very conspicuous, almost as much separated from each other as the distance between ocelli, with the antennal socket directed antero-laterally; juga elongate, anteriorly almost reaching the tip of tylus and usually slightly bulging in the middle; tylus usually somewhat elevated above juga; buccula not extending beyond the level of antenniferous tubercles. 1st antennal segment long, slender, usually as long as the head, sometimes with some segments dilated; 1st segment shortest or as long as the IInd; IInd longer than IIIrd and equal or shorter than the IVth. Labium variable in length, 1st and IInd segment subequal, IIIrd shortest and the IVth variable but longer than the IIIrd. Thorax.- Pronotum subexagonal wider than long,

humeral areas sometimes laterally expanded, disk large, convex, declivent to different degrees in different genera and sometimes also in different species of the same genus; calli present, well differentiated from the disk. Hemelytra large extending beyond the apex of abdomen; corium sometimes transparent, membranous. Ventral surface of all femora armed with a number of spines arranged in two longitudinal rows, and the dorsal and lateral surfaces sometimes with small tubercles; hind femur variable in shape, usually gradually enlarged distally; hind tibia dilated, usually with dilations on both external and internal surfaces; the external dilation of different shapes and sizes and, with few exceptions wider.

Male genitalia: Genilal capsule usually narrowing posteriorly (figs. A,B)-posterior margin almost level with dorsal surface of the capsule, not produced posteriorly, sometimes with medium notch; lateral margins usually higher than the posterior margin. Phallus (figs. E,F)- phollotheca strongly sclerotized ventrally;with well developed dorsal sac of various shapes, armed with several membranous or sclerotized processes; processes 8 a-b moderately developed i.e. never four times the width of 1st convolutiou of process 5a (as in some Leptoscelini) nor markedly reduced to a tiny sclerotized protuberance (as found in Acanthocephalini); process 7a-b if present moderately developed; processes 9a-b if present in lateral or latero-dorsal position.

Discussion: Lethierry & Severin in their catologue of Coreidae included 10 genera in the Tribe Anisoscelini: Uranocoris (1 species), Holhymenia (5 species), Tarpeius (1 species) Baldus (1 species) Chondrocera (1 species), Anisoscelis (10 species) Diactor (1 species), Leptoglossus (35 species), Narnia (3 species) and Microphyllia (1 species). All these genera have been retained in Anisoscelini, except for the Indonesian genus Uranocoris which obviously does not belong to Anisoscelini and has been provisionally transferred to the tribe Homoeocerini. Four new genera Bitta, Stalifera, Fabrictilis and Veneza have been proposed for four different groups of closely related species, and the genus Theognis has been reerected as a valid genus. These 14 genera, can be divided into three major groups of genera: Anisoscelis group of 6 genera, Diactor group of 1 genus and Leptoglossus group of 7 genera, with 13 new species and 3 new subspecies here described. The number of species in the tribe Anisoscelini has been raised to the total of 72 species and 4 subspecies.

KEY TO GROUP OF GENERA AND TO GENUS DIACTOR

1 Genital capsule usually with subproctigeral sac; phallotheca with processes 14 a - b present; processes 9 a - b, when present, membranous; process 5a with three or more convolutions; duct of spermatheca not dilatated; eggs cupuliforms with rounded sides and corners. ..... Gr. gen. Anisoscelis (p. 44)

- Genital capsule without subproctigeral sac; phallotheca without processes 14 a - b, processes 9 a - b if present, normally sclerotized; processes 5 a with two convolutions; duct of spermatheca usually dilated; eggs not as above. 2

2 Phallotheca with dorsal fold; process 9 a - b flat, directed auteriorly usually sclerotized; tibial dilation lanceolate or folisceous usually emarginate and not brightly coloured, comparatively small; colour of the body usually brownish, exceptionally with few metallic areas; eggs subcylindrical with on side flat. ..... Gr. gen. Leptoglossus (p.243)

Phallotheca without dorsal fold; processes 9 a - b slender, swollen and bend anteriorly; tibial

dilation strongly dilated, undulated without emarginations, with bright colours; colour of the body dark yellow with wide areas metallic green; eggs cupuliforms large and with sharp corners.....

.....DIACTOR (p. 225)

Anisoscelis group of genera

Diagnosis: Head. Normally with spots and patches on dorsal and lateral surfaces; usually declivent and longer than wide; antenna usually with some segments foliaceous or with flat expansions, sometimes all segments cylindrical. Thorax. posterior margin usually with pronotal extensions; hind tibia (fig.I) with tibial dilation either only on the external surface and narrow, extending over most of tibial length, or on both external and internal surfaces, and usually wide and sinuous. Fore wings with spots and patches, occasionally transparent.

Male genitalia: Genital capsule (fig. A,B) - usually with subproctigeral sac; posterior margin notched, emarginate or depressed; lateral margins entire, not flared, sometimes sinuous. Parameres (figs. C,D) - shaft usually cylindrical, not twisted, and without distal cavity, sometimes compressed laterally; shank simple without median lobe or prominences, without hook and distal process; outer lobe present. Phallus: (fig. E) phallotheca dorsally and laterally sclerotized; processes 14 a-b present, without dorsal fold; processes 9 a-b when present, membranous usually prominent and apically flattened; processes 17 a-b, 18 a-b, 19 a-b, 15 a-b, and 16 a-b sometimes present;

processes 5a (fig. E,F) with three or more convolutions, occasionally the third one incomplete or widely open.

Female genitalia: Spermatheca tubular, sometimes swollen at base or near the base, without duct dilation; spermathecal bulb capitate or elongate.

Eggs: Cupuliform, with rounded sides and rounded corners; usually without carina; operculum central, small and oval.

KEY TO GENERA

1 Tibial dilation (fig.I) restricted only to the external surface of tibia, narrow, usually extending over almost the whole length of tibia, unicolourous; posterior margin of pronotum with pronotal extensions at the sides of scutellum; IVth antennal segment yellowish white; bulb of spermatheca elongate..... 2

- Tibial dilation on both external and internal surfaces of tibia, wide or very wide, sinuous, sometimes emarginate, usually multicoloured; posterior margin of pronotum, without pronotal extensions; IVth antennal segment not yellowish white; bulb of spermatheca capitate..... 4

2 (1) Fore wing transparent with very distinct dark brown venation; head and thorax usually black with yellowish whit patches and spots, except H. rubescens which has most of thorax and part of head orange brown; first three antennal segments black; segments II and III, both with flat expansions on anterior and posterior sides of the whole length of the main shaft; posterior margin of pronotum with conspicuous pronotal extensions at the sides of scutellum; the latter raised at base and apex with deep central depression, bounded laterally by short and thick marginal ridges..... HOLHYMENIA (p. 50)

\- Not with such combinations of characters..... 3

3 (2) Head and antenna cinnamon with brown markings; thorax and corium cinnamon with brown punctures; IInd antennal segment with narrow foliation on distal part of anterior side; IIIrd segment with wide foliations on both sides of main shaft; posterior margin of pronotum with inconspicuous pronotal extensions; scutellum flat, with long and thin marginal ridges; sternites cinnamon with brownish marks. ..... TARPEIUS (p.118)

- Head cinnamon with dark brown to black markings; first two antennal segments cinnamon, the IInd with brown apex; IIIrd brown; thorax dark red with yellowish white patches and spots; corium black with yellowish white spots; IInd antennal segment cylindrical and elongate; IIIrd segment foliaceous on both sides of the main shaft, forming together an oval foliation; posterior margin of pronotum with small pronotal extensions; scutellum with short shallow depression near the apex, bordered by short marginal ridges; sternites with anterior half of lateral margins and circumspiracular areas, yellowish white.....BALDUS (p.127)

4 (1) Antennal segments II and III with or without flat lateral expansions; tylus and juga above the level of antenniferous tubercles; lateral margins of pronotum slightly curved; humeral areas prominent, level with humeral angles; lobe 15 a-b of conjunctiva present; spermatheca short, medially swollen.....
.....CHONDROCERA (p.134)

- All antennal segments cylindrical; tylus and juga below the level of antenniferous tubercles;

lateral margins of pronotum not as above; processes 15 a-b absent; spermatheca comparatively long sometimes swollen at base..... 5

5 (4) Ist antennal segment less than twice as long as the head; pronotum and scutellum at least partially metallic green, occasionally metallic blue, except for one species and one subspecies in which it is pale brown to dark brown; lateral margins of pronotum straight; posterior margin slightly depressed; hind tibia (fig.I) with external dilation extending over most of tibia and tapering towards the apex; dorsal region of abdomen metallic green; ventral ridge of genital capsule "U" shaped; posterior surface of dorsal sac slightly sclerotized from its base to the bases of processes 16 1-b; Ist convolution of process 5a (fig. E.F) sinuous ANISOSCELIS (p.149)

- Ist antennal segment twice as long as the head; pronotum, scutellum and corium usually with yellowish white or yellow ochre markings on posterior margin of pronotum, lateral margins of scutellum and on veins of corium; lateral margins of pronotum slightly sinuous, posterior margin moderately depressed; hind tibia (fig.I) with external dilation comparatively short not

reaching the apex of tibia; dorsal region of abdomen brownish with mottled triangular lateral areas; ventral ridge of genital capsule with medial process; conjunctiva between processes 19 a-b and 16 a-b weakly sclerotized; Ist convolution of process 5 a (fig. E,F) not sinuate ..... BITTA (p.181)

HOLHYMENIA St. Farg. & Serville

(Plates 4-6)

Copium Thunberg. 1822:8. Type - species: Copium cornutum Thunberg. 1822, by monotypy. Junior synonym of Laccometopus clavicornis Linnaeus (Tingitidae, Heteroptera).

Copium Thunberg, 1825:8

Copium Thunberg: Stål. 1865: 180; 1867: 544; 1868:50.

Holhymenia Saint Fargeau & Serville, 1825: 61. Type-species: Holhymenia latreillei St. Farg. & Serville, 1825, by monotypy.

Holhymenia Saint Fargeau & Serville: Laporte, 1832:30.10.

Copius Burmeister, 1835: 329. [incorrect subsequent spelling.]

Holymenia Burmeister, 1835: 329, not. [unjustified emendation.]

Holymenia Burmeister: Stål, 1870: 157; Lethierry & Severin, 1894: 44.

Diagnosis: Medium to large elongate species. Head. Dorsal surface black or dark brown, generally with yellowish white markings; first three antennal segments black, the IIIrd usually with yellowish white markings, and the IVth yellowish white with black tip. Longer than wide, declivent deeply depressed.

behind the ocelli; tylus and juga below the level of antenniferous tubercles; Ist antennal segment longer than head; segments II and III, both with flat expansions on anterior and posterior sides of the whole length of the main shaft; length of labium variable but not reaching beyond the Vth sternite. Thorax. Basically black with yellowish white markings, but occasionally orange brown without markings (1 species). Pronotum declivent to slightly declivent and deeply punctated; calli indistinctly separated from each other, with different sculpture than the disk; lateral margins sinuous, slightly protruding, in some species tuberculate; humeral areas raised and deflected towards the horizontal humeral angles; posterolateral margins stright or slightly sinuous, entire; posterior margin abruptly depressed with conspicuous pronotal extensions; scutellum slender, without or with scanty punctuations, sometimes granulate, raised at base and apex with deep central depression bounded laterally by short and thick marginal ridges; antero-internal surface of apical half of femora of all legs armed with a row of 2 to 6 distally inclined spines, the spines gradually increasing in size towards the apex; and the postero-internal surface with one apical spine; hind tibiae (fig. I) with external dilation narrow and extending over most of the length of tibia, or prominent and restricted to the basal half of the tibia. Fore wing transparent scarcely punctate or not at all with

dark yellow to dark brown base, and very conspicuous dark brown veins on corium, clavus and on membrane. Abdomen. Circunspiracular areas and usually the lateral areas of IInd sternite yellowish white; segments VI and VII deflected in male and female.

Male genitalia: Genital capsule (fig. A,B) - with subproctigeral sac, and posterior and lateral margins compact and entire; ventral ridge gently curved, semioval. Paramere (fig. C,D) - shaft straight, shank simple, curved latero-postero-dorsally, and projecting very sharply from the main shaft.. Phallus (fig.E) with phallotheca dorsally and laterally very slightly sclerotized, processes 14 a-b slightly sclerotized, and conjuntiva armed with the following processes: 16 a-b heavily sclerotized and spinose, 15 a-b membranose, 8 a-b horizontal and flat, and often also with processes 9 a-b and 17 a-b; precess 5a (fig.E.F) slender, with three convolutions, usually with the third one strongly coiled, and followed by a long sinuous and curved tip.

Female genitia: Spermatheca (fig. H) tubular simple, with wide swollen base, without duct dilation; spermathecal bulb capitate.

Sculpture: Pronotum and pleural region with shiny and dull areas; the shiny areas are distributed as follows: On pronotum - humeral and lateral area, a median longitudiual band, and the calli. On propleural area - pleura, supracoxal

lobes, and dorsal half of postepimeral flange I; on mesopleura - pleura, supracoxal lobes, and posterior upper corner of postepimeral flange II; the whole metapleural area, except the evaporative area above and below the peritreme.

Pubescence. Body comparatively bare, with some microscopic hairs on head, some larger thin hairs on calli and disk of pronotum, and some very thin short hairs on the sternites, those on the posterior sternites more dense and slightly longer; posterior and lateral margins of genital capsule in males, and surface and margins of Ist gonocoxa in females with large thin hairs.

Geographical distribution: Only known from the Neotropical Region, ranging from the southern parts of Mexico to the northern part of Argentina, with one species present in Trinidad. It is most common and best represented in Brasil.

Discussion: Acording to Stål, 1870, the type-species of the genus Copium Thunberg, 1822 is Copium cornutum Thunberg, which is a junior subjective synonym of Laccometopus clavicornis Linnaeus now in Tingitidae. Copium remain available (Art. 17.1) but can only be reemployed if the synonymy is judged to be erroneous.

KEY TO SPECIES

1 Body basically orange brown without yellowish white markings; posterior half of head and tergites IV to VII black, shaft of paramere with inner depression and without dorsal ridge..... ..... rubescens (p.56)

- Body basically black, with yellowish - white markings; shaft of paramere without inner depression and with dorsal ridge 2

2 (1) Head with a triangular spot between the eyes; anterior patch extending over frons and tylus 3

- Not with such combination of characters 6

3 (2) Central pronotal spot in line with the lateral ones; basal spot of scutellum trapezoidal 4

- Central pronotal spot anterior to lateral ones; basal spot of scutellum triangular or subtriangular 5

4 (3) Spermatheca narrow and slender (fig. H)... rubiginosa(p.75)

- Spermatheca with swollen base and gradually becoming narrow towards the apex.(fig.H)--histrio(p.64)

5 (3) Basal spot of scutellum slender and subtriangular with incurved margins; central pronotal spot

subrectangular; lateral areas of IIIrd sternite yellowish white ..... persimilis (p. 78)

- Basal spot of scutellum triangular; central pronotal spot shield like; IIIrd sternite without yellowish white patch .....-tucumana (p.83)

6 (2) IIIrd antennal segment with yellowish white markings 7

- IIIrd antennal segment without markings 8

7 (6) IIIrd antennal segment with an oval apical spot; central longitudinal pronotal spot rectangular; interocular area with small subtriangular spot; external tibial dilation prominent distally ending in straight margin almost perpendicular to the shaft of tibia. (fig.I).... costalima (p.94)

- IIIrd antennal segment with long, wide distally and pointed proximally spot;interocular area without spot; central longitudinal pronotal spot lanceolate; external tibial dilation not very prominent, ending in lateral extension. (fig. I) ..... clavigera (p.103)

8 (6) Anterior patch of head extending over tylus; central and postero medial pronotal spot seperate;

scutellum with basal black trapezoidal spot.
..... vulsa (p.88)

- Anterior patch of head extending over frons, base of antenniferous tubercles, tylus and partially over bases and lateral surfaces of juga; central and postero medial pronotal spot joined, both forming an arrow like median longitudinal spot; scutellum with the basal $\frac{1}{4}$th and basal $\frac{2}{3}$rd of margins black. ;.....
..... scenica (p.111)

Holhymenia rubescens (Amyot & Serville),1843

(Plate 4)

Copius rubescens Amyot & Serville, 1843: 222, Pl.4, fig.8. Holotype , Brasil, (lost).

Copius rubescens Amyot & Serville: Dallas, 1852: 466.1; Walker, 1871: 153. 1.

Copium rubescens(Amyot & Serville) Stål, 1868: 50.

Holymenia rubescens (Amyot & Serville): Stål, 1870:157.1; Lethierry & Severin, 1894: 44.

General and differential diagnosis: The largest species of the genus (20.8 to 25.0 mm), differentiated from all the other species of the genus by orange brown general coloration, except the head, antennae, hind legs and posterior part of the abdomen, all partially black.

Description: Head. Anterior part orange brown; dorsal and genal areas from bases of antenniferous tubercles to the neck, as well as gula, black. Labium orange brown, with the tip of IVth segment black. First three antennal segments, apex and the whole ventral surface of IVth sement, black; most of the latter yellowish white. Tylus blunt, slightly longer than and not elevated above juga; the latter thick with rounded tips and curved median margin compressing the tylus laterally. Labium reaching the anterior margin of Vth sternite. Thorax. Orange brown dorsally, lighter ventrally and laterally; anterior, external and posterior surfaces of the dorsal half of fore tibia, apical ⅓rd of middle femur, basal ⅔rd of middle tibia, distal ¾th of hind femur and basal ⅔rd of hind tibia, black; distal end of hind tibia and hind tarsus, white. Base of corium dark yellow. Pronotum with an antero medial depression; calli raised, well differentiated from pronotal disk but fused with each other, slightly elevated above the collar; lateral margins of pronotum tuberculate; humeral angle obtuse; posterior extensions subtriangular, close to the sides of scutellum; the latter granulate. Hind legs considerably longer than the fore and middle legs. Hind tibia (fig.I), with an elongate external dilation extending over almost the whole length of tibia; corium transparent with dark yellow base. Abdomen. Tergites I to IV dark yellow, with

posterior margin of tergite III and posterior half of tergite IV, black; the following parts are blackish brown or black: tergites V and VI, central part of tergites VIII and IX in females, anal cone, the oblique broad band extending from lateral margins of sternite IV to the upper half of first gonocoxa in females, and to the posterior margin of the genital capsule in males; the following are white: scent gland scars, lateral areas of tergite VI, central area of connexivum of segments V and VI, lateral areas of tergite VII, sublateral and marginal areas of tergite VIII and IX in females, dorsal surface and lateral margin of genital capsule, circumspiracular areas, posterior margin of sternite IV, sternites V to VII, ventral half of Ist gonocoxa and the latero-tergites VIII and IX.

Male genitalia. Genital capsule (fig. A,B) - posterior margin slightly rounded and below the level of lateral margins; the latter somewhat sinuate gradually descending posteriorly then slightly raised beyond the level of bases of parameres and descending again towards the posterior margin. Paramere (fig.C.D) - with inner central depression, acute outer lobe, and shank gradually curved, with rounded, narrowly deflected apical edge. Phallus (fig. E): phallotheca slightly sclerotized dorsally and laterally, with processes 14 a-b raised, rounded and slightly sclerotized; conjunctiva with short dorsal sac, armed with the following processes: 16 a-b

heavily sclerotized and spinose, 17 a-b membranous and rounded, 9a-b membranous and flat, 15 a-b enlarged, and prominent, and 5a with IIIrd convolution tightly coiled.

Female genitalia: Ist gonocoxa and laterotergite VIII as shown in fig. G; spermatheca (fig. H) tubualar, with a large spermathecal duct, wide and curved at the base, narrow distally.

Geographical distribution: (Map 1) This species is distributed over the central and northern part of South America; the available material was collected in Brasil, Bolivia, Peru, Surinam and French Guiana.

Habitat and biology: The material studied was collected in rain forests during the following months: January, February March, May, June, July, September and December, which suggest that the adults are present throughout the whole year. During the dissections, only one female was found with developed eggs but unfortunately with no date of its collection on the label; the eggs are cupuliform, length, 2.09 mm, width, 1.48 mm.

Discussion: This species differs from the other species of the genus by the general orange brown coloration, but the following variations were observed: in one ♂ from Peru, the whole dorsal surface of the head was black; in a small series from Santarem, Brasil, the antenniferous tubercules and the area between them was dark brown; in

one ♂ from Brasil the black coloration at the basal half of fore tibia was absent; the basisternum of mesothorax may vary from cream to white. The shape and size of the genital capsule and parameres, the short dorsal sac, the shape, relative size and position of processes 16 a-b and 17 a-b, the shape and degree of development of processes 9 a-b and the shape and size of 5a, are characteristic for ♂♂ of this species. The shape of the Ist gonocoxa, and the ~~shape of the Ist gonocoxa, and the~~ shape and size of the spermathecal duet are characteristic of ♀♀ , although in one ♀ the curve "c" and the recurrent part of curve "b" was absent. The size and shape of the hind tibia and its external dilation are also specific characters easy to see and therefore of high practical value.

Material examined.

a) Type material: The holotype ♀ of Copius rubescens A.-S, is believed to be lost in the collection of the Museum National in Paris, but two females are present in one of the original boxes of the Amyot & Serville collection; one is labelled as collected in Cayene and the other has no label at all. No neotype is here designated because it is well defined, distinct and quite different from any other species of the genus Holhymenia; the stability of this taxon can therefore be maintained without a designated type.(Art. 75b of the International Code of Zoological Nomenclature).

b) Other material: BOLIVIA: Sta.Cruz, H.Rolle, 2♂ (TM). BRASIL: Pará, Signoret, 1♀ (NM); Amazonas, Taperinha, Taperinha, Santarem, - III - 1916, G. Hagmann, 3♀, (NM); Manicore, Rio Madeira, - XII - 1923, 1♀, (RNH); Amazonas, Stevens, 1♀ (NR); Amazonas sup. Olivenca, 2♀, (NR); Amazonas, Teffe, 1♀, (NR); Amazonas, Obidos, 1♂, 2♀ (NR); Pará, walker's catal., 1♂, (BMNH); Ega, 1♂, 2♀, (BMNH)?; Amazon, Manacapuru, - IX - 1923, S.Klages, 1♂ (CM); Chapada, Sept., 1♀, (M); Upper Rocana, N.Pará, VI-1918, S.Klages, 1♂, (CM); Santarem, V-VII - 1919, s.c., 1♂, 2♀ (CM); s.d. 1♂, (IZA). FRENCH GUIANA: 1899, R.Oberthür, 2♂, 2♀ (MNHN). PERU: Juanjui, 1♀ (TM); Juanjui, Rio Huallaga, 1935, Nagel, 2♀ (DEI); Iquitos, -I-1929, S. Roque, 1♀ (RNH); s.l.,-XII-1930, Klug, 2♀, (ZI); Pebas, 1♂ (BMNH).; Amazonas sup.,Pebas, 1♂, 4♀ (NR). SURINAM: Phedrabos, 20 - XII - 1964, D.C. Geijskes, 1♂ (RNH); Maroni, Anapaibo, 24-II-1963, Rigone, 1♂ (RNH).

c) Material without data: 1♀, 1895, G.Fallov, (MNHN); 1♀, labelled C.Van Voixen Coll. No.3480, (IRSNB).

Plate 4

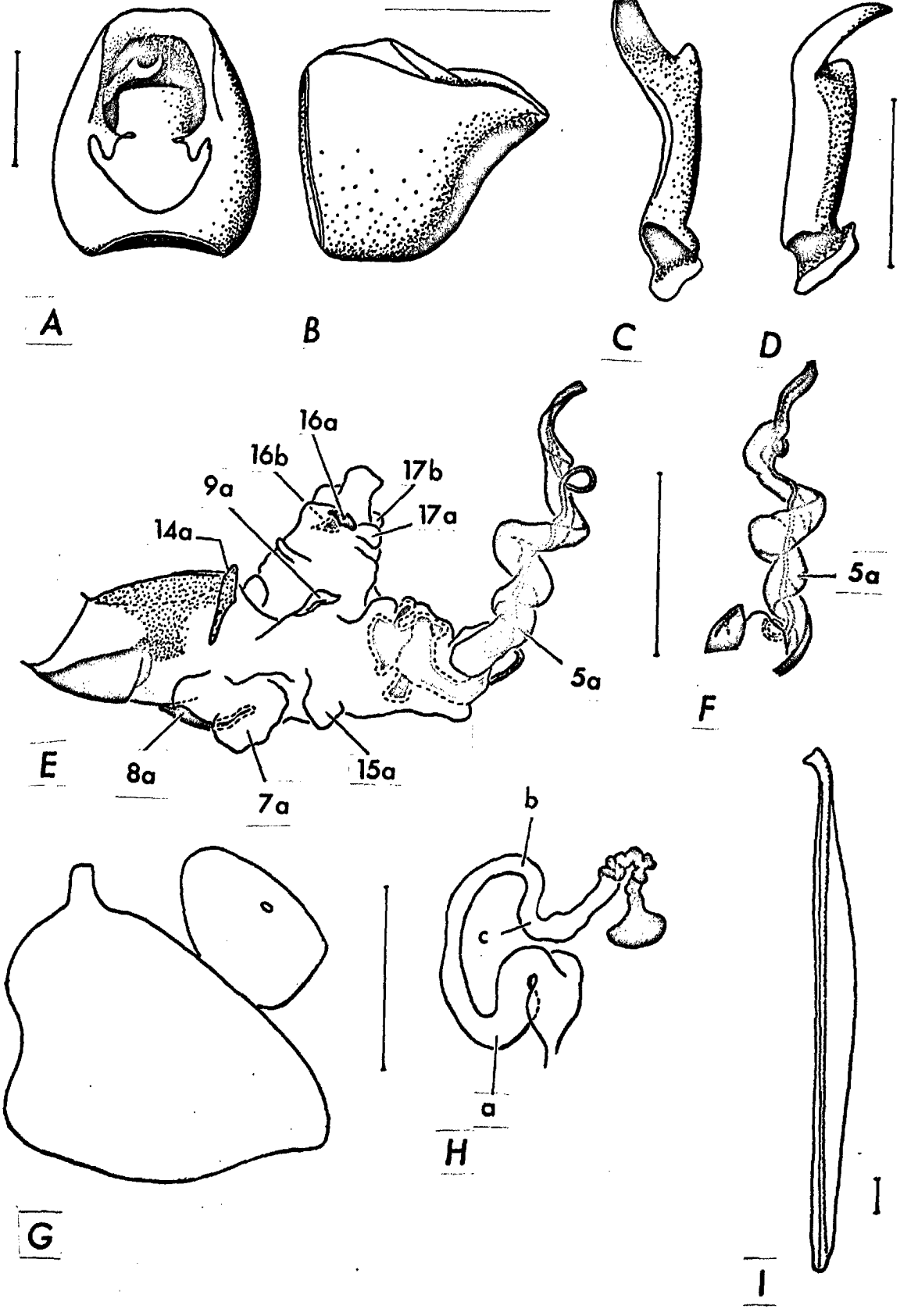


Table 1 Measurements (5 ♂♂ and 5 ♀♀ from 5 localities) in millimetres.

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	22.0-25.0	23.36	5	20.8-25.0	22.2
2 Head length	5	2.56-2.96	2.74	5	2.56-2.66	2.61
3 " width	5	2.69-2.83	2.75	5	2.56-2.73	2.61
Distance:						
4 inter-ocular	5	1.42-1.55	1.46	5	1.29-1.52	1.38
5 ante-ocular	5	0.98-1.33	1.15	5	1.06-1.15	1.10
Antennae:						
6 segm. I length	5	4.03-4.80	4.31	4	3.74-4.51	4.01
7 " II "	4	4.80-5.80	5.30	4	4.60-5.28	4.86
8 " III "	4	4.27-4.80	4.49	4	4.08-4.80	4.34
9 " IV "	2	6.48-7.20	6.84	2	5.85-6.00	5.92
Labium:						
10 segm. I length	5	3.04-3.51	3.24	5	3.04-3.60	3.21
11 " II "	5	2.91-3.40	3.14	4	3.21-3.42	3.29
12 " III "	5	1.78-2.18	1.95	4	1.90-2.31	2.08
13 " IV "	5	4.12-5.14	4.71	4	4.29-5.20	4.71
14 Pronotum length	5	3.84-4.12	3.93	5	3.45-4.08	3.65
15 " width	5	4.80-5.56	5.14	5	4.41-5.37	4.85
16 Scutellum length	5	2.39-3.06	2.69	5	2.26-2.66	2.37
17 " width	5	1.84-2.47	1.99	5	1.69-1.90	9.21
18 Hind tibia length	5	12.48-14.78	13.80	5	11.95-14.49	13.01
Tibial dilation:						
19 total width	5	0.80-1.00	0.90	5	0.84-1.15	0.95
external part:						
20 length	5	11.04-12.96	12.19	5	10.56-12.96	11.62
21 width	5	0.48-0.62	0.56	5	0.52-0.84	0.69
Ratios: (figures refer to character numbers above).						
1 / 2	5	8.24-8.90:1	8.52:1	5	7.81-9.61:1	8.51:1
1 / 18	5	1.60-1.82:1	1.44:1	5	1.59-1.77:1	1.70:1
2 / 3	5	0.93-1.06:1	0.99:1	5	0.95-1.03:1	1.00:1
6 / 2	5	1.42-1.74:1	1.57:1	4	1.03-1.73:1	1.53:1
10 / 2	5	1.14-1.22:1	1.18:1	4	1.16-1.40:1	1.22:1
9 / 6	2	1.55-1.78:1	1.58:1	2	1.56-1.60:1	1.46:1
15 / 16 %	5	1.75-2.81:1	1.91:1	5	1.53-2.55:1	2.04:1
20 / 18 %	5	86.83-90.94	88.33	5	87.78-92.48	89.31

Holhymenia histrio (Fabricius). 1803

(Plate 5)

Alydius histrio Fabricius. 1803: 248.2 LECTOTYPE ♂ Venezuela (Locality here restricted). (UZM), here designated [examined, dissected].

Copium guttatum Thunberg, 1825: 10.4. Holotype ♂ South America (ZIU) [examined]. Syn.n.

Copius histrio (Fabricius): Burmeister, 1835: 330.1; Dallas, 1852: 467.3; Walker, 1871: 153.1

Copius scurra Burmeister 1835: 330.3. Holotype Surinam (ZIH)? [Synonymized by Stal. 1868: 50].

Copium histrio (Fabricius): Stål, 1868: 50.1

Holymenia histrio (Fabricius): Stål. 1870: 157.4; Lethierry & Severin, 1894: 44

Stoll, Pun. pl.41, fig.294

General and differential diagnosis: Oval or rounded central spot on pronotum, situated in line with the lateral spots, i.e. all three are equidistants from the level of calli; posterior pronotal extensions narrow, tongue like or subtriangular, well separated from the base of scutellum. Characteristic features of ♂♂: the shape and size of genital capsule and parameres; the bulging dorsal sac; the shape, relative sizes

and position of processes 16a-b and 17a-b; the shape and degree of development of processes 9a-b; and the shape and size of process 5a. Those of ♀♀: the shape of 1st gonocoxa and the shape and size of spermatheca.

H. histrio shows close relationships with H. rubiginosa, H. persimilis H. tucumana; the relationships between these four species is indicated by the sharing of a triangular yellowish white spot between the eyes. (see differential diagnosis of these three species).

Description: Head.- Dorsal surface black, with the following yellowish white markings: triangular spot between the eyes, anterior patch covering frons and tylus, anterior and lateral surfaces of juga and anterior half of neck. Ventral and lateral surfaces and labium also yellowish white, with the following black parts: antenniferous tubercles, an elongate spot below the latter, area posterior and below the eye, ventral margin of juga, and ventral most portion of tylus. First three autennal segments and apex of IVth dark brown to black; most of the IVth segment, yellowish white. Tylus deflected, longer than, and slightly elevated above juga; the latter converging auteriorly, with obtuse tips and straight median margin. Labium reaching the Vth sternite. Thorax.- Pronotum, pleural region and prosternum basically black, with the following yellowish white markings: On pronotum - calli, three rounded spots placed in straight transverse line, elongate postero median spot, humeral angles and postero lateral margins. On propleural area - pleura, supracoxal lobes, pleural callus, infrahumeral area and a wide patch on the postepimeral flange I. On mesopleura - two dorsal rounded spots,

and a large central patch which extends over the supracoxal lobes and partially over the postepimeral flange II. On metapleura - peritreme, anterior and posterior surfaces of supracoxal lobe, postepimeral flange III, an oblique elongate spot in the upper half of the pleura and another elongate spot at the upper anterior corner of the pleura. On prosternum - a single medium patch; mesosternum laterally brownish, with median band yellowish white; metasternum yellowish white. Scutellum yellowish white with a trabezoidal spot at base and ridged parts of lateral margins dull black. All legs basically cinnamon: Fore leg - external and posterior surfaces of coxa yellowish white, and the external apical half of femur brownish. Middle leg - coxa orange brown to orange, with the posterior surface yellowish white; femur with apical 2/3rd orange brown; the base of tibia dark brown to black. Hind leg - coxa orange brown to orange; trochanter and distal 2/3rd of femur orange brown; base of tibia dark brown to black. Forewing without punctures; base of corium dark brown with circular yellowish white spot. Pronotal calli slightly elevated; anterior half of lateval margins of pronotum, with small tubercles gradually decreasing in size posteriorly; humeral angles obtuse; posterior extensions well separated from the base of scutellum, these extensions may be narrow, tongue like or subtriangular with blunt tips. Scutellum without punctures. Hind legs longer than fore and middle legs, hind tibia (fig. I) with long, and narrow, not very conspicuous external dilation, extending almost over the whole length of tibia. Abdomen.-Tergites ochraceous orange to vinnaceous rufous, with darker median band and almost the whole length of posterior margins of tergites III to VI;

1st tergite dark brown to black, posterior margin and connexiuum of IInd tergite dark brown; connexivum of the remaining segments, reddish brown, becoming paler on posterior segments. Sternites, 1st gonocoxa and laterotergite in females and genital capsule in males, orange brown to reddish orange; lateral marginal areas of sternites III to VII, darker; lateral areas of IInd sternite, an elongate patch at the autero-lateral margin of IIIrd sternite, circumspiracular areas, and usually the posterior margins of sternites III to VI, yellowish white.

Male genitalia: Genital capsule (fig. A,B) - posterior margin broad and straight, below the level of lateral margins; the latter straight and descending towards the posterior margin. Parameres (fig. C.D) - outer lobe obtuse and at the outer side distinctly delimited by a deep notch; shank gradually curved, flat, slightly wider at the apex than at the base, and with rounded apical edge. Phallus (fig. E): phallotheca dorsally and laterally very slightly sclerotized with processes 14a-b rounded, protruding laterally and slightly sclerotized; conjunctiva with large bulging dorsal sac; armed with the following processes: 16a-b heavily sclerotized and spinose, 17a-b membranous and inconspicuous, 9a-b membranous small and flat, 15a-b enlarged and very conspicuous, 8a-b narrow and sinuate with acute tip, 5a (fig. E.F) with the third convolution tightly coiled.

Female genitalia: 1st gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular, with a large and curved spermathecal duct, the latter wide, strongly curved at the base, becoming

narrow towards the apex.

Measurements and Ratios: (See table 2)

Geographical distribution: (Map 2) In the north the range of this species extends into the southern part of Mexico and in the south into the northern part of Argentina, but it seems to be more frequent in Brazil. The material available for this study was collected in: Mexico, Panama, Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, Brazil, Peru, Bolivia, Paraguay and Argentina.

Habitat and Biology: Collection data indicate that this species occurs in various ecological zones, varying from dry forests to rain forest; particularly in Venezuela it has been found in: Tropical dry forest, Premontane dry forest, Tropical moist forest, and Premontane wet forest. The frequency of adults collected did not vary appreciably throughout the whole year, and the developed eggs were found in dissected females captured in January, April (two observations) and in October. ♂ H. histrio has been reported by Da Costa Lima as occurring on Passiflora spp; in the records of the IZA it is registered as sporadic pest, feeding on fruits of Passiflora edulis (Parchita maracuya) and Passiflora quadrangularis (Parcha granadina). One female from Monagas, Venezuela, was observed with an egg of a Tachinid (Diptera), possibly Trichopoda pennipes Fabr., deposited on the prothoraxic suprocoxal lobe.

Discussion: The most important variation observed in the examined material were as follow: the usually black colouration of the thorax

may be dark brown; the prothoracic median spots may be joined together either by a very fine median yellowish white line or by a band, in the latter case forming a single longtitudinal median patch; the sizes of the prothoracic spots may be considerably reduced; the yellowish white spot on the posterior lateral margin is sometimes absent; prosternum may be completely black and mesosternum brown; in some ♂♂ the posterior margin of the genital capsule was somewhat depressed medially and in some ♀♀ variations in the degree of curvature of curves "b" and "c" were observed.

Material examined.

a) Type material: Alydus histrio Fabr. 3 ♂♂ syutypes: two of these, both labelled "Alydus histrio Fabr., type, Amer. merid. Schmidl, Mus. da Sehestedt" are in UZM (Copenhagen Collection) and in the course of this study, one of them was designated and labelled as lectotype, and the other as paralectotype; the third specimen in UZM (Kiel Collection), labelled simply "histrio", apparently belonging also to the "type series" (Zimsen, E. 1964) was designated as another paralectotype.

The type locality originally quoted as "America meridionalis" is here restricted to Venezuela, Aragua.

Copium guttatum Thumb, represented by the ♂ holotype, labelled "Amer. merid." and preserved in ZIU collection, has been considered since Stål. 1870 a synonym of H. clavigera Herbst. Examination of this specimen revealed that it is identical with H. histrio and is here formally synonymized with that species.

b) Other Material: ANTILLAS: Trinidad, 1914, P. Sarre, 6 ♂, 6♀, MNHN; Tacarigua, 14 - VIII - 1953, G.F. Mees, 1 ♂ (RNH); Trinidad, Brancsik, 1 ♀ (TM); Trinidad, -x- 1929, -vi- 1930, R.A. Lever, 1 ♂ (CM). ARGENTINA: Misiones, Loreto, 10 - x - 1928. A. Oglobin, 3 ♂, 1 ♀ (ZI); Posadas - VI - 1900, Silvestri, 1 ♀ (TM); Prov. Jujuy, 28 - II - 1955, J. Foerster, 1 ♀ (ZSBS) Misiones, F.P. Jowett, 1 ♀ (BMNH); 1 ♀ (MLP); Misiones, Pindapoy, - x - 1935, 1 ♂, 1 ♀ (MLP); Misiones, Pte. Bemberg, - II - 1942, 1 ♂ (MLP); Misiones, Loreto, - iv - 1936, 1 ♂ (MLP); Corrientes, 1 ♀ (MLP); Misiones Pindapoy, - x - 1935, 1 ♀ (IZA); Prov. de Paraná, San Ignacio, 1941, E.R. Wagner, 1 ♀ (MNHN); Posadas, 6 - III - 1909, Jorg., Jensen-Haarup Coll., 1 ♀ (UMZ). BOLIVIA: P. del Salá, - x - 1913, Steinbach, 1 ♀ (CM); J. Steinback, 1 ♂, 1 ♀ (BMNH). Brasil: 1 ♀ (UZM); F. Santo, 1♀ (NR); Amazon inf, Obidos, 1 ♀ (NR); Rio Grande do Sul, 1 ♂ (NR); Nedse, Rio Negro, 14 - xi - 1923, Melin, 1 ♂ (ZIU); Pará, Rio Trombetas, E. le Moult, 1 ♂ (RNH), Mendes, s.c., 1 ♀ (RNH); Santarem, s.c., 4 ♂, 1 ♀ (RNH); Botafogo, C. Van Voixen Coll., 1♀ (IRSNB); Manaos, Reserve Ducke, 20 - x - 1963, G. Marlier, 3 ♂, 1 ♀ (IRSNB); Rio Grande do Sul, 1 ♀ (RNH); Nova Teutonia, Rio Grande do Sul, 1 ♂ (RNH); Sta Catherine, 1 ♀ (MNHN); 1895, G. Fallow,4 ♂, 1 ♀ (MNHN); Esp. Santo, 1 ♀ (TM); 1 ♀ (TM); Bahia, Signoret, 1 ♀ (NM); s.l., ex Coll. Fruhstorfer, 2 ♂, 3 ♀ (NM); Nutterer, 2 ♀ (NM); Amazonas, Taperinha, Santarem, - III - 1916, G. Hagmann, 1 ♂, 2 ♀ (NM); Nova Teutonia, 9 - IV - 1943, F. Plaumann, 1 ♂ (ZSBS); St. Catarina, - VIII - 1932 - I - 1933, A. Johnk, 1 ♀ (ZSBS); 1 ♂, 2 ♀ (ZSBS); St. Catarina, 20 - III - 1934, F. Hoffman, 1 ♀ (DEI); Sao Paulo, 24 - II - 1934,

Masa, 1 ♀ (DEI); Espirito Santo, Breddin Coll., 1 ♂, 1 ♀ (DEI); 1 ♀ (ZI); Sao Paulo, 1 ♂ (ZI); Rio Grande do Sul, Cruz Alta, 1 ♀ (ZI); s.l., 20- I - 1940, M. Ramos, 1 ♀ (MRCN); s.l., 7 - I - 1941, s.c., 2 ♂, 1 ♀ (MRCN), s.l. Canoas, - VII - 1962, 2♀ (MRCN); Ilho do Governador, D. Federal, - VIII - 1954, M. Alvarenga, 2 ♀ (MRCN); Rio Grande do Sul, 24 - XI - 1938, F. Plauman, 1 ♂ (ZMU); s.l., 8 - IX - 1938, s.c., 1 ♀ (ZMU); s.l., 8 - IX - 1938, s.c., 1 ♂ (ZMU); s.l., 5 - IV - 1938, s.c., 1 ♀ (ZMU), s.l., 7 - IV - 1938, s.c., 1 ♂ (ZMU); s.l., 12 - V - 1938, s.c., 1 ♀ (ZMU); s.l., 20 - IV - 1938, s.c., 1 ♀ (ZMU); s.l., 29 - 31 - III - 1938, 1 ♂, 1 ♀ (ZMU); s.l., 1 - X - 1938, s.c., 1 ♀ (ZMU); s.l., 3 - XI - 1938, 2 ♀ (ZMU); Blumenan, 1 ♂ (ZMU); F. Sahlberg 1♀ (ZMU); Petropolis, s.c., 1 ♀ (ZMU); Nova Teutonia, 2 - XI - 1938, F. Plaumann, 1 ♂ (BMNH); Rio de Janeiro, 10 - VII - 1923, L.G. Saunders, 1 ♀ (BMNH); Minas Geraer, 1 ♂ (NR); Chapada, - V - 1 ♀ (CM); Santarem, 1 ♀ (CM); s.l., - V - VI - 1919, S.M. Klages, 2 ♂ (CM); Rio de Janeiro, VIII and XI, 1 ♂, 1 ♀ (CM); Corumba, - III - , 1 ♀ (CM). COLOMBIA: 1870, Nolken, 1 ♂ (NM); N: 46/20, Walker's Catal., 1 ♂ (BMNH); Bonda, - Vi -, 1 ♂ (CM). FRENCH GUIANA: 1899, R. Oberthür, Bar, Coll., 3 ♂, 1 ♀ (MNHN), Cayene, 1 ♂ (MNHN); F. Pillault, 5 ♂, 3 ♀ (IRSNB), Cayene, - II - 1917, 1 ♀ (CM). GUYANA: Berbice, 14 - VII - 1923, H.E. Box, 1 ♂ (BMNH); Bartlett Coll., 1 ♀ (BMNH); George Town, Botanical Garden, 18 - iv - 1913, G.E. Bodkin, 1 ♀ (BMNH). MEXICO: Vera Cruz, Signoret, 1 ♀ (MN); 1 ♂ (MNHU). PANAMA: Boucard, 1 ♀ (BMNH); Canal Zone, - XII - 1915, Th.M. 1 ♀ (UZM). PARAGUAY: - VI - 1936, F. Schade, 1 ♀ (ZMU). PERU: Iquitos, 15 - IX - 1929, Klug, 2 ♂, 4 ♀ (ZI); Marcapata, 2 ♀ (TM); Vilcanota,

1 ♀ (TM); Madre de Dios, boom, Garlepp, 1 ♂ (MNHU). SURINAM: Afoebakka, 23 - 27 - III - 1966, G.F. Moes, 1 ♂ (RNH); Wederrog, 24 - VI - 1938, Geijskes, 1 ♂ (RNH);;Boboenhol, 8 - VI - 1965, 1 ♀ (RNH); Paramaribo, - X - 1908, 1 ♀ (MNHU); Van Brussel, 2 ♂ (RNH); Paramaribo, 8 - XII - 1959, P.H. v. Doesburg 2 ♂, 5 ♀ (RNH); s.d., 1 ♂, 1 ♀ (IZA); Paramaribo Opnarkoeza, 5 - II - 1962, Bruckn, 1 ♀ (RNH); s.l., 6 - XII - 1964, D.C.G., 1 ♂, 1 ♀ (RNH); Paramaribo, 4 - IV - 1950, Gleijskes, 1 ♀ (RNH); Paramaribo Fernández Rd, 28 - VII - 1963, J.v.d. Veeht, 2 ♂, 5 ♀ (RNH); Paramaribo, 30 - VI - 1959, A.C. Geijskes, 1 ♂ (RNH); s.l., - XII - 1916, H.A.L. Menne, 1 ♂ (RNH); Kwattaweg, 30 - VI - 1939, A.C. Geijskes, 1 ♀ (RNH); Paramaribo, 25 - VI - 1960, P.H. v. Doesburg, 1 ♀ (IZA). VENEZUELA: Aragua: Maracay, 450m., 17 - XI - 1954, R. Simonpietri on Passiflora spp., 1 ♂, 1 ♀ (IZA); El Limón, 450m, 2 - X - 1952, F. Fernández Yépez, on Passiflora quadrangularis (fruit), 3 ♂ (IZA); Bolivar, Uruyén, 400m, 27 - iv - 1956, F. Fernández Yépez, C.J. Rosales, 1 ♀ (IZA); Guárico: Hato Las Lajas, 1 - IX - 1966, C.J. Rosales, A. Dascoli 1 ♀ (IZA); Monagas: Jusepín, 21 - IX - 1965, F. Fernández Yépez, C.J. Rosales on Passiflora edulis, 1 ♂ (IZA); s.l., 6 - VIII - 1966, s.c., 1 ♂ (IZA); Zulia: La Kasmera, Perijá, 31 - IV - 1962, Parencio, 1 ♀ (IZA); Dist. Federal: La Guayra, Breddin Coll., 1 ♀ (DEI).

c) Material without data: 1 ♀, labelled "H. clavigera det. Mayr", (NM); 2 ♀, labelled "South America", (NM); 1 ♀ labelled "III - 1944", (NMP); 1 ♂, labelled "346a, Walker's Catal.", (BMNH).

Plate 5

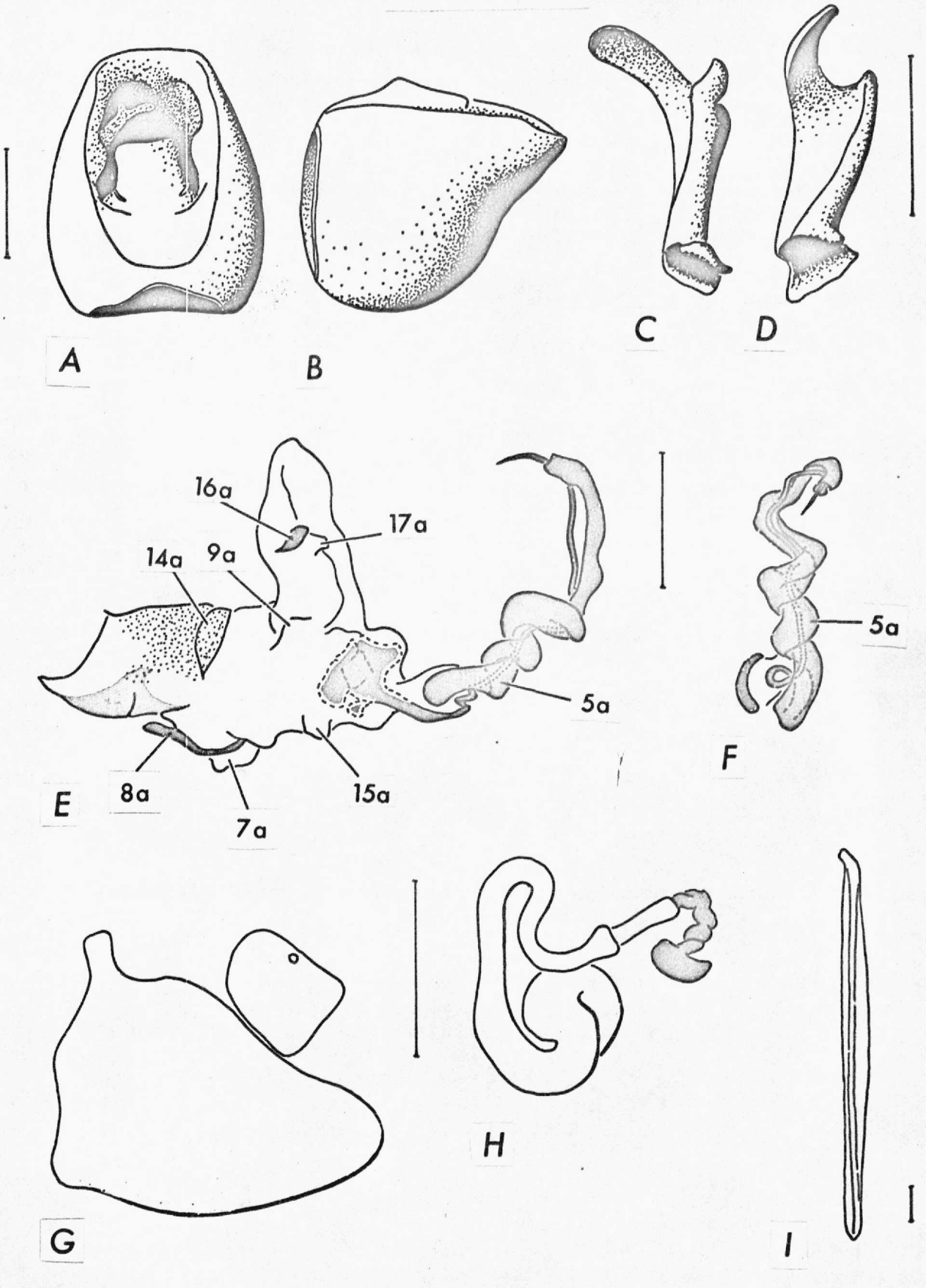


Table 2 Measurements (5 ♂♂ and 5 ♀♀ from 10 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	17.5–19.6	18.72	5	19.0–23.0	21.0
2 Head length	5	2.28–2.66	2.44	5	2.39–2.66	2.55
3 " width	5	2.12–2.31	2.24	5	2.22–2.43	2.33
Distance:						
4 inter-ocular	5	1.17–1.21	1.19	5	1.08–1.27	1.18
5 ante-ocular	5	0.95–1.10	1.01	5	1.00–1.14	1.07
Antennae:						
6 segm. I length	5	2.88–3.11	2.97	4	2.88–3.26	3.11
7 " II "	5	3.36–3.98	3.59	4	3.60–3.84	3.72
8 " III "	5	2.88–3.36	3.05	4	3.12–3.60	3.31
9 " IV "	3	4.36–6.24	5.05	3	4.89–5.28	5.15
Labium:						
10 segm. I length	5	2.52–2.94	2.76	5	2.75–3.09	2.98
11 " II "	5	2.31–2.94	2.70	5	2.66–3.42	3.02
12 " III "	5	1.52–1.71	1.63	5	1.65–1.90	1.81
13 " IV "	5	2.77–4.08	3.64	5	3.76–4.59	4.32
14 Pronotum length	5	2.21–3.07	2.89	5	2.92–3.60	3.33
15 " width	5	4.08–4.41	4.18	5	4.12–4.80	4.51
16 Scutellum length	5	2.09–2.26	2.16	5	2.12–2.35	2.34
17 " width	5	1.52–1.61	1.56	5	1.61–1.86	1.71
18 Hind tibia length	4	9.40–10.5	9.83	4	10.2–11.8	11.0
Tibial dilation:						
19 total width	4	0.72–0.76	0.74	4	0.76–1.05	0.92
external part:						
20 length	4	7.68–8.78	8.12	4	8.64–10.2	9.40
21 width	4	0.28–0.38	0.33		0.33–0.62	0.46
Ratios: (figures refer to character numbers above).						
1 / 2	5	7.14–8.15:1	7.67:1	5	7.48–9.62:1	8.23:1
1 / 18	4	1.82–2.04:1	1.90:1	4	1.74–2.04:1	1.90:1
2 / 2	5	1.02–1.16:1	1.08:1	5	1.07–1.11:1	1.09:1
6 / 2	5	1.10–1.33:1	1.21:1	4	1.13–1.27:1	1.21:1
10 / 2	5	1.08–1.22.1	1.13:1	5	1.03–1.27:1	1.16:1
9 / 6	5	1.49–2.05:1	1.70:1	5	1.60–1.83:1	1.65:1
15 / 16 %	5	1.82–2.11:1	1.93:1	5	1.78–2.10:1	1.92:1
20 / 18 %	5	78.0–85.0	82.6	5	81.9–88.1	85.2

Holhymenia rubiginosa (Breddin), 1904

(Plate 6)

Holymenia rubiginosa Breddin, 1904: 147. 2 Holotype ♀ Brasil (DEI) [examined, dissected]

General and differential diagnosis: Very similar to H. histrio showing no obvious external characters for separation of these two species, but it differs in the structure of spermatheca (fig. H) which in H. rubiginosa is considerably longer, thinner and has an additional curvature "d" beyond the curve "c".

Description: As for H. histrio except spermatheca.

Measurements (1 ♀ from 1 locality) in millimetres: Body length = 19.5; Head: length = 2.47, width = 2.22; Distance: inter-ocular = 1.14, ante-ocular = 0.98; Antenal segments: I = 2.98, II = 3.64, III = 3.31, IV = 4.70; Labial segments: I = 2.66, II = 2.47, III = 1.52, IV = 3.21; Pronotum: length = 3.07, width = 4.32; Scutellum: length = 2.09, width = 1.57; Hind tibia length = 10.60; Tibial dilation width = 0.84; External tibial dilation length = 9.26; External tibial dilation width = 0.43.

Ratios: Body length / head length = 7.84:1; Body length / tibia length = 1.83:1; Head length / Head width = 1.11:1; 1st Antennal segment / Head length = 1.20:1; 1st Labial segment / Head length = 1.07:1;

IVth Antennal segment / 1st Antennal segment = 1.57:1; Pronotum width / Sculellum length = 2.06:1; Tibial dilation length / Tibia length = 87.35%.

Discussion: The conception of this species is based on a single specimen, ♀ holotype, from Rio Grande do Sul, Brasil, the locality in which H. histrio also occurs, indicating that these species are sympatric. The condition of the external morphological characters of this specimen fall within the range of individual variation of females of H. histrio, though certain ratios, e.g. length of IV labial segment to head length has values outside the range observed in H. histrio, but just within the calculated range of the latter species. However, the structure of the spermatheca shows conditions not found or suggested by those observed in dissected females of H. histrio, and for this reason the status of H. rubiginosa as a distinct is at present provisionally retained pending collection and detailed examination of further material of both sexes of this species.

Material examined.

a) Type material: Holotype ♀ of Holymenia rubiginosa Breddin, labelled "Holymenia rubiginosa Bredd. Holotypus, Rio Grande do Sul, Coll. Bréddin" in DEI collection.

Plate 6

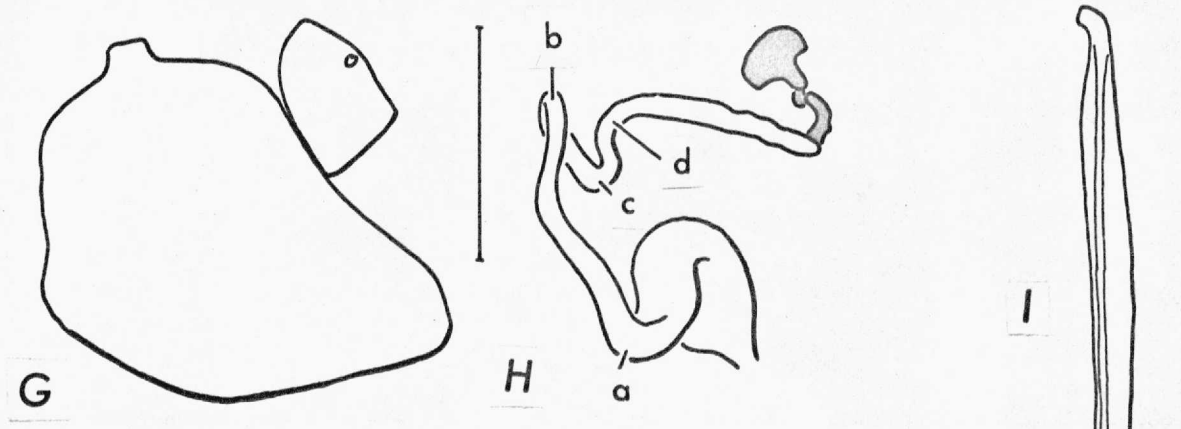


Plate 7

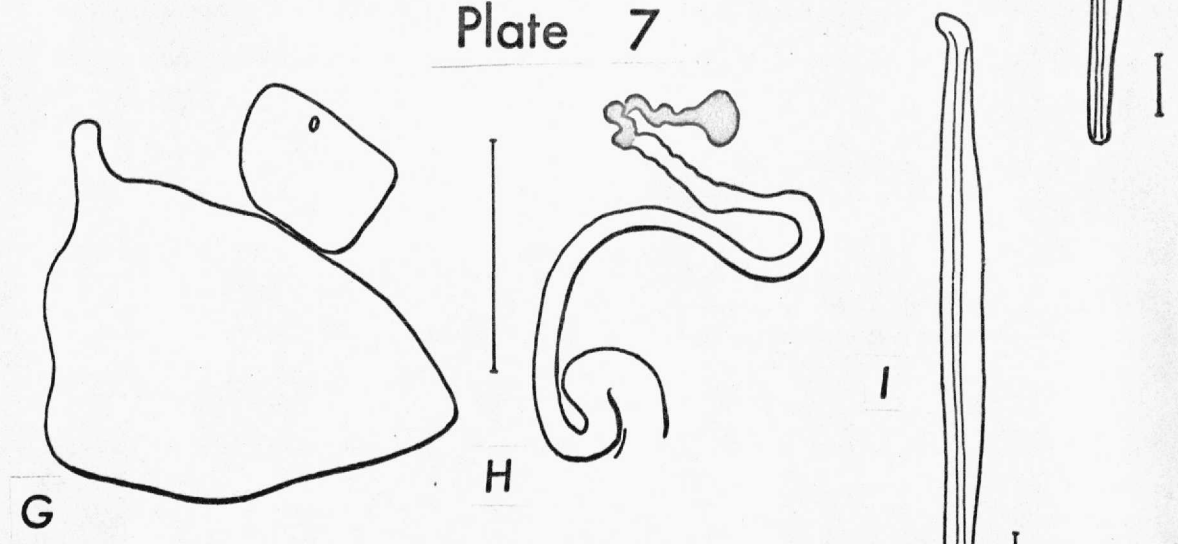
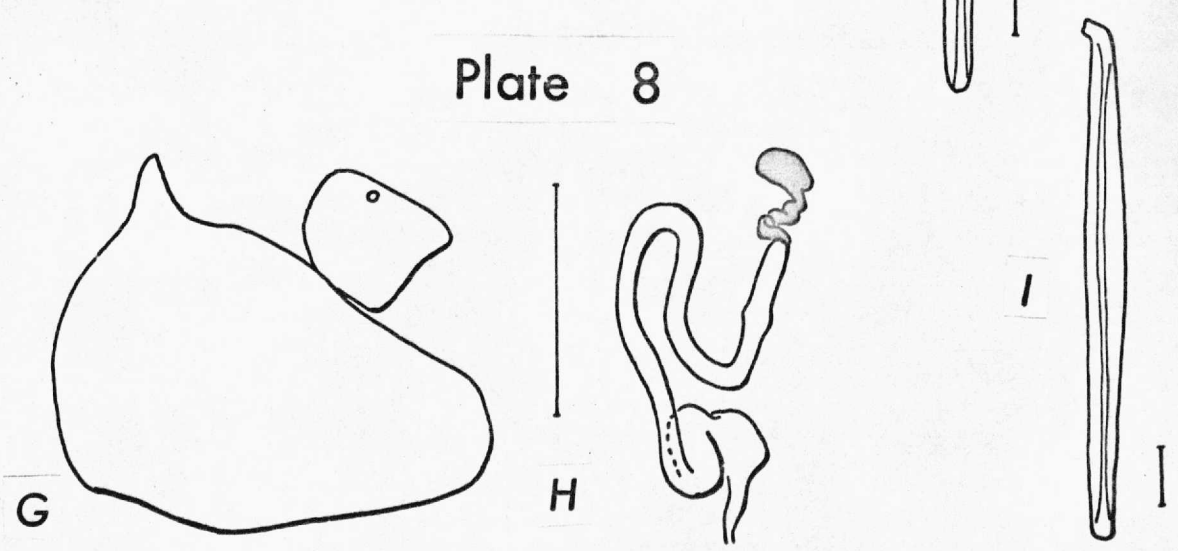


Plate 8



Holhymenia persimilis (Breddin), 1903

(Plate 7)

Holymenia persimilis Breddin, 1903: 382.2 Lectotype ♀, Bolivia (DEI) [examined, dissected].

General and differential diagnosis: Subrectangular central spot on pronotum; subtriangular basal spot on scutellum; and in ♀♀, shape of 1st gonocoxa and shape and size of the spermatheca. H. persimilis resembles H. histrio, H. ribiginosa and H. tucumana. From H. histrio and H. rubiginosa it can be distinguished by: wider posterior pronotal expansions, which touch and slightly overlap the basal sides of scutellum, the subtriangular black scutellar spot, the subrectangular central pronotal spot, the absence of yellowish white elongate patch on the IIIrd sternite and the labium reaching the IIIrd sternite. For differences between this species and H. tucumana, see description of the latter.

Description: (based only on females): Head.-Dorsal surface black with the following yellowish white markings: triangular spot between the eyes, anterior patch extending over the frons and tylus with its frontal area wide and rounded, and the anterior and lateral surfaces of juga. Ventral and lateral surfaces and labium yellowish white with the following black parts: antenniferous tubercles, the spot below the latter, area below and behind the eye, ventral margin of juga and tylus, as well

as the tip of the IVth labial segment. First three antennal segments and apex of IVth, black; most of the IVth segment yellowish white. Tylus with the deflected anterior part more or less rounded or straight, longer than and level with juga; the latter converging and slightly bulging, with rounded tips and medially curved inner margins slightly compressing and overlapping the lateral margins of tylus. Labium reaching the posterior margin of IIIrd sternite. Thorax.-Pronotum, pleural region and prosternum basically black, with the following yellowish white markings: On pronotum - subrectangular central spot, lateral spot situated behind the level of the central spot, rounded postero median spot, as well as calli, humeral angle and postero lateral margins of pronotum. On propleural area - the pleura, supracoxal lobes, pleural callus, infrahumeral area and a patch on postepimeral flange I. On mesopleura - anterior slightly elongate and oblique dorsal spot, the rounded posterior spot, central patch extending ventrally over the postepimeral flange II but interrupted by an oblique black band, and a thin black line running dorsally from the upper end and in continuation of the coxal cleft. On metapleura - peritreme, oblique band extending from the upper anterior corner of the pleura to the supracoxal lobe, small round spot on the anterior surface of supracoxal lobe, and the postepimeral flange III. Prosternum with a single yellowish white median patch; mesosternum laterally brownish, with a yellowish white median band; metasternum yellowish white. Scutellum yellowish white, with subtriangular dull black basal spot with incurved lateral margins and reaching half length of scutellum. All legs basically cinnamon: Fore leg - coxa yellowish white.

Middle leg - coxa orange brown to orange with its posterior surface yellowish white; apical 2/3rd of femur orange brown; base of tibia dark brown to black. Hind leg - coxa orange brown to orange; trochanter and the distal 2/3rd of femur orange brown; base of tibia dark brown to black. Fore wing without punctures; base of corium dark brown with an oval yellowish white spot. Lateral margins of pronotum tuberculate; humeral angles obtuse; posterior extensions subtriangular with rounded tips, wide and overlapping the basal sides of scutellum. Scutellum without punctures. Hind legs longer than fore and middle legs; hind tibia (fig. I) with a narrow inconspicuous external dilation along most of the length of tibia. Abdomen.-Tergites basically ochraceous-orange to vinnaceous-rufous, with darker central area; Ist tergite, posterior margin of tergites II to IV, the median part of tergite V, the whole of tergites VI to VIII and the connexivum, dark brown. Sternites, Ist gonocoxa and laterotergites reddish orange, with lateral marginal areas of sternites III to VII, darker; lateral areas of IInd sternite, circunspiracular areas and usually posterior margins of sternites IV to VI, yellowish white.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular with very long, narrow and curved spermathecal duct.

Measurements and Ratios: (see table 3).

Geographical distribution: (Map 1) The only two known specimens were collected in Bolivia.

Material examined.

Type material: Lectotype ♀ of Holymenia persimilis Breddin in DEI, labelled "Holymenia persimilis Bredd. Lectotypus, H. Goedike des. 1969, Yungas de La Paz, Bolivia 1000m"; also paralectotype ♀ labelled "Paralectotypus, H. Gaedike des. 1969, Yungas da La Paz, Bolivia, 1000m, Coll. Breddin" also in DEI.

Table 3 Measurements (2 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	–	——	—	2	17.9–19.4	18.65
2 Head length	–	——	—	2	2.31–2.37	2.34
3 " width	–	——	—	2	2.26	2.26
Distance:						
4 inter-ocular	–	——	—	2	1.19–1.25	1.22
5 ante-ocular	–	——	—	2	0.95–1.10	1.02
Antennae:						
6 segm. I length	–	——	—	2	2.85–3.06	2.95
7 " II "	–	——	—	2	3.36–3.60	3.48
8 " III "	–	——	—	2	2.97–3.16	3.06
9 " IV "	–	——	—	2	4.22–4.60	4.41
Labium:						
10 segm. I length	–	——	—	2	2.47–2.66	2.56
11 " II "	–	——	—	2	2.47–2.58	2.52
12 " III "	–	——	—	2	1.44–1.52	1.48
13 " IV "	–	——	—	2	2.75–2.85	2.80
14 Pronotum length	–	——	—	2	3.07–3.21	3.14
15 " width	–	——	—	2	4.22–4.46	4.34
16 Scutellum length	–	——	—	2	1.95–2.09	2.02
17 " width	–	——	—	2	1.42–1.48	1.45
18 Hind tibia length	–	——	—	2	10.1–10.6	10.4
Tibial dilation:						
19 total width	–	——	—	2	0.72–0.76	0.74
external part:						
20 length	–	——	—	2	8.88–9.12	9.00
21 width	–	——	—	2	0.28–0.38	0.33
Ratios: (figures refer to character numbers above).						
1 / 2	–	——	—	2	7.74–8.18:1	7.97:1
1 / 18	—	——	—	2	1.76–1.82:1	1.79:1
2 / 3	–	——	—	2	1.02–1.04:1	1.03:1
6 / 2	–	——	—	2	1.23–1.29:1	1.26:1
10 / 2	–	——	—	2	1.06–1.12:1	1.09:1
9 / 6	–	——	—	2	1.48–1.50:1	1.49:1
15 / 16 %	–	——	—	2	2.13–2.16:1	2.14:1
20 / 18 %	–	——	—	2	83.3–89.6	86.4

Holhymenia tucumana sp.n

(Plate 8)

General and differential diagnosis: oval calli spots; shield like central spot on pronotum; triangular spot at base of scutellum; and in ♀♀ the shape of Ist gonococa and shape and size of spermatheca. H. tucumana shows close relationships with H. histrio, H. rubiginosa and particularly with H. persimilis; with the latter it shares the following characters: position of the pronotal lateral spots, rounded posterior median spot, shape and position of the posterior pronotal extensions, and the absence of the yellowish white patch on the antero lateral margin of III sternite. For relationships with H. histrio see discussion on the latter. H. tucumana can be easily separated from H. histrio, H. rubiginosa and H. persimilis by the triangular scutellar spot and shield like central pronotal spot; from H. histrio and H. rubiginosa also by the shape of posterior pronotal extensions and their position relative to scutellum, and the absence of the yellowish white elongate patch on the IIIrd sternite; from H. persimilis by the absence of dark brown to black colouration on the basal part of middle and hind tibia, and by the isolated brown spot below the eye.

Description: (based only on females). Head.-Basically brown with the following yellowish white markings: wide triangular spot between the eyes extending laterally beyond the imaginary line traced from the

cleft between juga and autenniferous tubercles to the inner side of ocelli; anterior patch limited to frontal area, rounded and wide, extending to the base of juga and almost fused with the triangular spot; anterior and lateral surfaces of juga. Ventral and lateral surfaces and labium also yellowish white with the following parts brown: antenniferous tubercles, the spot below the latter, ventral margin of juga and tylus, inferior area below the eye separate from the dorsal brown colouration, as well as the tip of the IVth labial segment. First three antennal segments and apex of the IVth, dark brown to black; most of the IVth segment yellowish white. Tylus longer than and slightly elevated above juga, anterior deflected part of tylus curved; juga converging anteriorly, with rounded tips and straight median margins. Labium reaching the posterior margin of IIIrd sternite. Thorax.-Pronotum, pleural region and prosternum basically brown, with the following yellowish white markings: On pronotum - oval calli spots, shield like central spot, rounded postero median spot, the lateral spots which are situated behind the level of the central spot, and humeral angles. On propleural area - pleura, supracoxal lobes, pleural callus, infrahumeral area and a patch on the postepimeral flange I. On mesopleura - elongate and oblique anterior dorsal spot, rounded posterior spot, ventrally extended central patch, with its extension over the postepimeral flange II interrupted by an oblique brown band, and a thin dark brown line which runs dorsally from the upper end and in continuation of the coxal cleft. On metapleura - oblique band extended from the upper anterior corner of the pleura to the supracoxal lobe, small rounded spot on the anterior surface of the

latter, peritreme and postepimeral flange III. Prosternum with a single median patch; mesosternum brownish laterally, with a yellowish white median band; metasternum yellowish white. Scutellum yellowish white, with triangular brown basal spot, its apex reaching half length of scutellum. All legs basically cinnamon. Fore leg - coxa with external and posterior surfaces, yellowish white. Middle leg - coxa with the posterior surface yellowish white, the rest orange brown to orange; the apical 2/3rd of femur, orange brown to brown. Hind legs - coxa orange brown to orange; trochanter and the distal 2/3rd of femur orange brown to brown; base of femur, tibia and tarsus, cinnamon. Fore wing without punctures; base of corium dark brown with a circular yellowish white spot. Lateral margins of pronotum tuberculate; humeral angles obtuse; pronotal extensions subtriangular, short with rounded tips, overlapping lateral margins of the base of scutellum. Scutellum without punctures. Hind tibia (fig. I) very similar to H. histrio and H. persimilis, bearing a narrow external dilation extended over most of the length of tibia. Abdomen.-Tergites ochraceous orange to vinnaceous rufous, with darker central area, posterior margin of tergites III to V and the median part of tergite VI; posterior half of IInd tergite, posterior margin of Ist tergite and margins of connexivum of segments II to VI, brown; sternites, Ist gonocoxa, and laterotergites orange brown; lateral areas of IInd sternite, circunspiracular areas and usually posterior margin of sternites IV to VI, yellowish white.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIII laterotergite as shown in fig. G. spermatheca (fig. H) tubular, very elongated, spermathecal duct recurrent and narrow.

Measurements and Ratios: (see table 4).

Geographical distribution: (Map 2) Only known from Tucuman, Argentina.

Habitat and Biology: Two females collected in December contained fully developed eggs; these were 2.05 to 2.14mm long, oval and sub-triangular in cross section.

Discussion: Among the three specimens examined, one showed some differences in the shape and size of the triangular spot and of the frontal area of anterior patch on the head which were wider and almost fused with each other; also the metapleural oblique patch was extended over the whole of supracoxal lobe.

Material examined.

a) Type material: Holotype ♀ of Holhymenia tucumana, Argentina, Prov. Tucuman, in BMNH. Paralectotypes: 1 ♀ Argentina, Tucuman, Hogar Agrícola San Cayetano, 22 - XII - 1940, in MLP; 1 ♀, s.l., - XII - 1935, in MLP.

Table 4 Measurements (3 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	-	---	---	3	18.5-19.0	18.76
2 Head length	-	---	---	3	2.31-2.43	2.35
3 " width	-	---	---	3	2.16-2.18	2.16
Distance:						
4 inter-ocular	-	---	---	3	1.14-1.19	1.16
5 ante-ocular	-	---	---	3	0.91-0.96	0.94
Antennae						
6 segm. I length	-	---	---	3	2.66-2.94	2.81
7 " II "	-	---	---	3	3.21-3.26	3.22
8 " III "	-	---	---	3	2.73-3.12	2.94
9 " IV "	-	---	---	2	3.64-3.84	3.74
Labium:						
10 segm. I length	-	---	---	3	2.28-2.43	2.38
11 " II "	-	---	---	3	2.09-2.33	2.25
12 " III "	-	---	---	3	1.23-1.40	1.34
13 " IV "	-	---	---	3	2.18-2.71	2.49
14 Pronotum length	-	---	---	3	2.78-2.92	2.86
15 " width	-	---	---	3	4.03-4.32	4.17
16 Scutellum length	-	---	---	3	2.07-2.09	2.08
17 " width	-	---	---	2	1.40-1.44	1.42
18 Hind tibia length	-	---	---	3	8.88-10.0	9.52
Tibial dilation:						
19 total width	-	---	---	3	0.72-0.76	0.73
external part:						
20 length	-	---	---	3	7.92-9.02	8.47
21 width	-	---	---	3	0.28-0.38	0.33
Ratios: (figures refer to character numbers above).						
1 / 2	-	---	---	3	7.73-8.22:1	7.98:1
1 / 18	-	---	---	3	1.83-2.11:1	1.97:1
2 / 3	-	---	---	3	1.06-1.12:1	1.08:1
6 / 2	-	---	---	3	1.09-1.26:1	1.19:1
10 / 2	-	---	---	3	0.98-1.04:1	1.01:1
9 / 6	-	---	---	2	1.30-1.36:1	1.33:1
15 / 16 %	-	---	---	3	1.92-2.08:1	2.00:1
20 / 18 %	-	---	---	3	88.4-89.4	88.9

Holhymenia vulsa sp.n.

(Plate 9)

General and differential diagnosis: Juga straight and parallel; shield like central spot; oval lateral spots, and acute lanceolate postero median spot, on pronotum. Characteristic features of ♂♂: shape and size of genital capsule and parameres, shape, relative size and position of processes 16a-b and 17a-b, shape and degree of development of processes 9a-b, and shape and size of process 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca. H. vulsa is not closely related to any of the other species of Holhymenia, although it seems to have some affinity with the group consisting of: H. histrio, H. rubiginosa, H. persimilis and H. tucumana.

Description: Head.-Dorsal surface black, with the following yellowish white markings: tylus, anterior and lateral surfaces of juga and neck. Ventral and lateral surfaces, and labium yellowish white, with the following dark brown to black parts: anteniferous tubercles, an elongate spot below the latter, area posterior and below the eye, ventral margin of juga, as well as the tip of the IVth labial segment. First three antennal segments and apex of IVth dark brown to black; most of the IVth segment, yellowish white. Tylus decurved, longer than and approximately level with juga; the latter straight and parallel, with

blunt tips and straight median margins. Labium reaching the posterior margin of IInd sternite. Thorax.-Pronotum and propleural area basically black, with the following yellowish white markings: On pronotum - shield like central spot, lateral spots situated behind the level of the central spot, acute lanceolate postero median spot, calli and humeral angles. On propleural area - pleura, supracoxal lobes, pleural callus, precoxal bridge, infrahumeral area and a subtriangular wide patch on postepimeral flange I. Mesopleura, metapleura, and pro and mesosternum basically yellowish white with the following black markings: On mesopleura - dorsal half and a dull oval spot on the lower half of postepimeral flange II, round patch on the anterior and upper area of pleura, and the oval spot above the coxal cleft. On metapleura - wide oblique band extending from the upper anterior corner of pleura to the antero-lateral surface of supracoxal lobe, narrow band bordering dorsally the latter, and an oblique band extending over the boundary between pleura and postepimeral flange III. On prosternum - a pair of lateral spots extending posteriorly from the collar over the inner side of precoxal bridge I. On mesosternum - precoxal bridge II. Metasternum yellowish white with slightly reddish orange to orange tinge. Scutellum yellowish white, with wide trapezoidal spot at base and the ridged part of lateral margins dull black. All legs basically cinnamon. Fore leg - coxa yellowish white. Middle leg - coxa and trochanter orange brown to orange with the posterior surface of coxa yellowish white, and the apical 2/3rd of femur orange brown. Hind leg - coxa orange brown to orange, trochanter and distal 2/3rd of femur orange brown to reddish brown, basal 1/3rd of the latter with an

oval dark brown patch on the inner side. Fore wing very scarcely punctated at base; the latter dark brown with oval yellowish white spot. Pronotal calli slightly elevated; humeral angles subobtuse; pronotal extensions subtriangular, more or less elongate, placed at some distance from the lateral margins of the base of scutellum. Scutellum without punctures. Hind legs longer than fore and middle legs; hind tibia (fig. I) with long, slightly curved not very conspicuous external dilation, which extends almost over the whole length of tibia. Abdomen.-Tergites dark yellow to ochraceous-orange with the following chestnut-brown markings: subtriangular patch on IIIrd tergite, a patch covering most of the median area and posterior margin of IVth tergite, and a patch extending over the whole median area and most of posterior margin of tergites Vth and VIth respectively; Ist tergite dark brown to black; triangular patch on IInd tergite and the margins of connexivum of segments III to V dark brown. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, orange brown to reddish orange; lateral marginal areas of sternites III to VII darker; lateral areas of IInd sternite, a wide patch at the antero lateral half of IIIrd sternite, circumspiracular areas, and usually the posterior margins of sternites III to VI, yellowish white.

Male genitalia: Genital capsule (fig. A,B) - posterior margin, broad, with slight median notch and below the level of lateral margins, the latter slightly sinuated. Parameres (fig.C,D) - outer lobe small, acute and slightly bent laterally; shaft dorsally flattened; shank subapically wider than at base, with subacute apex. Phallus: (fig. E):

phallotheca dorsally and laterally very slightly sclerotized, with processes 14a-b thick and slightly sclerotized; conjuntiva armed with the following processes: 16a-b heavily sclerotized and pointed, 17a-b membranous and conspicuous, 9a-b membranous small and flat, 15a-b very conspicuous, and 5a (fig. E,F) with the third convolution tightly coiled.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular, rather thick at base becoming narrow towards the apex.

Measurements and Ratios: (see table 5)

Geographical distribution: (Map 1) Only known from Bolivia.

Habitat and Biology: Fully developed eggs were found in two females, unfortunately there was no date of collection on the labels; the eggs are oval, subtriangular in cross section, length 2.28mm, width 1.52mm.

Discussion: The most important variations observed in the examined material were as follow: in one ♀ the size of the pronotal spots were considerably reduced and the tylus markedly below the level of juga.

Material examined.

a) Type material: Holotype ♂ of Holhymenia vulsa Bolivia, Coroico, preserved in NR collection. 2 ♀♀ Paratypes: one from Bolivia, San Antonio, and the other from Bolivia, Chaco, also preserved in NR collection.

Plate 9

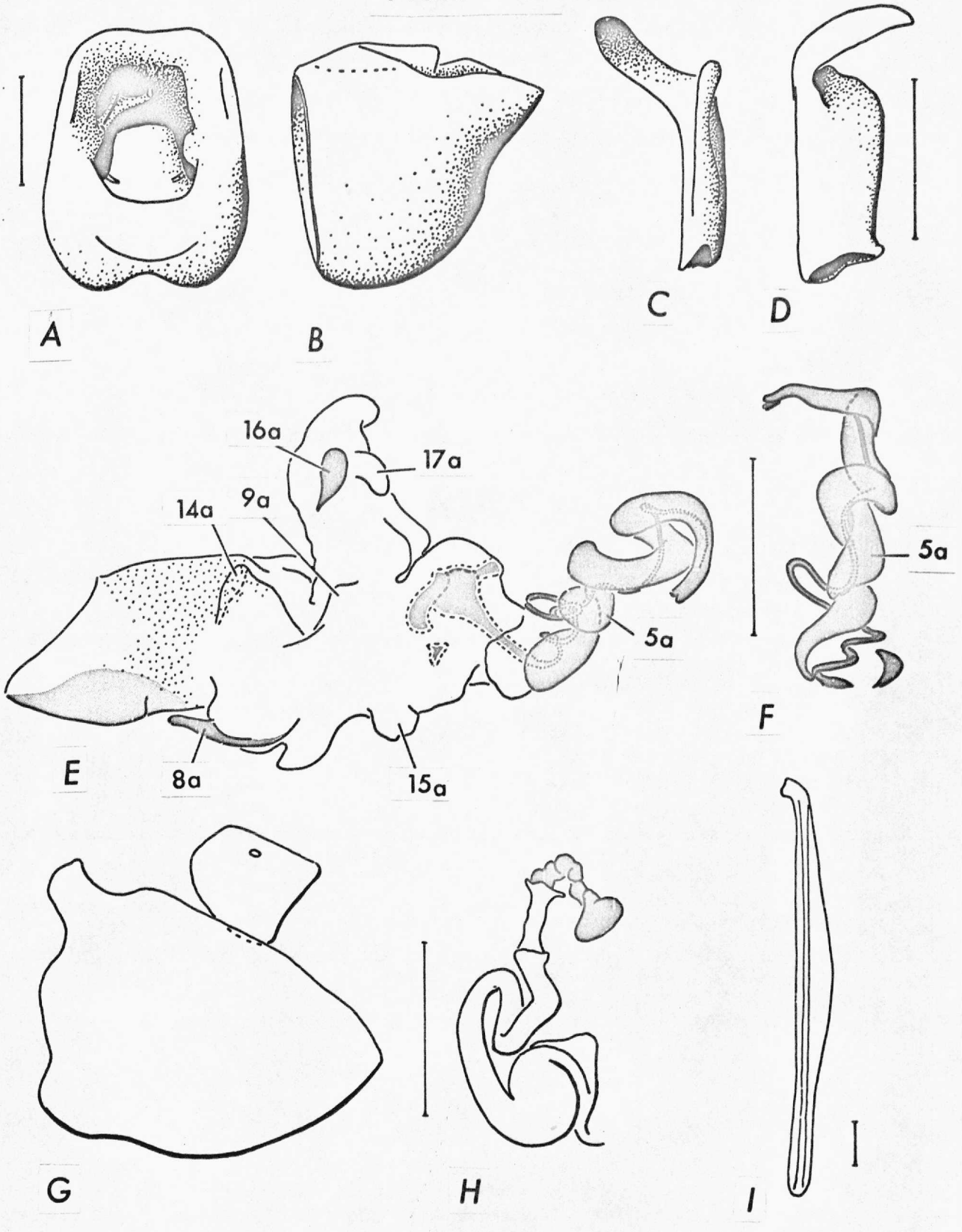


Table 5 Measurements (1 ♂ and 2 ♀♀ from 2 localities) in millimetres:

Characters	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	18.0	18.0	2	20.0–21.0	20.5
2 Head length	1	2.33	2.33	2	2.33–2.37	2.35
3 " width	1	2.18	2.18	2	2.26	2.26
Distance:						
4 inter-ocular	1	1.10	1.10	2	1.17–1.21	1.19
5 ante-ocular	1	0.87	0.87	2	0.91–0.95	0.93
Antennae:						
6 segm. I length	1	3.26	3.26	2	2.97–3.40	3.18
7 " II "	1	3.26	3.26	2	2.45–3.98	3.71
8 " III "	1	2.88	2.88	2	3.02–3.36	3.19
9 " IV "	1	4.22	4.22	2	4.03–4.32	4.17
Labium:						
10 segm. I length	1	2.28	2.28	2	2.28–2.47	2.37
11 " II "	1	2.09	2.09	2	2.16–2.26	2.21
12 " III "	1	1.14	1.14	2	1.38–1.42	1.40
13 " IV "	1	2.22	2.22	2	2.14–2.24	2.19
14 Pronotum length	1	3.16	3.16	2	3.12–3.36	3.24
15 " width	1	4.08	4.08	2	4.22–4.94	4.58
16 Scutellum length	1	2.09	2.09	2	1.91–2.28	2.09
17 " width	1	1.61	1.61	2	1.52–1.78	1.65
18 Hind tibia length	-	—	—	2	9.45–10.5	10.0
Tibial dilation:						
19 total width	-	—	—	2	0.84	0.84
external part:						
20 length	-	—	—	2	8.16	8.16
21 width	-	—	—	2	0.48–0.52	0.50
Ratios: (figures refer to character numbers above).						
1 / 2	1	7.72:1	7.72:1	2	8.58–8.86:1	8.72:1
1 / 18	-	—	—	2	1.98–2.11:1	2.05:1
2 / 3	1	1.06:1	1.06:1	2	1.03–1.04:1	1.03:1
6 / 2	1	1.39:1	1.39:1	2	1.27–1.43:1	1.35:1
10 / 2	1	0.97:1	0.97:1	2	0.97–1.04:1	1.00:1
9 / 6	1	1.29:1	1.29:1	2	1.27–1.35:1	1.31:1
15 / 16 %	1	1.95:1	1.95:1	2	2.16–2.20:1	2.19:1
20 / 18 %	-	—	—	2	77.2–86.3	81.6

Holhymenia costalima sp.n

(Plate 10)

[Copius intermedius Burmeister: Herrich-Schaeffer, 1844: 2, fig. 680. Misidentification]

[Copius maculatus Thunberg: Dallas, 1852: 466; Walker 1871: 153. Misidentification]

[Copium maculatum Thunberg: Stål, 1863: 51. Misidentification]

[Holymenia clavigera Herbst: Stål, 1870: 157.2; Blöte, 1936: 27. Misidentification]

General and differential diagnosis: Subtriangular spot between the eyes; anterior patch extended over the frons, tylus and juga; small oval spot on the apex of IIIrd antennal segment; rectangular longitudinal spot on pronotum; and the shape and size of the external tibial dilation. Characteristic features of ♂♂: shape and size of genital capsule and parameres. Those of ♀♀: the shape of Ist gonocoxa and the shape and size of spermatheca. H. costalima shows close relationships with H. clavigera, which is indicated by sharing the condition of the anterior patch on the head, and of the spot on IIIrd antennal segment; it can be differentiated from H. clavigera by the other characters listed above.

Description: Head. Dorsal surface black with the following yellowish white markings: small subtriangular spot between the eyes, anterior patch extending over frons, tylus, the whole dorsal and anterior surfaces of juga, and the neck. Ventral and lateral sides of head and labium, yellowish white, with the following dark brown to black parts: antenniferous tubercles, area behind and below the eye, sides and ventral margins of juga, most of the ventral area of tylus, and the tip of IVth labial segment. First two antennal segments, most of the IIIrd and the tip of the IVth segment, black; an oval spot on apex of IIIrd and most of the IVth segment, yellowish white. Tylus decurved, longer than and elevated above juga; the latter converging anteriorly with obtuse tips and straight medial margins. Labium reaching the posterior margin of IIIrd sternite. Thorax. Pronotum, pleural region and mesosternum basically black, with the following yellowish white markings: On pronotum - calli, two rounded lateral spots, rectangular median band, humeral angles and postero lateral margins. On propleural area - irregular pleural spot above the coxal cleft, supracoxal lobes, infra-humeral area and the wide patch on postepimeral flange I. On mesopleura - antero dorsal oval spot, margin of the ventral half and dorsal margin and corner of postepimeral flange II, wide central patch and episternal lobe; the two latter separated by a narrow black band. On metapleura - subtriangular spot on the supracoxal lobe, wide oval spot on the upper half of the pleura, peritreme and the upper $\frac{3}{4}$ of postepimeral flange III. Prosternum black; mesosternum with a single wide median patch. Prosternum and metasternum yellowish white. Scutellum yellowish white, with the subquadrangular spot at the base, several punctured spots scattered

behind the latter, and narrow areas immediately median to the lateral ridges, dark brown to black. All legs basically cinnamon : Fore leg - internal surface of coxa dark brown. Middle leg - coxa pale orange with the posterior surface yellowish white; trochanter cinnamon with some pale orange colouration; distal half of femur orange brown. Hind leg - coxa orange brown to orange; trochanter and the distal 2/3rd of femur orange brown; margin and submarginal area of external dilation of tibia, dark brown. Fore wing scarcely punctate; base of corium dark brown with an elongate yellowish white spot. Pronotum with an anteromedian depression; calli slightly elevated; humeral angle obtuse, and pronotal extensions elongate, medially curved with blunt to subacute tips and distant from the base of scutellum. Hind legs longer than fore and middle legs, hind tibia (fig. I) with a prominent external dilation, gradually widening and ending in a subrectangular angle to tibia. Abdomen. Tergites ochraceous orange to vinnaceous rufus, with posterior median margin of tergites II to V, the scent gland scars and connexivum darker; Ist tergite dark brown to black. Sternites, Ist gonocoxa and laterotergites in females and genital capsule in males, orange brown to reddish orange; lateral marginal areas of sternites III to VI, darker; lateral area of IInd sternite, an oblique wide spot on the antero lateral margins of IIIrd sternite, and circunspiracular areas, yellowish white; an oblique spot extending from the margin of IInd sternite to the first spiracle, dark brown to black.

Male genitalia: Genital capsule (fig. A,B) - posterior margin medially notched, and above the level of lateral margins; the latter

slightly descending posteriorly, then raised towards the posterior margin. Paramere (fig. C,D) - outer lobe rounded, and shank long with rounded and flattened apical edge. Phallus (fig. E): phallotheca slightly sclerotized dorsally and laterally, with processes 14a-b slightly sclerotized and acute; conjunctiva with elongate dorsal sac, gradually tapering towards the apex, and armed with the following processes: 16a-b heavily sclerotized, spur like, near the apex of dorsal sac; 17a-b membranous and rounded; 15a-b enlarged and prominent; 8a-b wide with rounded external margins and obtuse tips; 5a (fig. E,F) with third convolution loosely coiled.

Female genitalia: Ist gonocoxa and laterotergite VIII as shown in fig. G; spermatheca of characteristic shape and size as illustrated in fig. H.

Measurements and Ratios: (see table 6)

Geographical distribution: (Map 3) According to the labels all the material studied is of Brasilian origin, but unfortunately without detailed information except for four specimens from Rio de Janeiro; Da Costa Lima also reported it, under the name of H. clavigera as occurring in Estrela, Edo de Rio; the illustration in his publication (1940) clearly shows that it represents H. costalima.

Habitat and Biology: Fully developed eggs were found in two females, unfortunately there was no date of collection; the eggs are oval, sub-triangular in cross section, length 2.18mm and width 1.52mm.

Da Costa Lima and Menezas Mariconi have reported H. clavigera as feeding on Passiflora edulis (Porchita Maracuya) and on Psidium sp respectively. Da Costa Lima reported Hexacladia smithii Ashmead (Encyrtidae, Hym,) as parasite of H. clavigera. It seems to me that these observations may refer not to H. clavigera but to misidentified specimens of H. costalima as is here conceived, although there is no illustration or description to confirm the identities of the specimens of these authors.

Discussion: Some variations were observed among the material studied, namely: one specimen from Rio de Janeiro had the humeral angle subacute, with the tip somewhat bent posteriorly; another from the same locality had a small elongate lateral yellowish white spot on the mesosternum, and in two other specimens this spot was also present but of irregular shape.

H. costalima has been in the past generally confused with H. clavigera; this was perpetuated in the literature as well as in the collections of the principal museums of Europe and was naturally followed in the economic literature in which all records of H. clavigera refer in fact to H. costalima; both species are very similar, but can be easily differentiated by the size and shape of the yellowish white colouration on the IIIrd antennal segment which in H. costalima is restricted to an oval spot at the apex, and in H. clavigera it extends over most of the segment, being wide at apex and acute proximately, reaching close to the base.

Although Herbst's type of H. clavigera is lost and his description is inaccurate, the identity of this species can be very easily established from his illustration of the original material. Stoll, 1788, published an

illustration of a species with no name and without reference to Herbst, but the comparison of the two illustrations shows that they are identical, i.e. both refer to H. clavigera Herbst, 1784. Thunberg, 1825 and Saint Fargeau & Serville, 1825, in erecting their new species Copium maculatum and Holhymenia latreillei, respectively, both refer to the illustration given by Stoll, and therefore these two names must be considered as junior synonyms of H. clavigera Herbst, 1784. One detail in the description of H. latreillei St. Farg. Serville (white apex of IIIrd antennal segment) suggested that in spite of being referred to Stoll's illustration it may represent H. costalima; however the reference to the illustration is considered more reliable.

Herrich-Schaeffer, 1844, described and illustrated a female specimen from Brasil, under the name of Copius intermedius Burmeister, 1835, but at the same time he stated that it did not fully agree with any of the Burmeister's species; the condition on the antennal spot illustrated by Herrich-Schaeffer, shows that his specimen represents H. costalima. Burmeister's original description of C. intermedius indicates that it is the same as H. clavigera and therefore is a junior synonym of the latter. Dallas, 1852 and Walker, 1871, reported Copius maculatus, but my examination of their specimens preserved in BMNH, showed that these represent H. costalima as here defined. Stål, 1868 was the first to recognize that two species were involved, namely: Copium intermedium Burmeister, which he defined as having elongate antenniferous spot, and Copium maculatum Thunberg, as the species with small antennal spot, (= H. costalima in my conception); later 1870, he retained H. internedia

Burmeister as a good species, but synonymized C. maculatum Thunberg and C. intermedius of Herrich-Schaeffer with H. clavigera (Herbst). Thus although the identities of the two species were known, only one, i.e. Holhymenia clavigera (Herbst) 1784 has a valid name. As explained above, the names given to the other species namely: Copius intermedius Burmeister (by Herrich-Schaeffer), and Copius maculatus Thunberg (by Dallas and Walker), Copium intermedium Burmeister and later Holymenia intermedia (Burmeister) (by Stål), are all junior synonyms of H. clavigera. Consequently this is an unnamed species and I have the pleasure of naming this species in honour of Prof. A. Da Costa Lima, in recognition of his valuable contribution to Entomology.

Material examined.

a) Type material: Holotype ♂ of Holhymenia costalima, labelled "Rio Jan., Stål" from Rio de Janeiro, Brasil, is preserved in NR collection.

Paratypes: BRASIL: 1 ♀ (NR); Rio Janeiro, 1 ♀ (NR); s.l. November, 1 ♀ (CM); 1 ♂, 1 ♀ (IRSNB); 1 ♂ (UZM); Rio de Janeiro, 1 ♂ (IZA); 1 ♂ (BMNH); Rio de Janeiro, Winthen, 4♀ (RNH); 1 ♂, 1 ♀ (TM); 2♀ (ZSBS); Eversmann, 2 ♀ (ZI); 1 ♀ (ZI).

Plate 10

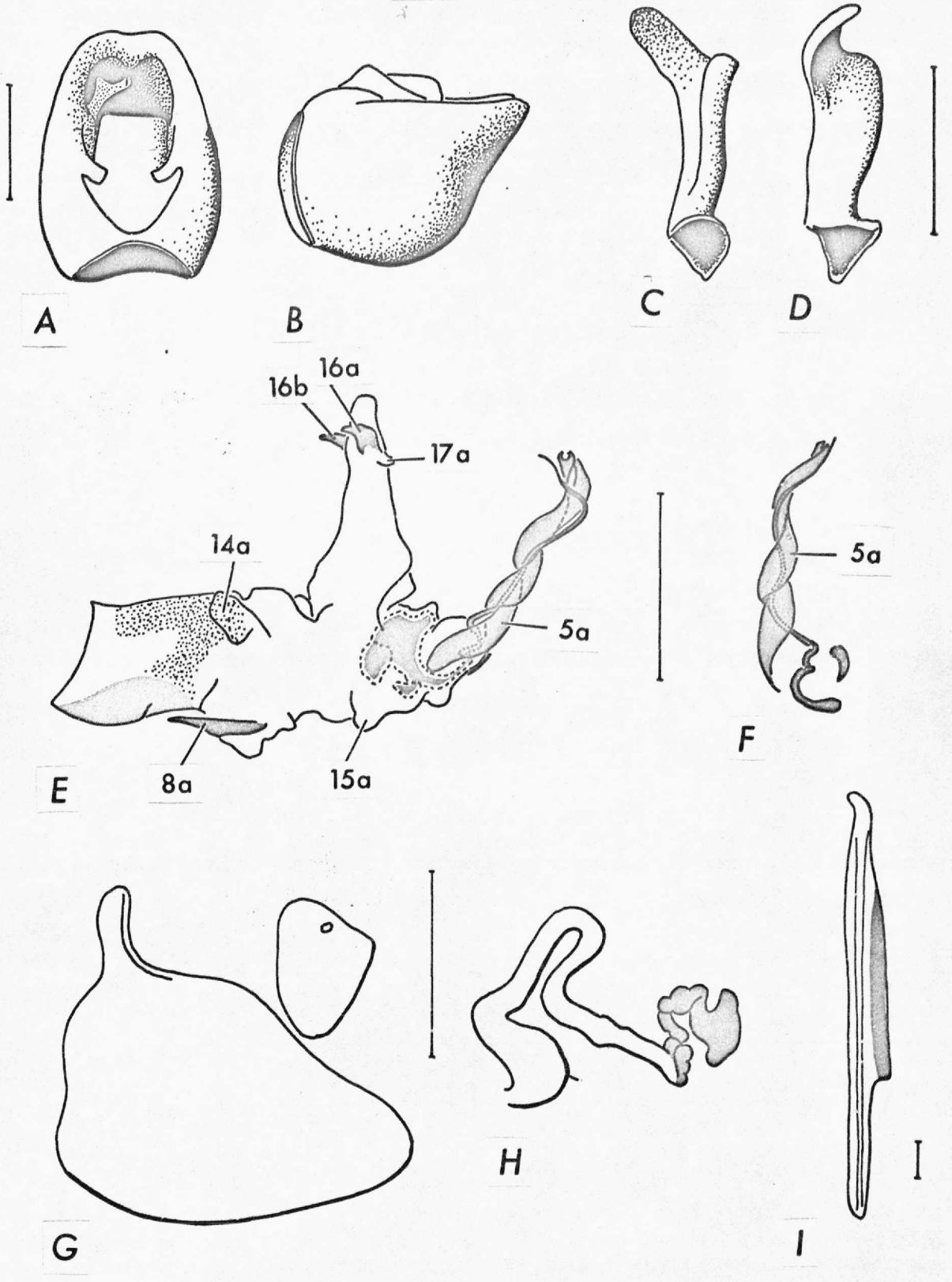


Table 6 Measurements (4 ♂♂ and 4 ♀♀ from 2 localities) in millimetres:

	Characters:	Males			Females		
		No.	Range	Mean	No.	Range	Mean
1	Body length	4	19.0–20.0	19.32	4	19.0–22.0	21.12
2	Head length	4	2.31–2.56	2.43	4	2.31–2.77	2.67
3	" width	4	2.33–2.45	2.39	4	2.33–2.66	2.54
	Distance:						
4	inter-ocular	4	1.25–1.34	1.29	4	1.25–1.48	1.42
5	ante-ocular	4	0.93–0.96	0.94	4	0.93–1.10	1.04
	Antennae:						
6	segm. I length	4	3.07–3.61	3.35	4	3.07–3.61	3.41
7	" II "	4	3.36–3.88	3.67	4	3.36–4.41	3.91
8	" III "	4	3.16–3.55	3.35	4	3.16–4.12	3.54
9	" IV "	1	5.08	5.08	1	5.04	5.04
	Labium:						
10	segm. I length	4	2.52–2.77	2.61	4	2.52–2.85	2.87
11	" II "	4	2.47–2.79	2.54	4	2.35–2.85	2.83
12	" III "	4	1.19–1.42	1.26	4	1.19–1.33	1.29
13	" IV "	4	2.39–2.88	2.62	4	2.39–3.11	2.94
14	Pronotum length	4	3.36–3.50	3.37	4	3.26–4.12	3.70
15	" width	4	3.84–4.65	4.19	4	4.12–5.47	4.96
16	Scutellum length	4	2.18–2.56	2.37	4	2.18–2.85	2.64
17	" width	4	1.52–1.71	1.57	4	1.52–2.09	1.88
18	Hind tibia length	4	9.98–11.71	10.58	2	9.98–10.32	11.11
	Tibial dilation:						
19	total width	4	0.96–1.00	0.98	2	0.96	0.96
	external part:						
20	length	4	8.64–10.08	9.06	2	8.64–8.88	9.79
21	width	4	0.52–0.62	0.58	2	0.76	0.76
	Ratios: (figures refer to character numbers above).						
	1 / 2	4	7.56–8.31:1	7.95:1	4	7.45–8.50:1	7.91:1
	1 / 18	4	1.70–1.90:1	1.82:1	2	1.70–2.05:1	1.90:1
	2 / 3	4	0.99–1.04:1	1.01:1	4	1.00–1.08:1	1.05:1
	6 / 2	4	1.29–1.41:1	1.37:1	4	1.18–1.31:1	1.27:1
	10 / 2	4	1.05–1.09:1	1.07:1	4	1.00–1.15:1	1.07:1
	9 / 6	1	1.57:1	1.57:1	1	1.57:1	1.57:1
	15 / 16 %	4	1.55–1.88:1	1.76:1	4	1.81–1.92:1	1.87:1
	20 / 18 %	4	83.72–86.57	85.63	2	88.0–88.25	88.11

Holhymenia clavigera(Herbst), 1784 comb. n

(Plate 11)

Cimex claviger Herbst, 1784: 260, pl. 39, fig. 4. NEOTYPE ♂, Brasil (MNHN), here designated [examined, dissected].

Copium maculatum Thunberg, 1825: 8.1 Holotype Surinan (lost) [Synonymized by Stål, 1870: 157].

Copium maculatum Thunberg: Stål, 1868: 51

Holhymenia latreillei Saint Fargeau & Serville, 1825: 62. Holotype ♀, Surinam (lost) [synonymized by Stål, 1870: 152].

Copius intermedius Burmeister 1835: 330.2 Holotype Surinan (ZIH)? Syn.n

Copius latreillei (St. Frag.-Serville): Burmeister, 1835: 330.4; Amyot & Serville, 1843: 223.2; Stål, 1868:51

Copium intermedium (Burmeister): Stål, 1868: 50

Holymenia intermedia (Burmeister): Stål, 1870: 157.2; Blöte, 1936: 27.

Holymenia tibialis Breddin, 1904: 147. Holotype ♀, Bolivia (DEI) [examined, dissected] Syn. n.

Stoll, Puns, pl.22, fig. 152.

General and differential diagnosis: Anterior patch extended over the frons, tylus and most of the juga; wide and acute spot on IIIrd antennal segment; lanceolate longitudinal spot on pronotum; shape and size of the external tibial dilation. Characteristic features of ♂♂:

shape and size of genital capsule and parameres. Those of ♀♀: shape of Ist gonocoxa and the shape and size of spermatheca. (for differences between this species and H. costalina, see description of the latter).

Description: Head. Dorsal surface black, with the following yellowish white markings: anterior patch extending over frons, and the basal ¼ of juga, and the anterior part of neck. Ventral and lateral surfaces and labium yellowish white, with the following dark brown to black parts: antenniferous tubercles, area posterior and below the eye, anterior ¼ and lateral face of juga, ventral margin of tylus, the base of labium and the tip of the IVth labial segment. First two antennal segments approximately 1/3rd proximal part of IIIrd segment, and the tip of the IVth, black; acute spot extending approximately over the distal 2/3rd of IIIrd segment and most of the IVth segment yellowish white. Tylus decurved, longer than and slightly elevated above juga, the latter converging anteriorly with obtuse tips and slightly curved median margins; labium reaching the middle of IIIrd sternite. Thorax. Pronotum, pleural region, pro and mesosternum basically black, with the following yellowish white markings: On pronotum - rounded lateral spots and lanceolate median band, calli, humeral angle and postero lateral margins. On propleural area - supracoxal lobes, infrahumeral area, wide patch on postepimeral flange I, and pleural spot. On mesopleura - rounded antero dorsal spot, wide central patch, supracoxal lobe except a black spot above coxal cleft, margin of the ventral half and the dorsal margin and corner of postepimeral flange II. On metapleura - suboval spot on supracoxal lobe, a wide oval spot on the upper half of the pleura,

peritreme and the upper part of postepimeral flange III. On prosternum - a single median spot. On mesosternum a median longitudinal wide band. Metasternum yellowish white. Scutellum yellowish white; basal spot subquadrangular with several punctured spots around its margins, and the narrow area immediately medial to the lateral ridges dark brown to black. All legs basically cinnamon: Fore legs - coxa yellowish white, with the posterior and internal surfaces dark brown; trochanter with small irregular scattered orange brown spots; femur with proximal end and the internal apical half dark brown, and the external and posterior apical half brownish. Middle leg - coxa pale orange with the posterior surface yellowish white; trochanter pale orange; distal half of femur orange brown. Hind leg - with coxa orange brown to orange; trochanter, the proximal end and the distal 2/3rd of femur orange brown; margin and submarginal area of external dilation of tibia, dark brown. Fore wing scarcely puntate at base, the latter dark brown with an elongate yellowish white spot. Pronotum with an anterior median depression; calli slightly elevated; humeral angle rounded to subobtuse; posterior extensions separated from bases of scutellum, elongate, medially curved, with blunt to subacute tip. Hind legs longer than fore and middle legs; hind tibia (fig. I) with a prominent external dilation, gradually widened spine like lateral extension. Abdomen. Tergites ochraceous orange to vinaceous rufous, with darker posterior median margin of tergites II to V, scent gland scars and connexivum; Ist tergite dark brown to black. Sternites, Ist gonocoxa and laterotergites in females and genital capsule in males orange brown to reddish orange, with lateral marginal areas

of sternites III to VI, darker; lateral areas of IInd sternite, wide oblique patch at the antero lateral margin of IIIrd sternite and circunspiracular areas, yellowish white; an oblique spot extending from the lateral margin of IInd sternite to the first spiracle, dark brown to black.

Male genitalia: Genital capsule (Fig. A,B) - posterior margin broad, entire, somewhat curved and above the level of lateral margins; the latter descending posteriorly and then ascending toward the posterior margin. Paramere (fig.C,D) - with subacute outer lobe and long lanceolate shank. Phallus (fig. E): very similar in shape but slightly smaller than in H. costalima; phallotheca dorsally and laterally slightly sclerotized, with processes 14a-b acute and slightly sclerotized; conjunctiva with elongate dorsal sac gradually tapering towards the apex, armed with the following processes: 16a-b comparatively small, heavily sclerotized and spur like, placed near the apex of dorsal sac; 17a-b membranous and rounded; 15a-b enlarged and prominent; 8a-b wide, with rounded external margins and obtuse tip; 5a (fig. E,F) with third convolution loosely coiled.

Female genitalia : Ist gonocoxa and laterotergite VIII as shown in fig. G; spermatheca of characteristic shape and size as illustrated in fig. H.

Measurements and Ratios: (see table 7)

Geographical distribution : (Map 3). The range of this species extends over the central and northern part of South America, the available material being collected in Brasil, Bolivia, Peru, French Guiana and Venezuela.

Discussion: The following variations were observed in the examined material: prosternum without the single median yellowish white spot in a ♂ from the south of Venezuela and in 1 ♂ and 1 ♀ from Brasil; in one ♂ from Guyana the tibial dilation was inconspicuous without dark brown colouration, and in a ♂ from southern Venezuela, the tibial dilation was smaller than usual.

As already mentioned in the discussion of H. cortalima, the name H. clavigera has been widely used for specimens of this species, and all reports on economic importance of H. clavigera in fact refer to H. costalima.

Material examined.

a) Type material: Neotype of Cimex claviger Herbst. All the material of Herbst is preserved in the Zoologisches Museum der Humboldt-Universität zu Berlin, but unfortunately the holotype of this species no longer exist in that collection; during my visit there, and with the kind help of Dr N. Göllner-Schneiding, we failed to find even a single specimen of H. clavigera there. Herbst's description is very incomplete and could be applied to any of the Holhymenia species; he did not mention the hind tibia at all, and of the relevant characters he described, the IIIrd segment of antenna as being flat, leaf like and transversally

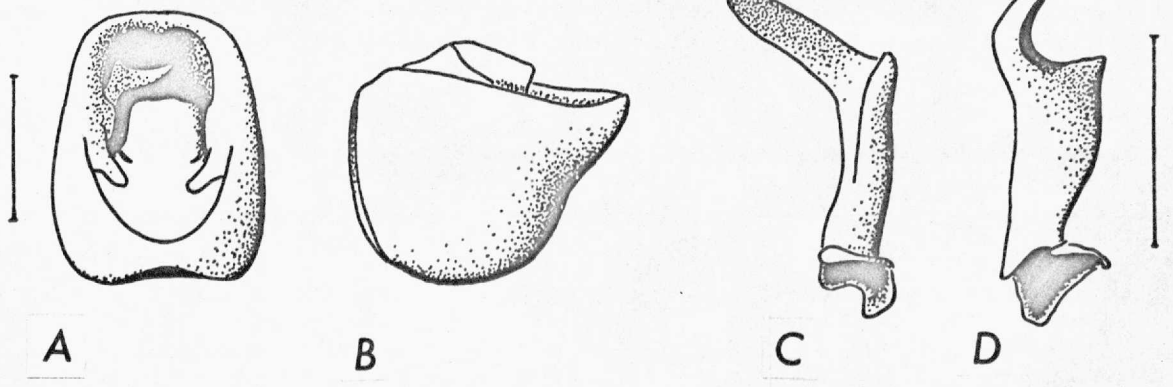
striated; fortunately the description is complemented by an illustration which clearly shows the acute yellowish white spot extended over most of the IIIrd antennal segment, and also the prominent, dark external dilation of hind tibia. Because of close relationships and the confusion of this species with H. costalima it is necessary, in the interest of stability of nomenclature, to designate and neotype; a male specimen of Cimex claviger Herbst from Brasil in MNHN collection was chosen by me as neotype and accordingly labelled. This specimen fully agrees with Herbst's original description and illustration.

Holotype ♀ of Holymenia tibialis Breddin, in DEI collection, labelled "Holymenia tibialis Bredd., Holotypus, Yungas de La Paz, Bolivia, 1000m, H. Rolle, Berlin, S.W. 11, Coll. Breddin". Examination of this specimen revealed that it is identical with H. clavigera and is here formally synonymized with that species.

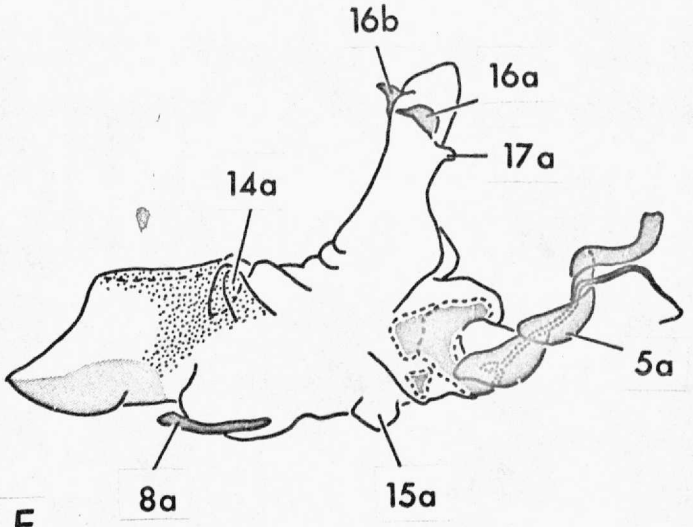
b) Other material: BRASIL: 1 ♀ (MNHN). FRENCH GUIANA: Cayene, 1♀ (MNHN). GUYANA: Potaro, - II - 1908, S.M. Klages, 1 ♀ (BMNH); E. le Moult 1 ♀ (RNH). PERU: Juanjui, Rio Huallaga, 1935, Nagel, 1 ♀ (DEI). SURINAM: 20 - 24 - IX - 1961, 1 ♀ (RNH). VENEZUELA: Bolivar: Gran Sabans, Agua Fria, 28 - X - 1966, J. -B. Bechyne, E. -A. Osuna, 1 ♂ (IZA).

c) Material without data: 1 ♀ labelled "Holymenia intermedia Cat. No. 1", (RNH).

Plate 11



A B C D



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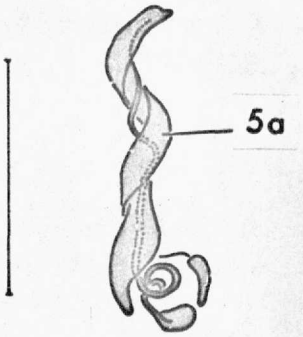
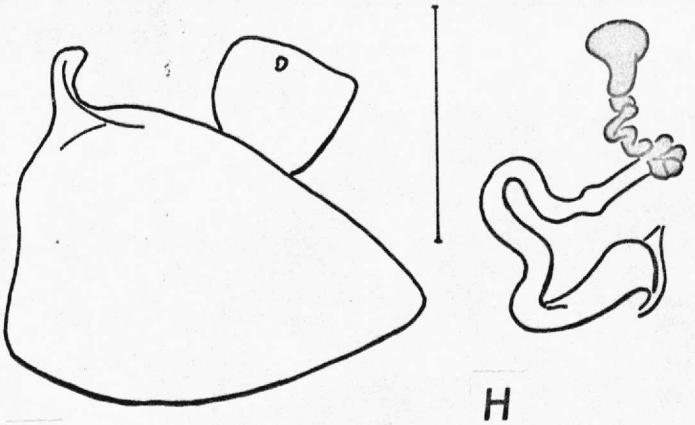


F



G

H

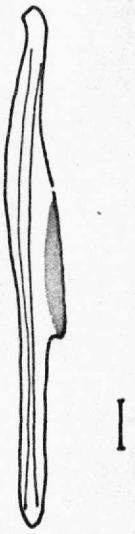


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Table 7 Measurements (3 ♂♂ and 5 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body Length	3	16.0-18.0	17.26	4	19.0-20.0	19.65
2 Head Length	3	2.28-2.33	2.29	5	2.43-2.66	2.53
3 " width	3	2.18-2.33	2.26	5	2.28-2.51	2.37
Distance:						
4 inter-ocular	3	1.21-1.25	1.22	5	1.27-1.36	1.30
5 ante-ocular	3	0.76-0.85	0.82	5	0.91-0.98	0.95
Antennae:						
6 segm. I length	2	2.77-2.85	2.81	5	2.66-2.96	2.87
7 " II "	2	3.16-3.21	3.18	5	3.16-3.64	3.35
8 " III "	2	2.97-3.07	3.02	5	3.02-3.21	3.13
9 " IV "	1	4.89	---	3	4.32-4.70	4.52
Labium:						
10 segm. I length	3	2.41-2.47	2.45	5	2.66-2.85	2.76
11 " II "	3	2.31-2.47	2.39	5	2.66-2.85	2.76
12 " III "	3	0.95-1.12	1.00	4	0.95-1.14	1.05
13 " IV "	3	1.99-2.18	2.09	4	2.26-2.51	2.38
14 Pronotum length	3	2.83-3.21	3.02	5	3.16-3.55	3.32
15 " width	3	3.64-3.88	3.75	5	4.08-4.36	4.20
16 Scutellum length	3	1.93-1.99	1.97	5	1.99-2.28	2.15
17 " width	3	1.38-1.42	1.39	5	1.48-1.67	1.54
18 Hind tibia length	3	8.16-9.12	8.80	4	9.12-10.2	9.61
Tibial dilation:						
19 total width	3	0.76	0.76	4	0.52-0.68	0.58
external part:						
20 length	3	6.09-7.48	6.84	4	6.24-8.16	7.17
21 width	3	0.33-0.43	0.39	4	0.52-0.68	0.58
Ratios: (figures refer to character numbers above).						
1 / 2	3	7.00-7.80:1	7.53:1	4	7.69-8.06:1	7.76:1
1 / 18	3	1.95-1.97:1	1.96:1	4	1.95-2.14:1	2.04:1
2 / 3	3	0.99-1.04:1	1.01:1	5	1.00-1.13:1	1.06:1
6 / 2	2	1.21-1.22:1	1.22:1	5	1.07-1.19:1	1.13:1
13 / 2	3	1.05-1.08:1	1.06:1	4	1.06-1.13:1	1.09:1
9 / 6	1	1.76:1	---	4	1.59-1.62:1	1.57:1
15 / 16	3	1.82-2.01:1	1.90:1	5	1.87-2.05:1	1.95:1
20 / 18	3	74.63-82.01	77.72	4	68.42-81.76	74.60

Holhymenia scenica (Stål), 1865

(Plate 12)

Copium scenica Stål, 1865: 180.1. Holotype ♂ Brasil (NRS) [examined, dissected]

Holymenia scenica (Stål), 1870: 158.5; Lethierry & Severin, 1894: 44

General and differential diagnosis: Size and shape of anterior patch on head; arrow like median longitudinal spot on pronotum; submarginal position of the subtriangular patch on propleura; basal patch on scutellum, and a very distinct patch on dorsum of abdomen. Characteristic features of ♂♂: shape and size of genital capsule and parameres; the shape relative size and position of processes 16a-b; and the shape and size of process 5a. Those of ♀♀: the shape of Ist gonocoxa and the shape and size of spermatheca. H. scenica seems to be an isolated species, showing no close relationships with any other species of Holymenia, although it appears to be somewhat related to H. clavigera and H. costalima as indicated by the brown external tibial dilation, the median longitudinal pronotal spot, posterior margin of genital capsule above level of the lateral ones, and the absence of process 9a-b of conjunctiva.

Description: Head. Dorsal surface black with the following yellowish white markings: anterior patch extending over frons, bases of antenniferous tubercles, tylus and partially over bases and lateral surface of juga, and the neck. Ventral and lateral surfaces and labium yellowish white with the following dark brown to black parts: distal half of antenniferous tubercles, area posterior and below the eye, ventral and anterior margins of juga, as well as the tip of the IVth labial segment. First three antennal segments, and the apex of IVth dark brown to black, most of the IVth segment yellowish white. Tylus decurved, longer than and approximately level with the juga; the latter converging and compressed anteriorly with straight median margins. Labium reaching the middle of IIIrd sternite. Thorax. Pronotum, pleural region, pro and mesosternum basically black, with the following yellowish white markings: On pronotum - arrow like median longitudinal spot, two rounded lateral spots placed slightly behind the level of the median spot, the humeral angles and postero lateral margins. On propleural area - pleura, supracoxal lobes, infrahumeral area and a submarginal wide subtriangular patch on postepimeral flange I. On mesopleura - antero dorsal rounded spot and a wide central patch partially extended over the postepimeral flange II and extending over the supracoxal lobes, but separated from the episternal patch by a narrow black band. On metapleura - peritreme, anterior surface of supracoxal lobe postepimeral flange III and a wide oval patch on the antero-dorsal area of pleura. On prosternum a single median patch; on mesosternum a median longitudinal band. Metasternum yellowish white. Scutellum yellowish white, with the basal

¼ of the whole and basal 2/3rd of margins black. All legs basically cinnamon: Fore leg - coxa yellowish white; femur with internal surface brownish and the proximal end brown. Middle leg - coxa yellowish white; femur with apical 2/3rd orange brown, and the internal narrow strip and proximal tip brown. Hind leg - coxa yellowish white with the anterior surface dark brown to black; anterior proximal margin of trochanter brown; distal 2/3rd of femur orange brown, the proximal end and the internal apical surface brown; tibia with a marginal elongate brown patch in the middle of external dilation. Forewing scarcely punctate at base; the latter dark brown without yellowish white spot. Pronotal calli slightly elevated; humeral angle rounded to subobtuse; pronotal extentions short, subtriangular, near the lateral margins of the base of scutellum. Scutellum without punctures. Hind legs longer than fore and middle legs, hind tibia (fig. I) with a curved not prominent median external dilation. Abdomen. Tergites ochraceous orange to vinnaceous rufous with an elongate patch on the posterior margin of IIIrd tergite, an irregular patch extending over postero-median area of IVth tergite, the scent gland scar and the anterior median margin of Vth tergite, and another irregular patch over the postero-median area of Vth tergite, the second scent gland scar and anterior median margin of VIth tergite, dusky brown; Ist tergite and connexivum of IInd and IIIrd segments dark brown to black; posterior half of IInd tergite dark brown; connexivum of segments IV to VI with brownish margins. Sternites, Ist gonocoxa, laterotergite in females, and genital capsule in males, orange brown to reddish orange; lateral areas of IInd sternite, a wide patch on the antero lateral half of IIIrd sternite, circumspiracular areas, and usually the posterior

margins of sternites III to VI, yellowish white.

Male genitalia: Genital capsule (fig. A,B) - posterior margin rounded and slightly above lateral margins, the latter slightly concave. Parameres (fig. C,D) - shaft with dorsal carina extending to the tip of the outer lobe, which is flatten laterally; shank gently curved, flat and thin. Phallus (fig. E): phallotheca dorsally and laterally very slightly sclerotized, with processes 14a-b rounded and slightly sclerotized; conjunctiva with dorsal sac of moderate size, and armed with the following processes: 16a-b heavily sclerotized and spinose, 15a-b very wide and prominent and 5a (fig. E,F) with the third convolution tightly coiled.

Female genitalia: Ist gonocoxa and VIII laterotergite as shown in fig. G; spermatheca (fig. H) tubular, with a wide base, becoming gradually tapering towards the apex.

Measurements and Ratios: (see table 8)

Geographical distribution: Only known from localities on banks of Amazon River in Brasil.

Discussion: The most important variation observed in the examined material, were as follow: in one male and one female, the antero dorsal spot on mesopleura was very inconspicuous, and the single median spot on prosternum very reduced.

Material examined.

a) Type material: Holotype ♂ of Copium scenica Stål, from Brasil, Amazon in the NR collection, labelled "Typus, Amazon, Stevens".

b) Other material: BRASIL: Santarem, 1 ♂ (BMNH); Amazonas, 1 ♂ (BMNH); Amazonas, Taperinha, Santarem, 11 - 20 - VI - 1927, Zerny, 1 ♀ (NM); Santarem, June 1919, S.M. Klages, 1 ♀ (CM).

Plate 12

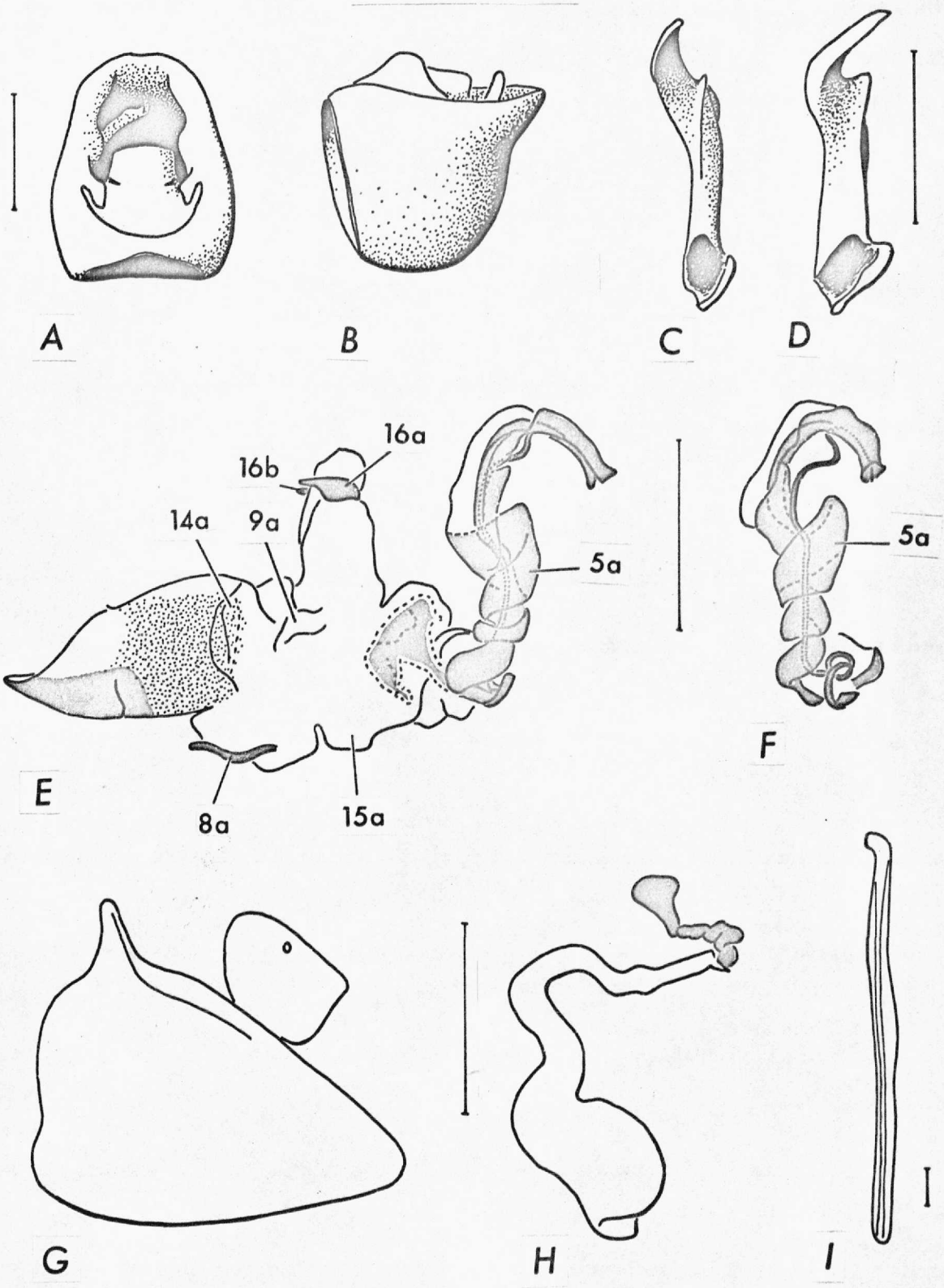


Table 8 Measurements (2 ♂♂ and 3 ♀♀, from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	2	15.0–15.3	15.1	3	17.5–18.0	17.8
2 Head length	2	2.09–2.47	2.28	3	2.37–2.56	2.46
3 " width	2	1.91–2.09	2.00	3	2.14–2.26	2.19
Distance:						
4 inter-ocular	2	1.08–1.14	1.11	3	1.17	1.17
5 ante-ocular	2	0.95	0.95	3	0.95–0.98	0.96
Antennae:						
6 segm. I length	2	2.09–2.22	2.15	3	2.28–2.37	2.34
7 " II "	2	2.40–2.59	2.49	3	2.64–2.73	2.67
8 " III "	2	2.40–2.64	2.52	3	2.64–2.73	2.67
9 " IV "	1	3.65	3.65	3	4.22–4.51	4.33
Labium:						
10 segm. I length	2	2.31–2.49	2.40	3	2.64–2.71	2.67
11 " II "	2	2.28–2.51	2.39	3	2.66–2.81	2.74
12 " III "	2	0.87–0.95	0.91	3	0.85–0.95	0.89
13 " IV "	2	2.01–2.28	2.14	3	2.24–2.49	2.34
14 Pronotum length	2	2.54–2.88	2.71	3	3.10–3.16	3.13
15 " width	2	3.36–3.64	3.50	2	4.03–4.27	4.15
16 Scutellum length	2	1.86–1.90	1.88	3	2.18–2.29	2.25
17 " width	2	1.36–1.42	1.39	3	1.44–1.61	1.52
18 Hind tibia length	1	7.44	7.44	2	8.01–8.64	8.32
Tibial dilation:						
19 total width	1	0.56	0.56	2	0.62–0.80	0.71
external part:						
20 length	1	4.80	4.80	2	6.24–6.48	6.36
21 width	1	0.28	0.28	2	0.28–0.43	0.35
Ratios: (figures refer to character numbers above).						
1 / 2	2	6.19–7.17:1	6.64:1	3	7.03–7.38:1	7.24:1
1 / 18	1	2.05:1	2.05:1	2	2.08–2.24:1	2.14:1
2 / 3	2	1.09–1.18:1	1.14:1	3	1.04–1.17:1	1.12:1
6 / 2	2	0.89–1.00:1	0.94:1	3	0.89–1.00:1	0.95:1
10 / 2	2	1.00–1.10:1	1.05:1	3	1.03–1.11:1	1.08:1
9 / 6	1	1.64:1	1.64:1	3	1.78–1.97:1	1.85:1
15 / 16 %	2	1.80–1.91:1	1.86:1	2	1.84–1.86:1	1.84:1
20 / 18 %	1	64.5	64.5	2	72.2–80.8	76.4

TARPEIUS Stål

(Plate 13)

Copium Thunberg: Stål, 1865: 181.3

Tarpeius Stål, 1867: 544. Type - species: Copium brevicorne Stål, 1867, by monotypy.

Tarpeius Stål: Lethierry ' Severin, 1894: 44.

Copius Burmeister: Walker, 1871: 155

Diagnosis: (based on T. brevicornis the only one included species). Body small and elongate. Head. Basically cinnamon, with light brown to brown markings; first two antennal segments basically cinnamon, with brown markings, IIIrd segment brown, IVth segment yellowish white with brown tip. Longer than wide, slightly declivent, slightly depressed behind oceli, with tylus and juga below the level of antenniferous tubercles; Ist antennal segment shorter than head, IInd with small foliation on the distal part of anterior face, IIIrd segment with wide foliation on both sides of the main shaft. Thorax. Basically cinnamon; most of tho dorsal and lateral surfaces with brown punctures. Pronotum gradually declivent and punctated, calli indistinctly separated from each other and with different sculpture than the disk; lateral margins straight, slightly protruding and slightly tuberculate; humeral areas raised and deflected towards the horizontal humeral angles, postero

lateral margins slightly curved and entire; posterior margin abruptly depressed with inconspicuous rounded pronotal extensions. Scutellum slender, flat and punctate, with long and thin marginal ridges; antero-internal surface of apical half of femur of all legs armed with a single row of 3 to 5 distally inclined spines, the spines gradually increasing in size towards the apex; hind tibia (fig. I) with inconspicuous external dilation extended over most of the length of tibia. Fore wing with basal 2/3rd coriaceous and punctate; corium and clavus cinnamon with brown punctures; membrane transparent. Abdomen Sternites cinnamon, with some brownish marks.

Male genitalia: Genital capsule (fig. A,B) - with subproctigeral sac; posterior and lateral margins compact and entire; ventral ridge semioval, depressed medially. Parameres (fig. C,D) - shaft straight, shank simple, curved latero-postero-dorsally, and sharply projecting from the main shaft. Phallus (fig. E) with phallotheca slightly sclerotized dorsally and laterally; conjunctiva armed with the following processes: 16a-b heavily sclerotized and spinose; 9a-b membranous and flat; 8a-b horizontal and flat; 5a (fig. E,F) slender, with three convolutions and short tip.

Female genitalia: Spermatheca (fig. H) tubular, simple, without duct dilation and not swelled base; spermathecal bulb capitate.

Pubescense: Body basically bare, with some microscopic hairs on head and thorax; and small very thin hairs on coxae and sternites, those on the latter, becoming more dense and longer on posterior segments.

Tarpeius brevicornis Stål, 1865

(Plate 13)

Copium brevicorne Stål, 1865: 181.3 Holotype ♂, Brasil (NR) [examined, dissected]

Copium brevicorne Stål: Stål, 1867: 544

Tarpeius brevicornis (Stål): Stål, 1870: 158.1; Lethierry & Severin, 1894: 44

Copius brevicornis Stål: Walker, 1871: 155.8

General and differential diagnosis: IInd antennal segment with small anterior foliation; IIIrd segment widely foliaceous; median longitudinal cinnamon band on pronotum and scutellum. Characteristic features of ♂♂: shape and size of genital capsule and parameres, the shape and degree of development of processes 9a-b and the shape and size of process 5a. Those of ♀♀: the shape of first gonocoxa and the shape and size of spermatheca.

Description: Head. Basically cinnamon, with the following light brown to brown markings: On dorsal surface - a patch extending over frons, tylus and median half of juga, a median depressed postfrontal longitudinal patch, and a pair of narrow longitudinal stripes between the ocelli. On lateral surface - ventral margin of juga; most of buccula; distal most part of antenniferous tubercles; below the latter a patch continuous with another longitudinal patch which extends over the genae

from buccula to the neck; a dorsal patch posterior to the eye. On ventral surface - the gular area which may be extended laterally up to the genal patch. Tip of IVth labial segment, black. Ist antennal segment cinnamon, with the ventral apical half brownish, and posterior surface with an elongate light brown patch; IInd segment basically cinnamon, with apical $\frac{1}{4}$ and the anterior foliation, brown; IIIrd segment brown; IVth segment yellowish white with brown apex. Tylus deflected, longer than, and slightly below the level of juga; the latter slightly bulging laterally with rounded tips, straight median margin and slightly curved lateral margin. Labium almost reaching the IVth sternite. Thorax. Basically cinnamon; the surface of pronotum, pleural region, scutellum and coriaceous part of fore wing with dense brown punctures, except the following distinct smooth areas: On pronotum - calli, a narrow median longitudinal band extending from collar to the posterior margin, humeral angles, and the lateral and posterior margins. On propleural area - pleural calli. On metapleura - evaporative area around the peritreme. On scutellum - longitudinal median band. Calli mottled with brown. The following parts are brown to dark brown: On propleura - narrow sometimes linear dorsal border of pleural calli. On fore wing - vein Pcu, anal margin of clavus, the vein R, part of veins M and Cu and the x-vein m-cu which form together somewhat distorted "H" shaped feature. All legs basically cinnamon: Fore and middle legs - external surface of coxa yellowish white; femur with wide brownish transverse band across the middle of the anterior, internal and posterior surfaces, and with brown apical parts of anterior external and posterior surfaces; tibia with

two annular brownish patches, one at base and the other approximately in the middle of tibia. Hind leg - external surface of coxa with some orange colouration; femur and tibia as in fore and middle legs. Pronotal calli slightly elevated; humeral angles obtuse or subacute; pronotal extensions inconspicuous wide and triangular, somewhat bent outward. Hind legs longer than fore and middle legs; hind tibia (Fig. I) with an inconspicuous external dilation extended over most of the length of tibia. Abdomen. Tergites ochraceous orange; connexivun brown with the anterior half of each segment yellowish white. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males cinnamon, lateral areas of sternites with some brownish patches which become smaller and less numerous posteriorly.

Male genitalia: Genital capsule (fig. A,B) - posterior margin above the level of lateral margin, slightly notched in the middle; lateral margins descending posteriorly and then ascending near, and toward the posterior margin. Paramere (fig. C,D) - outer lobe very conspicuous with blunt tip, shank flat, curved at base and straight distally, with acute tip. Phallus (fig. E): phallotheca dorsally and laterally slightly sclerotized with processes 14a-b rounded and very slightly sclerotized; conjunctiva with an elongate dorsal sac, terminating in an antero distal lobe; conjunctiva armed with the following processes: 16a-b, heavily sclerotized and spinose; 9a-b, membranous, small and flat; 8a-b, narrow and sinuate, with acute tip; 5a (fig. E,F) with the third convolution rather more coiled than the rest.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular, with a very wide and prominent base, and tapering toward the apex.

Measurements and Ratios: (see table 9)

Geographical distribution: (Map 4) Only known from several localities on the banks of Amazonas River and its tributaries in Brasil and Peru.

Habitat and Biology: During the dissections fully developed eggs were found in two females, unfortunately there was no date of collection on the labels; the eggs are cupuliforms, length 1.90mm, width 1.14mm, height 1.44.

Discussion: The characters of this species, including colouration, appear to be generally very constant, but two females showed rather striking differences in the colour pattern, namely: brown patches on head considerably darker; pronotum with lateral areas adjacent to the median longitudinal band uniformly dark brown; hind tibia without brownish patches; all veins of the fore wing brown; Ist tergite, posterior margin of IInd and the median part of the posterior margin of IIIrd tergite, as well as the scent gland scars brownish; sternites orange brown except the median part of the IInd and IIIrd. But these two females had the same type of spermatheca, which is considered a most important indication of conspecifity. The study of further material, when available, may justify subspecific status for this form. Other variations observed were: 1 ♂ and 2♀♀ showed pointed juga, in another ♂ the elongate patch on posterior surface of Ist antennal segment was absent; another ♀

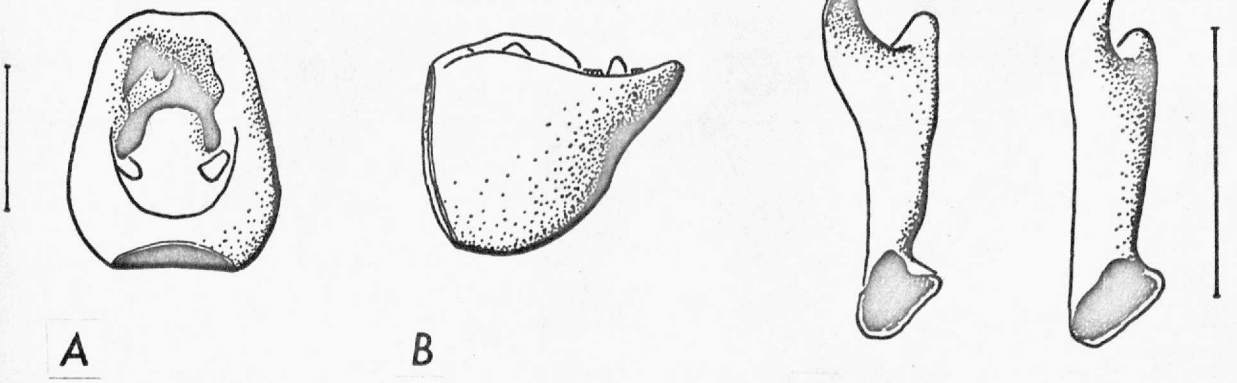
had the spermatheca comparatively longer with two recurrent curves near the base.

Material examined.

a) Type material: Holotype ♂ of Copium brevicorne Stål, from Brasil, Amazon, no date, Stevens, labelled "Typus Amazon, Stevens" preserved in NR collection.

b) Other material: BRASIL: Ega, 1 ♂ (BMNH) Amazon sup., Olivenca, 1 ♀ (NR); Manaos, 20 - X - 1924, Melin, 1 ♀ (IZA); R. Uaupes, Taracua, 10 - III - 1924, Roman, 1 ♂ (IZA). PERU: Amazon sup., Pebas, 2 ♂, 1 ♀ (NR); Pachita, 1 ♀ (NR).

Plate 13

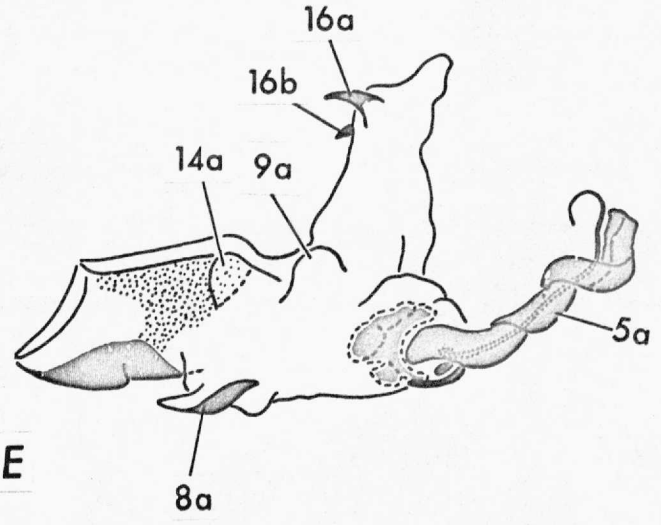


A

B

C

D



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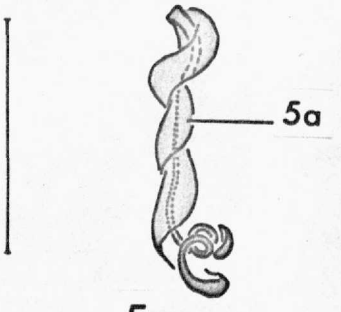
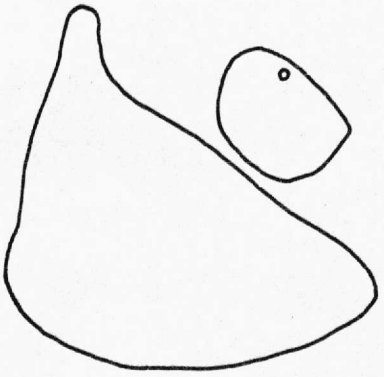
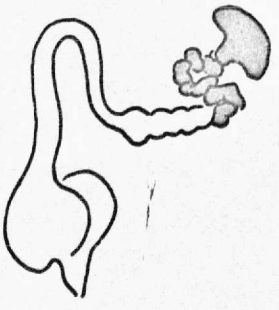


F



G



H

I

Table 9 Measurements (4 ♂♂ and 5 ♀♀ from 6 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	11.5-12.7	12.28	4	13.4-13.9	13.6
2 Head length	4	2.03-2.26	2.11	5	2.12-2.28	2.20
3 " width	4	1.67-1.76	1.72	5	1.76-1.88	1.82
Distance:						
4 inter-ocular	4	0.91-1.00	0.96	5	1.00-1.08	1.02
5 ante-ocular	4	0.77-0.95	0.89	5	0.85-0.96	0.93
Antennae:						
6 segm. I length	4	1.57-1.71	1.65	5	1.52-1.90	1.67
7 " II "	4	1.89-2.09	1.98	5	1.82-2.18	1.99
8 " III "	4	1.09-2.56	2.06	5	2.26-2.56	2.40
9 " IV "	4	2.85-3.23	3.03	5	2.85-3.45	3.11
Labium:						
10 segm. I length	4	1.88-2.08	1.96	5	2.03-2.28	2.14
11 " II "	4	1.90-2.09	1.98	5	2.03-2.09	2.07
12 " III "	4	0.76-0.85	0.79	5	0.79-0.85	0.83
13 " IV "	4	1.88-2.28	2.11	5	2.05-2.28	2.20
14 Pronotum length	4	2.37-2.69	2.58	5	2.66-2.88	2.73
15 " width	4	3.26-3.76	3.57	5	3.51-4.27	3.87
16 Scutellum length	4	1.65-1.90	1.77	5	1.80-2.07	1.91
17 " width	4	1.25-1.52	1.34	5	1.33-1.52	1.41
18 Hind tibia length	4	50.4-60.0	5.62	5	5.95-6.52	6.30
Tibial dilation:						
19 total width	4	0.36-0.47	0.40	5	0.41-0.47	0.45
external part:						
20 length	-	—	-	-	—	—
21 width	4	0.15-0.24	0.19	5	0.17-0.22	0.19
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.61-5.98:1	5.81:1	4	5.87-6.55:1	6.20:1
1 / 18	4	2.06-2.28:1	2.18:1	4	2.05-2.25:1	2.16:1
2 / 3	4	1.20-1.28:1	1.22:1	5	1.12-1.29:1	1.20:1
6 / 2	4	0.75-0.81:1	0.71:1	5	0.71-0.84:1	0.75:1
10 / 2	4	0.90-0.95:1	0.92:1	5	0.91-1.01:1	0.97:1
9 / 6	4	1.74-1.88:1	1.83:1	5	1.67-2.12:1	1.86:1
15 / 16 %	4	1.94-2.08:1	2.01:1	5	1.92-2.11:1	2.02:1
20 / 18 %	-	—	—	-	—	—

BALDUS Stål

(Plate 14)

Copium Thunberg: Stål, 1865: 1,81.3

Baldus Stål, 1867: 544. Type - species: Copium vinulum Stål, 1865, by monotypy.

Copius Burmeister: Walker, 1871: 154.

Diagnosis: (Based on B. vinulum the only one included species). Body medium sized, elongate. Head. Basically cinnamon, with dark brown to black markings; first two antennal segments cinnamon, the IInd with apex brown, IIIrd brown, and the IVth yellowish white with brownish apex. Longer than wide, declivent, slightly depressed behind the ocelli, with tylus and juga deflected and below the level of antenniferous tubercles; Ist antennal segment longer than head, IInd segment cylindrical and elongate, IIIrd segment foliaceous on both sides of the main shaft forming together an oval foliation. Thorax. Basically dark red with yellowish white markings. Pronotum strongly declivent and punctated; calli indistinctly separated from each other, with similar sculpture as the disk; lateral margins slightly sinuous and slightly tuberculate; postero lateral margins straight and slightly tuberculate; humeral areas prominent, raised towards the obliquely ascending humeral angles; posterior margin abruptly depressed with small pronotal extensions; scutellum

slender, not punctated, with short shallow depression near the apex, bordered by short marginal ridges. Apex of femur armed with one or two spines; hind tibia (fig. I) with not very prominent external dilation extending over most of the length of tibia. Fore wing with corium sparsely punctate, black with yellowish white markings. Abdomen. Sternites with anterior half of lateral margins and circumspiracular areas yellowish white.

Male genitalia: No male specimens were available for study,

Female genitalia: Spermatheca (fig. H) tubular, simple, without duct dilation and not swollen base; spermathecal bulb capitate.

Sculpture: Pronotum and pleural region with both shiny and dull areas; the shiny areas distributed as follows: On pronotum - humeral and lateral areas, and a median longitudinal band and the calli. On propleural area - pleura, supracoxal lobes and dorsal half of posteprneral flange I. On mesopleura - pleura and episternal supracoxal lobe. The whole of metapleura, except the evaporative area above and below the peritreme.

Pubescence: Body bare, with some small very thin hairs on all coxae and on median area of abdominal sternites.

Baldus vinulus (Stål), 1865

(Plate 14)

Copium vinulum Stål, 1865: 181.2 Holotype ♀, Brasil (NR) [examined, dissected]

Copium vinulum Stål: Stål, 1867: 544

Baldus vinulus (Stål): Stål, 1870: 158.1; Lethierry & Severin 1894: 45

Copius vinulus Stål: Walker, 1871: 154.7

Description: (based only on females). Head. Basically cinnamon, with the following dark brown to black markings: On dorsal surfaces - wide patch between the eyes; and the inner margin of juga. On lateral and ventral surfaces and on labium - anterior and ventral margin of juga, small patch below antenniferous tubercles, elongate patch below the eye; central area of gula, and the tip of IVth labial segment. Ist and IInd antennal segments cinnamon; apex of IInd and the whole of IIIrd brown; IVth segment yellowish white, with brownish apex. Tylus deflected, longer than and slightly below the level of juga; the latter swollen laterally below antenniferous tubercles, flattened antero-laterally, with straight inner margin. Labium reaching the middle of IIIrd sternite. Thorax. Basically dark red, with yellowish white and black markings as follow: yellowish white: On propleura - episternal supracoxal lobe.

On mesopleura - episternal supracoxal lobe and a central round patch. On metapleura - anterior and posterior processes of peritreme, oval central spot; and a patch extending over postepimeral flange III and supracoxal lobe. Black markings: On prothorax - collar, central spot on prosternum and a patch extending over humeral areas, postero and postero lateral margin as well as infra-humeral area. On mesothorax - mesonotum and dorsal margin of pleura. On metathorax - the metanotum. Metasternum cinnamon to reddish. Scutellum cinnamon, with a black narrow pointed median band, extending from base to half its length. All legs basically cinnamon. Coxa of fore and middle legs dark red to dark brown, with the inner face pale brown to cinnamon. Hind leg - coxa dark red to dark brown, with inner face reddish orange; distal 2/3rd of femur orange brown. Corium and clavus black, the former with the following yellowish white markings: elongate marginal patch at base, a central oval longitudinal patch, a transverse oval patch posterior to n-cu vein, and an elongate patch on distal margin of corium extending up to costal margin; membrane dull black. Pronotum with anterior median depression; calli slightly elevated; humeral angles prominent subacute to acute and raised; pronotal extensions triangular, short and wide, with diverging tips. Hind legs much longer than fore and middle legs; hind tibia (fig. I) with elongate posterior dilation, extending over most of the length of tibia. Abdomen. Tergites ochraceous with the following chestnut-brown markings: subtriangular patch on IIIrd tergite, an irregular patch extending over median-posterior area of IVth tergite, the scent gland scar and anterior median margin of Vth tergite, a patch on median posterior margin of Vth tergite, and on the second scent gland scar,

posterior margin of VIth tergite, and median posterior margin of the VIIth; Ist and IInd tergite black; connexivum ochraceous with the posterior half of each segment black to brown, becoming paler posteriorly. Sternites, Ist gonocoxa and laterotergite orange brown to reddish orange; lateral area of IInd sternite darker; anterior half of lateral margin and circunspiracular area, as well as the posterior margin of IVth and Vth sternites yellowish white.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and laterotergite as shown in Fig. G; spermatheca (fig. H) with bulging base, becoming narrow towards the apex.

Measurements and Ratios: (see table 10)

Geographical distribution: (Map 4). Only known from Brasil, Sao Paulo and Amazonas.

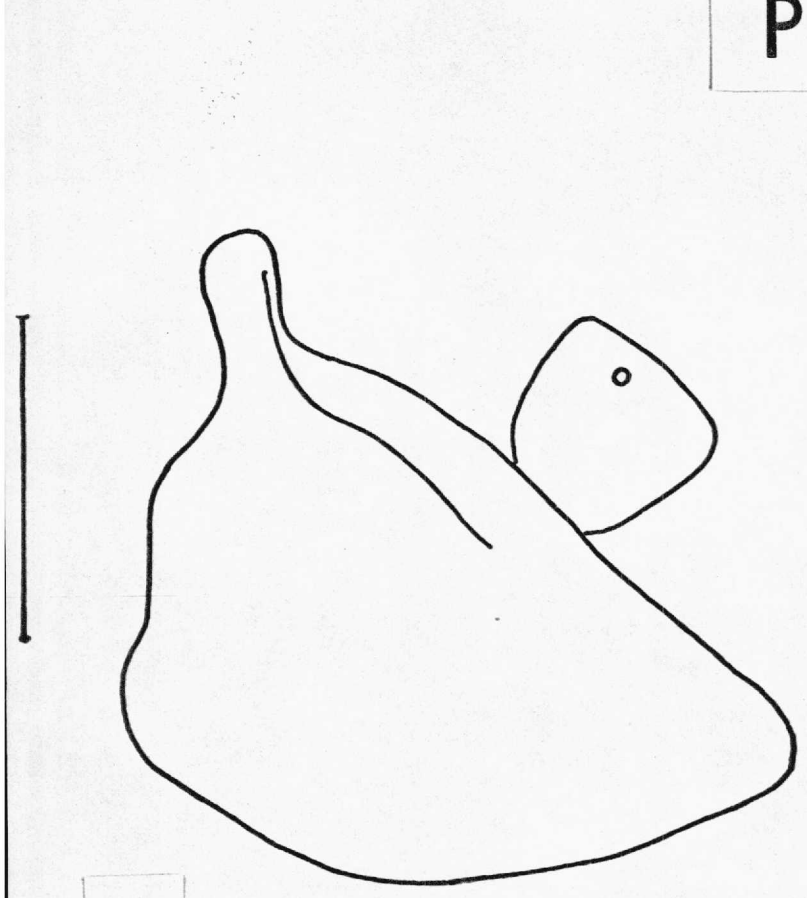
Discussion: The most important variation observed in the examined material were as follow: black patches on gula and prosternum, were vestigial in one specimen; curve "d" of spermatheca in one specimen was considerably more broadly curved than shown in fig. H.

Material examined.

a) Type material: Holotype ♀ of Copium vinulum Stål, from Brasil, Amazonas, in NR collection, labelled "Typus, Amazon, Stevens."

b) Other material: BRASIL: Sao Paulo, 2 ♀ (BMNH)

Plate 14



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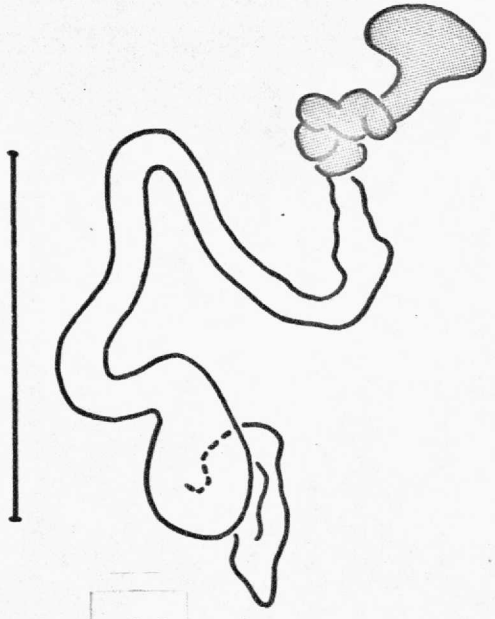

H

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Table 10 Measurements (3 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	–	—	—	2	16.6–18.0	17.3
2 Head length	–	—	—	3	2.18–2.37	2.27
3 " width	–	—	—	3	2.24–2.28	2.26
Distance:						
4 inter-ocular	–	—	—	3	1.19–1.23	1.21
5 ante-ocular	–	—	—	3	0.91–0.98	0.93
Antennae:						
6 segm. I length	–	—	—	3	3.04–3.13	3.07
7 " II "	–	—	—	3	3.02–3.16	3.10
8 " III "	–	—	—	3	3.55–3.74	3.64
9 " IV "	–	—	—	2	4.22	4.22
Labium:						
10 segm. I length	–	—	—	3	2.28–2.39	2.34
11 " II "	–	—	—	3	2.09–2.47	2.29
12 " III "	–	—	—	3	0.89–0.95	0.93
13 " IV "	–	—	—	3	1.69–1.91	1.83
14 Pronotum length	–	—	—	3	3.16–3.26	3.21
15 " width	–	—	—	3	4.70–5.32	5.02
16 Scutellum length	–	—	—	3	2.33–2.47	2.39
17 " width	–	—	—	3	1.71–1.99	1.83
18 Hind tibia length	–	—	—	3	9.55–10.1	9.90
Tibial dilation:						
19 total width	–	—	—	3	0.56–0.80	0.66
external part:						
20 length	–	—	—	3	8.49–9.26	8.79
21 width	–	—	—	3	0.33–0.48	0.39
Ratios: (figures refer to character numbers above).						
1 / 2	–	—	—	2	7.00–7.89:1	7.62:1
1 / 18	–	—	—	2	1.64–1.78:1	1.74:1
2 / 3	–	—	—	3	0.95–1.05:1	1.00:1
6 / 2	–	—	—	3	1.28–1.39:1	1.35:1
10 / 2	–	—	—	3	0.77–0.83:1	0.80:1
9 / 6	–	—	—	2	1.34–1.38:1	1.37:1
15 / 16 %	–	—	—	3	2.01–2.15:1	2.10:1
20 / 18 %	–	—	—	2	84.2–91.8	88.7

CHONDROCERA Laporte

(Plates 15-16)

Chondrocera Laporte, 1832: 44. Type-species: Chondrocera laticornis Laporte, 1832, by monotypy.

Petalotoma Guérin-Méneville, 1867: 389, pl. 13, fig. 8. Type-species: Petalotoma unicolor Guérin-Méneville, 1857, by monotypy.

Diagnosis: Small to medium sized, elongate species. Head. Basically yellow ochre, with light brown markings; antenna dark red or yellow ochre with brown markings. Longer than wide, not declivent, not depressed behind the ocelli, with tylus and juga above the level of antenniferous tubercles, tylus not deflected; Ist antennal segment somewhat longer than head, antennal segments II to IV cylindrical, thin and elongate, the IInd and IIIrd with or without flat lateral expansions. Thorax. Basically yellow ochre, with brown or brownish markings; area between humeral angles and scutellum with blue-green or silver metallic shine due to numerous microscopic shiny dots. Pronotum declivent and punctated, calli indistinctly separated from each other, and differently sculptured than the disk; lateral margins protruding, slightly curved and entire; humeral areas prominent, level with the horizontal humeral angles; postero lateral margins somewhat sinuate and weakly tuberculate; posterior

margin depressed, without pronotal extensions; scutellum short strongly punctate, without marginal ridges or central depression; apex of femora armed with one or two spines; hind tibia (fig. I) with external and internal dilations, the external sinuous and longer than the internal one. Corium punctate, brown or brownish with blue-green or silver metallic shine, similar to that of pronotum and scutellum; membrane transparent. Abdomen. Sternites yellow ochre.

Male genitalia: Genital capsule (Fig. A,B) - with subproctigeral sac; posterior and lateral margins compact and entire ventral ridge semioval. Parameres (fig. C,D) - shaft medially curved, shank simple and curved latero-postero-dorsally, projecting sharply from main shaft. Phallus (fig. E) with phallotheca slightly sclerotized dorsally and laterally, conjunctiva armed with the following processes: 16a-b heavily sclerotized and spinose; 9a-b membranous and flat; 8a-b horizontal and flat; 5a (fig. E,F) slender with the two usual tightly coiled proximal convolutions and the third one either open, but complete or straight rather long and only slightly curved at the apex.

Female genitalia: Spermatheca (fig. H) short and small, swollen medially, small at base becoming tubular distally; spermathecal bulb elongate.

Sculpture: Pronotum, scutellum and coriaceous part of fore wing strongly punctate, some punctures on the latter two parts and between humeral angles of pronotum with bright blue-green or silver metallic shine. Pleural region with some shiny and dull areas; the shiny areas

are distributed as follow: On propleural area - supracoxal lobes and ventral half of postepimeral flange I. On mesopleura - supracoxal lobes and the whole postepimeral flange II. On metapleura - supracoxal lobe and the whole postepimeral flange III.

Pubescence: Body almost entirely bare, except for some microscopic hairs on sternites and very thin and short hairs on genital segments.

KEY TO SPECIES

1. Antenna dark red, IInd and IIIrd segment with flat lateral expansions; dorsum with silver shine; conjunctiva without additional sclerotization; process 5a (fig. E,F) with third convolution long, straight and incomplete.. ..... laticornis (p.137)

2. Antenna yellow ochre with brown markings, all antennal segments cylindrical; dorsum with blue-green metallic shine; conjunctiva with additional sclerotization; process 5a (fig. E,F) with third convolution elongate but complete..... signoreti (p.143)

Chondrocera laticornis Laporte, 1832

(Plate 15)

Chondrocera laticornis Laporte, 1832: 45, pl. 53. Holotype, Cuba (lost).

Petalotoma unicolor Guérin-Méneville 1857: 389, pl. 13, fig. 8. 2 syntipes, Cuba, Havana (lost) [Synonymized by Stål 1870: 158]

General and differential diagnosis: Antenna dark red; IInd and IIIrd segments with flat lateral expansions; pronotal calli not elevated; dorsum with silver reflections. Characteristic feature of ♂♂: shape and size of genital capsule and parameres, absence of processes 15a-b, and the shape and size of process 5a. Those of ♀♀: the shape of Ist gonocoxa and the shape and size of spermatheca.

Description: Head. Basically yellow ochre; a pair of longitudinal patches between the ocelli; and a band behind the eye light brown. Ist labial segment yellow ochre, the other segments light brown to brown becoming darker distally. All segments of antenna dark red, the IVth paler in some specimens. Tylus prominent, blunt, above the level of, and projecting anteriorly beyond juga, forming distally a prominent ridge between the latter; juga converging anteriorly, with curved median and lateral margins. IInd and IIIrd antennal segments with flat expansions on both anterior and posterior sides of the distal $\frac{3}{4}$ of the main shaft.

Labium variable in length, reaching the anterior margin of IInd sternite up to the posterior margin of the IVth. Thorax. Area behind the humeral angles of pronotum, scutellum and corium brownish with silvery shine; most of pronotum, pleural and sternal areas yellow ochre, with the following brownish parts: small patch medial to calli and a band dorsal to pleural calli. All legs basically yellow ochre, with distal half of fore and middle femora slightly darker and tibia and tarsus will microscopic reddish spots. Hind leg - distal half of femora darker than the rest of the leg; anterior surface of tibial dilation yellow ochre, posterior surface yellow ochre, irregularly marked with light brown, and the microscopic red spots; distal margin of internal dilation brown. Pronotal calli not elevated; humeral angles spinose. Hind legs longer than fore and middle legs, hind tibia (fig. I) with concave filiaceous external and internal dilations, the external one sinuous, extending over most of length of tibia. Abdomen: Tergites ochraceous orange, connexivum brownish, the anterior margin of each segment paler. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - posterior margin notched medially, and below the level of lateral margins, the latter horizontal and elevated behind the level of proctiger, then descending towards the posterior margin; the raised portion bears a medially directed protuberance. Paramere (fig. C,D) - shaft slightly curved medially, without dorsal carina, outer lobe conspicuous and bent laterally; shank flat, curved basally and straight distally with an acute tip. Phallus

(fig. E): phallotheca dorsally and laterally moderately sclerotized, with processes 14a-b, membranous, rounded, not prominent and in a more lateral than usual position; conjunctiva with an elongate and wide dorsal sac, ending in a large antero-distal lobe; the former armed with the following processes: 16a-b heavily sclerotized, slender and spinose; 9a-b membranous, small and flat; 8a-b narrow and sinuate but very conspicuous, with blunt tips; 5a (fig. E,F) with two distinct convolution, the third incomplete, beyond a large straight portion.

Female genitalia: Ist gonocoxa and VIII laterotergite as shown in fig. G; spermatheca (fig. H) short, with a basal curved tube, followed by a large swollen portion which becomes tubular distally.

Measurements and Ratios: (see table 11)

Geographical distribution: (Map 4). Limited to the Antilles, most of the records being from Cuba, but is also present on the Caiman Is.

Habitat and Biology: Fully developed eggs were found in two dissected females; these were collected in October and November; the eggs are cupuliforms, length 1.57mm, width 0.89mm, height 0.87mm.

Material examined

a) Type material: The holotype of Chondrocera laticornis Laporte was believed to be in the collection of the Museum National in Paris, but no specimens of this species were found in that collection and the location of the type is not known. No neotype is here designated, because it is a well defined and distinct species, and the stability of this taxon

can be therefore maintained without a designated type. (Art. 75b of the International Code of Zoological Nomenclature).

b) Other Material: ANTILLAS: Cuba, Cochinos Bay, - IX - 1929, J.G. Mayers. 1 ♂, 1 ♀ (BMNH); Cuba, Uhler, 1 ♀ (NM); Cuba, 1 ♂, 1 ♀ (NM); Cuba, 1 ♀ (NMHU); Cuba, 2 ♀ (NR); Cuba, Habana, Venado, 1928, A. Bierig, 1 ♀ (DEI); Cuba, Trinidad Mts., - IX - 1929, 1 ♂, 1 ♀ (BMNH); Cuba, Guantanamo, Le Moult, 1 ♂ (RNH); Jamaica, C.B. Taylor, 1 ♀ (BMNH); Cayman Is., 19 - V - 1938, Oxf. Un. Biol. Exped., C.B. Lewis, G.H. Thompson, on Cotton tree, 1 ♂ (BMNH), St. Thomas, Hampton Court, 27 - II 0 1952, R.P. Bengly, 1 ♂ (BMNH).

Plate 15

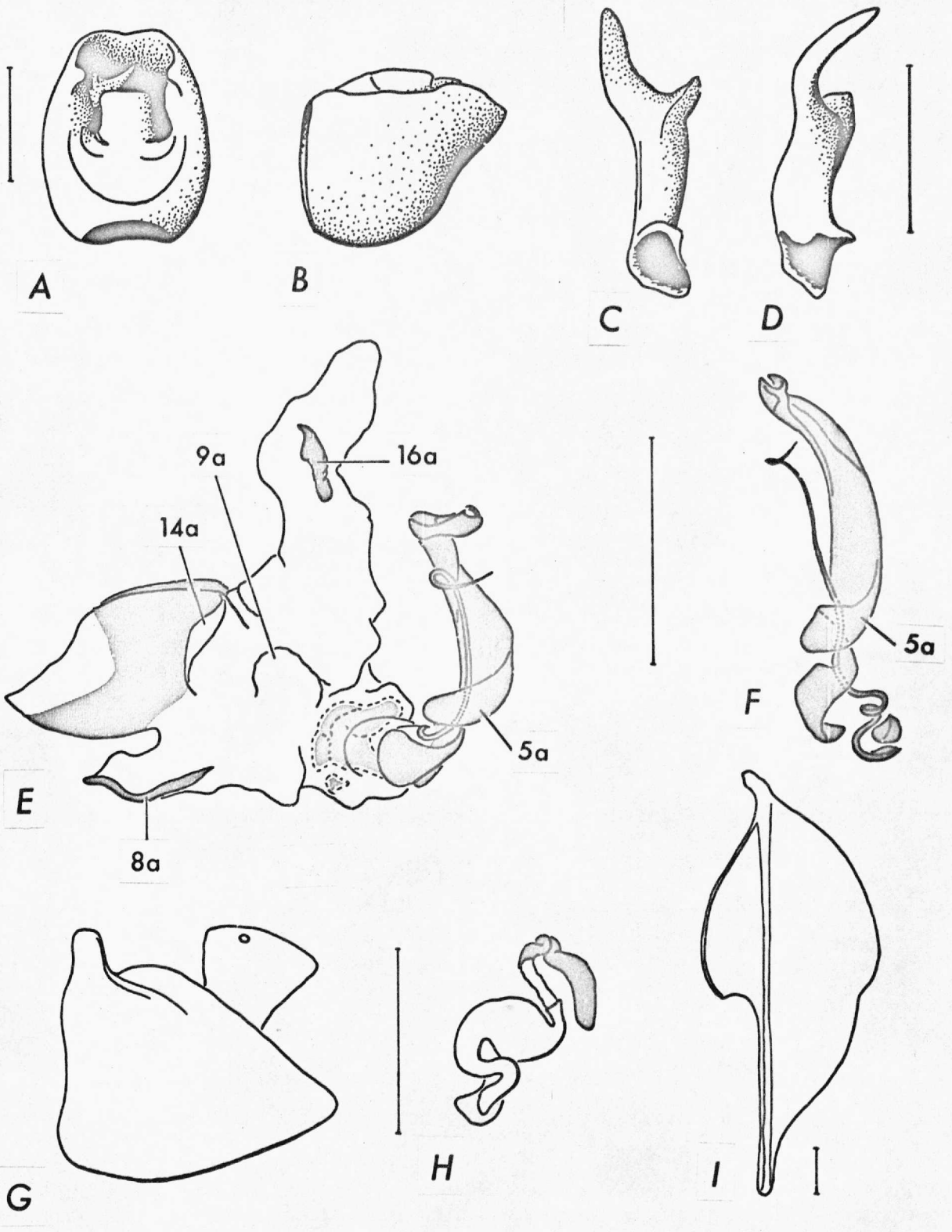


Table 11 Measurements (5 ♂♂ and 5 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	10.5–14.0	12.42	5	13.4–16.0	15.0
2 Head length	5	1.63–1.90	1.81	5	2.03–2.24	2.14
3 " width	5	1.52–1.69	1.60	5	1.67–1.91	1.79
Distance:						
4 inter-ocular	5	0.79–0.95	0.86	5	0.91–1.10	0.99
5 ante-ocular	5	0.70–0.77	0.74	5	0.85–0.96	0.90
Antennae:						
6 segm. I length	5	2.47–3.04	2.69	5	2.85–3.32	3.03
7 " II "	4	2.88–3.50	3.10	4	3.16–4.71	3.63
8 " III "	4	2.44–2.97	2.62	4	2.73–3.36	2.99
9 " IV "	3	2.49–3.55	3.14	1	3.26	3.26
Labium:						
10 segm. I length	5	1.48–1.74	1.65	5	1.80–2.09	1.99
11 " II "	5	1.36–1.90	1.64	5	1.71–2.09	1.99
12 " III "	5	0.79–1.04	0.93	5	1.04–1.29	1.16
13 " IV "	5	1.25–1.90	1.51	5	1.63–2.10	1.91
14 Pronotum length	5	2.01–2.73	2.42	5	2.64–3.45	3.05
15 " width	5	3.16–4.22	3.68	5	4.17–5.37	4.71
16 Scutellum length	4	1.29–1.65	1.53	5	1.78–2.18	1.94
17 " width	5	1.15–1.52	1.34	5	1.52–2.05	1.73
18 Hind tibia length	5	6.72–9.12	7.58	4	8.64–9.60	9.13
Tibial dilation:						
19 total width	5	1.87–3.64	2.60	4	3.20–4.20	3.69
external part:						
20 length	5	5.28–7.68	6.25	4	8.06–8.40	8.05
21 width	5	1.25–2.40	1.70	4	2.01–2.73	2.40
internal part:						
22 length	5	2.78–4.17	3.29	4	4.32–4.80	4.57
23 width	5	0.48–1.00	0.70	4	1.00–1.25	1.15
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.78–7.72:1	6.86:1	5	6.60–7.33:1	7.01:1
1 / 18	5	1.47–1.93:1	1.63:1	4	1.55–1.73:1	1.64:1
2 / 3	5	1.07–1.22:1	1.13:1	5	1.14–1.21:1	1.19:1
6 / 2	5	1.32–1.72:1	1.48:1	5	1.30–1.52:1	1.41:1
10 / 2	5	0.86–0.98:1	0.91:1	5	0.88–0.95:1	0.92:1
9 / 6	3	1.00–1.28:1	1.16:1	1	1.14:1	1.14:1
15 / 16	4	2.35–2.58:1	2.40:1	5	2.31–2.58:1	2.42:1
20 / 18 %	5	78.57–87.09	82.45	4	87.50–88.88	88.17
22 / 18 %	5	41.36–45.72	43.40	4	46.90–57.14	50.05

Chondrocera signoreti sp. n

(Plate 16)

General and differential diagnosis: Antenna yellow ochre, with brown markings, all antennal segments cylindrical, thin and long; pronotal calli slightly elevated; dorsum with blue-green metallic reflections and a narrow brown band at the level of coxae. Characteristic features of ♂♂: shape and size of genital capsule and parameres, presence of the sclerotized area on posterior surface of dorsal sac, presence of processes 13a-b, and the shape and size of process 5a. Those of ♀♀: the shape of Ist gonocoxa and the shape and size of spermatheca.

Description: Head. Basically yellow ochre; a pair of longitudinal patches between the eye, and a narrow band behind the eye light brown. Ist labial segment yellow ochre, the others light brown to brown, becoming darker distally. Ist antennal segment yellow ochre, with the outer surface brown; IInd and IIIrd segment yellow ochre, with distal half brown; IVth segment brownish. Tylus rather prominent, blunt, longer than and elevated above juga, forming an elevated ridge between the latter; juga bulging with curved median and lateral margins. All segments of antenna cylindrical, thin and long. Labium short not reaching beyond IIIrd sternite. Thorax: Area between and behind the humeral angles of pronotum, scutellum, and corium brown with metallic blue-green shine, which give an overall bluish gray colouration; most of pronotum and pleural and sternal areas yellow ochre, with the following parts

brown to dark brown: a pair of elongate oblique patches behind the calli, a band dorsal to the pleural calli, a narrow band extending from prothoracic precoxal bridge to the metathoracic supracoxal lobe, anterior process of peritreme and a small patch on upper anterior corner of mesopleura; the posterior margin of pronotum, margins and apex of scutellum, and the margins and veins of corium yellow ochre. Legs basically yellow ochre; in all the three pairs, the external surface of coxa with a brown band, anterior face of trochanter with a brown patch, and anterior face of femur with a brown narrow short band not reaching the apex. Anterior and posterior surfaces of tibial dilation with brown or brownish irregular patches and posterior surface with the main shaft of tibia and the margin of outer dilation reddish. Pronotal calli slightly elevated; humeral angles spinose. Hind legs longer than fore and middle legs, hind tibia (fig. I) with foliaceous external and internal dilations, the external one shorter than in C. laticornis, sinuous and bent posteriorly, forming a sort of median concavity. Abdomen: Tergites yellow ochre, posterior margin of tergites II to VI brownish, latero-posterior margin of VII tergite with a brownish patch; on posterior margin of each segment of connexivum a brown patch which becomes wider posteriorly. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia : Genital capsule (fig. A,B) - posterior margin slightly notched medially, situated below the level of lateral margins; the latter slightly descending posteriorly then raised behind the level of proctiger and descend toward the posterior margin. Paramere (fig. C,D) -

shaft slightly curved medially, without dorsal carina; outer lobe elongate, depressed and incurved; shank flat and wide, curved basally and almost straight distally, with blunt tip. Phallus (fig. E): phallotheca dorsally and laterally slightly sclerotized, with processes 14a-b membranous, rounded and prominent, projecting laterally; conjunctiva with moderately developed dorsal sac terminating in distal lobe, the former has two elongate additional sclerotizations on the proximal posterior surface, and another smaller one each below the process 16a-b; conjunctiva armed with the following processes: 16a-b heavily sclerotized, slender and pointed; 9a-b membranous, small and flat; 15a-b rudimentary; 8a-b narrow and sinuate, with acute tips; 5a (fig. E,F) with two distinct proximal convolutions and the third wide and distally complete.

Female genitalia: Ist gonocoxa and VIII laterotergite as shown in fig. G; spermatheca (fig. H) short with a wide median swollen portion, becoming tubular distally.

Measurements and Ratios: (see table 12)

Geographical distribution: (Map 4). This species seems to have a very wide distribution but appears to be rather uncommon and this explains the scarcity of material recorded; the existing material was collected in such widely separated areas as Mexico, St. Domingo and Brasil.

Note: Signoret apparently recognized this species as distinct from the others and labelled it "transversus" in his collection, but that was

never published therefore is considered as a manuscript name (nomen nudum) and I am naming this species signoreti.

Material examined

a) Type material: Holotype ♂ of Chondrocera signoreti, labelled "Mexico, Museum Paris" preserved in MNHN collection. Paratypes: ANTILLES: Guadalupe Is.: (Allotype), 1 ♀ (TM); sd., 1 ♀ (TM); Trois Rivieres, Dufeu, 1 ♂ (TM). Dominican Rep.: St. Domingo, 1 ♂ (BMNH). BRASIL: labelled "transversus det. Signoret", 1 ♀, . ♀ (NM). MEXICO: 1 ♂, 1♀ (MNHN).

Plate 16

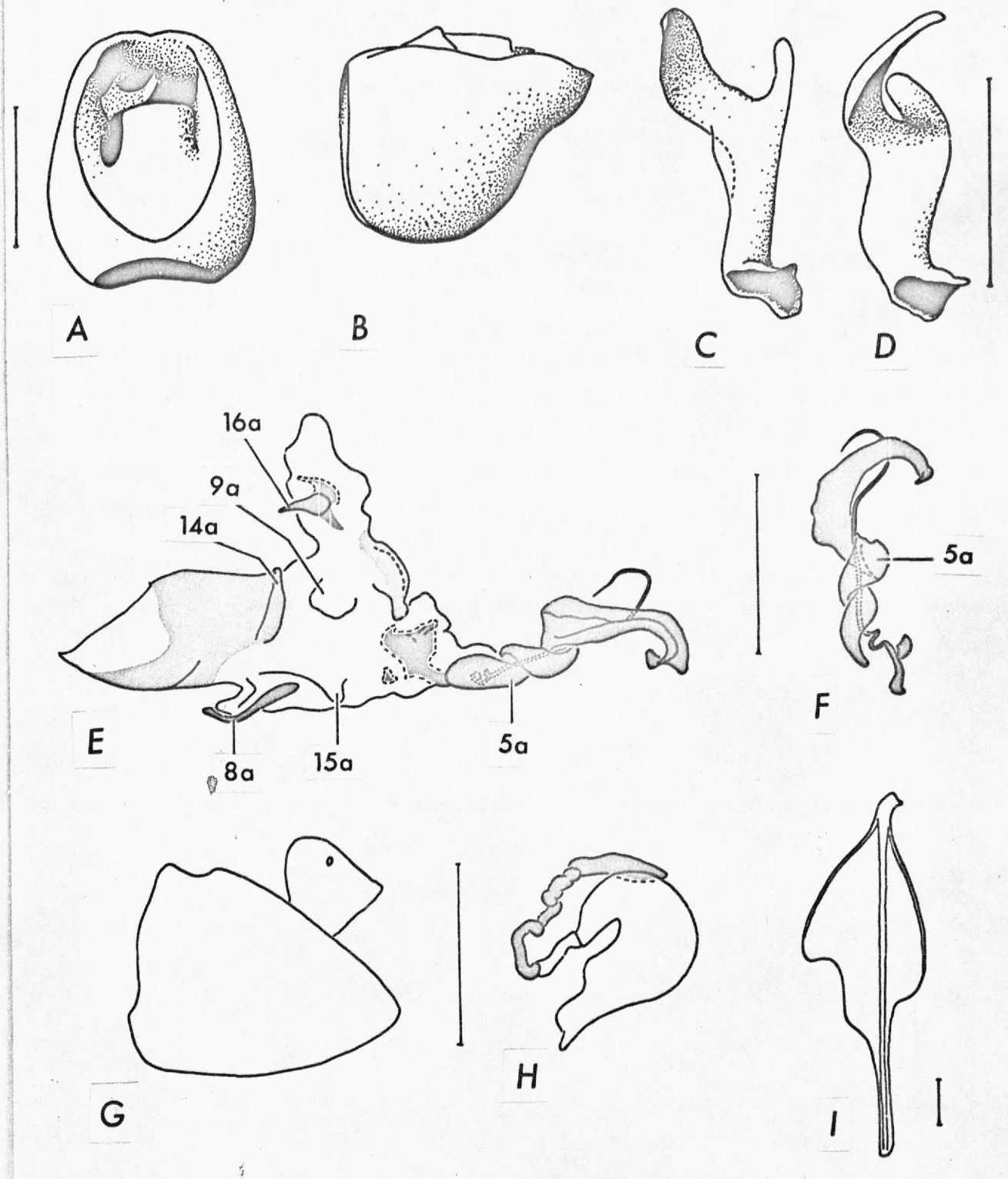


Table 12 Measurements (4 ♂♂ and 2 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	12.0-14.0	12.57	2	12.5-14.0	13.25
2 Head length	4	1.76-1.90	1.82	2	1.78-1.93	1.85
3 " width	4	1.65-1.78	1.70	2	1.63-1.82	1.72
Distance:						
4 inter-ocular	4	0.85-0.93	0.88	2	0.85-0.89	1.87
5 ante-ocular	4	0.68-0.72	0.70	2	0.76-0.83	0.79
Antennae:						
6 segm. I length	4	2.66-2.85	2.70	2	2.28-2.85	2.56
7 " II "	4	3.31-3.60	3.43	1	3.69	3.69
8 " III "	4	2.68-3.07	2.90	1	3.12	3.12
9 " IV "	1	2.88	2.88	-	--	--
Labium:						
10 segm. I length	4	1.57-1.74	1.64	2	1.63-1.80	1.71
11 " II "	4	1.52-1.71	1.62	2	1.61-1.65	1.63
12 " III "	4	0.79-0.89	0.84	2	0.85-1.00	0.92
13 " IV "	4	1.40-1.57	1.50	2	1.44-1.53	1.84
14 Pronotum length	4	2.35-2.54	2.42	2	2.16-2.73	2.44
15 " width	4	3.64-4.12	3.84	2	3.45-4.22	3.83
16 Scutellum length	4	1.61-1.67	1.64	1	1.44	1.44
17 " width	4	1.33-1.44	1.83	1	1.25	1.25
18 Hind tibia length	3	7.96-8.88	8.28	2	7.44-8.78	8.11
Tibial dilation:						
19 total width	3	2.45-2.64	2.54	1	---	2.73
external part:						
20 length	3	5.76-6.24	6.00	2	5.47-6.24	5.85
21 width	3	1.70-1.77	1.73	2	1.92-2.06	1.99
internal part:						
22 length	3	3.84-4.51	4.11	2	3.84-4.46	4.15
23 width	3	0.68-0.80	0.73	1	0.76	0.76
Ratios: (figures refer to character numbers above).						
1 / 2	4	6.52-7.36:1	6.90:1	2	7.02-7.25:1	7.16:1
1 / 18	3	1.50-1.57:1	1.15:1	2	1.59-1.68:1	1.63:1
2 / 3	4	1.05-1.09:1	1.07:1	2	1.06-1.09:1	1.07:1
6 / 2	4	1.44-1.51:1	1.48:1	2	1.28-1.47:1	1.38:1
10 / 2	4	0.87-0.91:1	0.90:1	2	0.91-0.93:1	0.92:1
9 / 6	1	8.06:1	1.06:1	-	---	--
15 / 16	4	2.17-2.49:1	2.34:1	1	2.65:1	2.65:1
20 / 18 %	3	70.27-74.91	72.46	2	71.07-73.52	72.13
22 / 18 %	3	48.24-50.78	49.63	2	50.79-51.6.	51.17

ANISOSCELIS Latreille gen. rev.

(Plates 17-19)

Anisoscelis latreille, 1829: 197. Type-species: Lygaeus foliaceous Fabircius, 1803, by PRESENT DESIGNATION.

Anisoscelis Latreille: Laporte, 1832: 31; Stål, 1862: 294; 1867: 544; 1868: 51; 1870: 158; Lethierry & Severin, 1894: 45; Blöte, 1936: 27.

Diagnosis: Medium sized species. Head. Basically yellow ochre, the dorsal surface usually darker, sometimes with brownish markings; all segments of antenna brownish to dark brown usually with yellowish markings. Wider than long, slightly declivent, slightly depressed behind the ocelli; tylus and juga below the level of antenniferous tubercles; juga swollen, slightly projecting below the latter; Ist antennal segment long but not twice as long as head; segments II to IV cylindrical, thin and long. Thorax. Basically yellow ochre, usually with pronotum and scutellum partially or totally metallic green, occasionally metallic blue; one species and one subspecies have the pronotum and scutellum pale brown to dark brown with some darker to blackish areas. Pronotum declivent and punctated; calli indistinctly separated from each other, with different sculpture than the disk; lateral margins straight, in some species carinate, slightly projecting antero laterally at the level of calli; humeral areas slightly elevated at, and markedly deflected towards the

horizontal humeral angles; postero-lateral margins sinuous and entire; posterior margin slightly depressed, straight or concave, without pronotal extensions; scutellum slender, punctate, or slightly rugose, usually flat, sometimes slightly depressed towards the apex; without distinct marginal ridges; hind legs considerably longer than fore and middle legs; apex of femora armed with one pair of spines; hind tibia (fig. I) with concave foliaceous external and internal dilation, i.e. each with raised margin; the external dilation extending almost over the whole length of tibia, sinuous and tapering towards the apex. Corium usually pale brown to brown with or without blackish markings, and as on pronotum and scutellum either entirely or partially or with only diffuse metallic green shine, moderately punctate; membrane dull brown. Abdomen. Dorsal region metallic green with intersegmental areas yellow ochre, sometimes with yellow ochre spots at the lateral margins of tergites.

Male genitalia: Genital capsule (fig. A,B) - with subproctigeral sac; posterior margin with median emargination, variable in size; lateral margin sinuous, sometimes projecting dorsally, with variable medially directed protuberance; ventral ridge curved or "U" shaped. Paramere (fig. C,D) - shaft slightly curved; shank simple, flat and slender, usually strongly curved latero-postero-dorsally, projecting very sharply from main shaft, usually with laterally skewed tip. Phallus (fig. E) - with phallotheca dorsally and laterally slightly sclerotized, the lateral sclerotization occasionally moderate and always extending over process 14a-b and part of conjunctiva behind it; processes 14a-b lateral and projected postero-laterally, posterior surface of dorsal sac with a pair

of slightly sclerotized area extending from its base to processes 16a-b; conjunctiva armed with the following processes: 16a-b heavily sclerotized and spinose; 8a-b horizontal, slender or moderately long, wide and sinuous; 9a-b conspicuous, membranous with flat tip; 5a (fig. E,F) slender, sometimes styliform, with Ist convolution sinuous and the third either entirely sclerotized or with the whole, or only distal part of one of its margins membranous. Processes 15a-b absent.

Female genitalia: Spermatheca (fig. H) with wide and bulging base, tapering towards the apex, usually strongly curved near the apex of the duct; without duct dilation; spermathecal bulb elongate.

Sculpture: Pleural region with both shiny and dull areas; the shiny areas are distributed as follows: On propleural area - supracoxal lobes and postepimeral flange I. On mesopleura - episternal supracoxal lobe and postepimeral flange II. On metapleura - supracoxal lobe and postepimeral flange III.

Pubescence: Body comparatively bare, with thin hairs present only on calli and on disk of pronotum, and some very thin short hairs on sternite, becoming more dense and longer on genital segments.

Geographical distribution: Only known from Neotropical Region, collected over most of South America, except the central and south part of Argentina and Chile; also recorded from Cuba.

Discussion: The type of the genus Anisoscelis was never designated. In the course of this study, Lygaeus foliaceous Fabricius, 1803, Syst.

Rhyn. p.210.28, now Anisoscelis foliacea was designated as the type species, chosen by way of elimination because of the seven originally included species this is the only species now retained in the genus. The genus Anisoscelis is restricted to include four species, out of the ten species listed by Lethierry & Severin, 1894, of which one is reduced to subspecific rank; of the remaining six species, one is a synonym of another species, one belongs to a different tribe (Acanthocephalini) and four are transferred to the new genus Bitta.

KEY TO SPECIES

1 Pronotum, scutellum and corium pale brown, lateral margins black, the latter not carinate; posterior margin of genital capsule with "V" shaped notch and the lateral margin strongly elevated, with small inner protuberance; paramere with small outer lobe, without dorso-distal elevation; spermatheca with a dorsally directed strong curvature at considerable distance from apex of duct..... versicolor (p.169)

- Pronotum and scutellum totally or partially metallic green; corium totally or partially metallic green, or pale brown to brown with or without dark to blackish areas; lateral margins yellow ochre and carinate; posterior and lateral margins of genital capsule with different combination of characters than above; paramere with large outer lobe and with dorso-distal elevation; spermatheca with different combination

of characters than above..... 2

2 (1) Pronotum with a metallic green patch on posterior margin, which usually extends anteriorly up to the middle of the disk; scutellum metallic green; corium pale brown; posterior margin of genital capsule with a wide median "V" shaped notch; lateral margins of genital capsule gradually raised posteriorly, with small vertical inner protuberance; paramere with outer lobe rounded and indistinctly differentiated from main shaft; spermatheca with ventrally directed strong curvature near the apex of duct.....scutellaris (p.175)

- Pronotum, scutellum and corium either entirely metallic green (foliacea foliacea) or partially pale brown to brown with some metallic green and blackish areas, sometimes the metallic green diffuse (foliacea marginella); posterior margin of genital capsule slightly notched; lateral margins of genital capsule slightly elevated, with small acute inner protuberance; paramere with subtriangular outer lobe, distinctly differentiated at outer side by a depression; spermatheca comparatively long without strong curvatures.....foliacea (p.153)

Anisoscelis foliacea (Fabricius) 1803

(Plate 17)

Lygaeus foliaceous Fabricius, 1803: 210.28 LECTOTYPE ♂ Brasil

(UZM), here designated, locality here restricted [examined, dissected].

Coreus foliaceous (Fabricius) Saint Fargeau & Serville, 1825: 60.5 (varaety)

Diactor foliaceous (Fabricius) Dallas, 1852: 451.2

Anisoscelis foliacea (Fabricius): Stål, 1868: 51.1; 1870: 158.1; Lethierry & Severin, 1894: 45; Blöte 1936: 27; Stoll Pun. pl. 28, fig. 201.

General and differential diagnosis: Antenna dark brown, with both proxinal and distal extremities of IInd and IIIrd segments yellowish white; pronotum, scutellum, and corium metallic green; legs with longitudinal black bands. Characteristic features of ♂♂: shape and size of genital capsule and parameres, and the shape and size of processes 8a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa, and the shape and size of spermatheca.

Description: Head. Basically yellow ochre with the whole dorsal surface darker or brownish. Labial segments yellow ochre, with the tip of the IVth, black. All antennal segments basically dark brown; Ist segment usually with base and anterior surface yellowish white, sometimes the internal and posterior surfaces also yellowish white; IInd and IIIrd segments with the extremities yellowish white. Tylus curved, not projecting anteriorly, level or slightly above juga; the latter swollen, slightly expanded below the antenniferous tubercles and curved median margin. Labium reaching the IVth sternite. Thorax. Pronotum, scutellum and

corium with metallic colouration; pleural and sternal areas yellow ochre. All legs basically yellowish white to yellow ochre. Fore and middle legs usually with three equidistant narrow longitudinal black bands, extending over trochanter and femur, and with two similar black bands on tibia. Hind leg - femur with 1 to 3 black longitudinal bands, not reaching its apex; posterior surface of tibial dilation yellow ochre to yellow orange, the widest middle part tinged here and there with chestnut brown, reddish brown and black; the base, approximately the distal $\frac{1}{3}$ of tibia and a subrectangular patch on internal dilation yellow ochre to yellow orange; anterior surface of the dilation with a similar pattern of colour but less intense than on posterior surface. Pronotal calli slightly elevated, lateral margins each with elevated carina, expanded antero laterally at the level of calli; collar usually with a conspicuous slender tubercle at the level of lateral margins; the surface of the tubercle sometimes with small secondary tubercles; humeral angles subacute to acute, horizontal or raised, usually slightly curved posteriorly; posterior margin of pronotum straight or slightly concave. Abdomen. Tergites metallic green with the intersegmental sutures yellow ochre; connexivum yellow ochre with a black longitudinal band extending from IInd to VIIth segment, becoming wider posteriorly. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - posterior margin medially slightly emarginated more or less level with the lateral margins; the latter sinuous with a rounded elevation behind the level of proctiger, bearing a small and acute mediad protuberance (a); ventral ridge curved.

Paramere (fig. C,D) - shaft slightly curved medially, dorso-distally elevated (b), without dorsal carina; outer lobe wide and conspicuous, on the outer side distinctly delimited by a shallow notch; shank flat and wide, curved at base, with blunt tip. Phallus (fig. E) - phallotheca with processes 14a-b in lateral position, slightly sclerotized, triangular and directed antero laterally; conjunctiva with large bulging dorsal sac, terminating in a rounded distal lobe; the posterior surface of the sac slightly sclerotized from the level of processes 16a-b down to its somewhat more sclerotized base. Conjunctiva armed with the following processes: 16a-b heavily sclerotized, spinose, slender and curved, with wide base; 9a-b conspicuous, membranous with flat tip; 8a-b wide each with curved external margin and thick tip; 5a (fig. E,F) with Ist convolution sinuate ventrally, IIIrd convolution wide. Processes 15a-b absent.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) short, and enlarged at base.

Geographical distribution: (Map 5) Distributed over South America and the Antilles. In South America its range extends from Venezuela to the northern part of Argentina and from the lower plains of Peru to Brasil.

Habitat and Biology: During the dissections, fully developed eggs were found in two females, one from Venezuela collected in May, but the date of collection of the other was not recorded; the eggs are cupuliform, length 1.80mm, width 1.14mm, height 1.19mm. The host plant of the

available specimens was not recorded, except for two specimens from Surinam, Paramaribo, collected by J. Van d. Vecht on Passiflora sp; these specimens belong to A. foliacea foliacea one of the two here recognized subspecies.

Discussion: Fabricius and Dallas based the description of their species Lygaeous foliaceous and Leptoscelis marginella respectively mainly on colouration. Detailed examination of external morphology and genitalia of a large series of material of both species from different localities, showed no sufficiently significant differences to consider them as distinct species; on the contrary the following indicate that both forms are conspecific (1) the differences between these two forms are minor when compared with the differences used for separation of other species of the genus; (2) the range of individual variation of some characters of both forms are overlapping and very similar; (3) the differences in colouration of these two forms are not correlated with the observed differences in morphological characters but are associated with the actual geographical location; (4) the distribution of both forms clearly follow an allopatric pattern as defined by (Mayr, 1963: 349; 1969: 41); foliacea occupies the northern and central part of the range of the species, i.e. the equatorial part of South America corresponding generally with tropical rain forest zone, to the north of which (as far as the available records indicate) it is absent, but reappears in the southern part of Cuba; marginella has two separate areas of distribution, one in the most northern part of South America, and the other in the southern and south-eastern part of the distribution range of the species;

(5) intermediate forms have been collected in what may be regarded as contact areas of distribution of these two forms, namely in Bolivia, Paraguay and northern part of Argentina; no intermediate forms were available from any part of Brasil, nor from the area of contact between the two forms in the northern part of the range. The loss of metallic green colouration in the intermediate forms, from the foliacea to marginella patterns is gradual but not uniform, i.e. the different parts (pronotum, scutellum and corium) may be affected to different degrees in any one individual; this makes it sometimes rather difficult to decide to which of the two forms the particular specimen should be referred, but most of these have been assigned to marginella for the reason of having a brown longitudinal band on dorsal part of the head. The intermediate forms can be characterized as follows: overall brown colour with variable metallic green colouration concentrated mainly behind humeral area and posterior margin of pronotum, and usually with some minute metallic spots, scattered over the central part of pronotum and over scutellum and corium.

All these observations lead to the conclusion that Leptoscelis marginella Dallas represents only a subspecies of A. foliacea. However A. f. marginella appears to include three different forms: (1) the typical marginella (33 specimens) from the south-eastern Brasil; (2) a variant (4 specimens) described from Venezuela, Colombia and Trinidad, differing comparatively little from typical (see discussion of variants 1a and b; (3) more distinct variant (3 specimens) described from Argentina (see description of variant 2). At present all are considered as forms of

A. foliacea marginella, but it is possible that the study of further material may prove that each deserves a separate subspecific rank.

Anisoscelis foliacea foliacea (Fabricius) 1803

Differential diagnosis: Dorsal surface of head without markings; IInd and IIIrd segments of antenna with the white patch on the extremities, comparatively shorter; calli, lateral margins of pronotum and costal margin of corium yellow ochre; the rest of pronotum, scutellum and corium metallic green, sometimes greenish blue, with the margins of the pronotum, scutellum and the costal margin of corium yellow ochre.

Measurements and Ratios: (see table 13)

Geographical distribution: (Map 5) This subspecies has been collected in: Northern Brasil, Surinam, French Guiana, Guiana, Venezuela, Peru, Bolivia and Cuba.

Discussion: The most important variation observed in the examined material were as follows: the paraletotype apparently is a melanic form of this subspecies and shows an abnormal darkening of different parts of the body, namely: dorsal surface of head black, lateral and ventral surfaces dark brown to black, Ist antennal segment entirely black, IInd and IIIrd with its extremities brown; collar, calli and lateral margins of pronotum black; the rest of pronotum, scutellum and corium metallic blue; pleurae brown to black, becoming darker towards the dorsum; hind tibia black, tergites dark green; sternites, first gonocoxa and laterotergite brown.

Other variations were: a female from Bolivia shows no metallic green colouration on the central and posterior margin of corium, scutellum and central part of pronotum; these conditions are somewhat intermediate between A. foliacea foliacea and A. foliacea marginella.

Material examined.

a) Type material: Lygaeus foliaceous Fabricius, 2 ♀♀ syntypes: one labelled "Lygaeus foliaceous Fabr., ♀, Am. merid. Schmidl, Mus. de Sehestedt, type" in UZM (Copenhagen Collection), was designated and labelled as lectotype, the other one labelled simply "foliaceous", believed to belong to the "type series" (Zimsen, E, 1964) was designated as paralectotype. The type locality originally quoted as "America meridionatis" is here restricted to Brasil, Amazonas, where specimens of only the nominate subspecies are found.

b) Other material: ANTILLES: Cuba: Guantánamo, - V - 1924, E. le Moult, 1 ♂, 4 ♀ (RNH); s.d., 1 ♀ (IZA). BOLIVIA: Santa Cruz, Steinbach, 1 ♀ (ZI); 1 ♂ (BMNH). BRASIL: Amazonas, boca do Te fe, 1906, P. Trochon, 1 ♀ (MNHN), Calkoen, 1 ♀ (RNH); Pará, Rio Trombetas, E. le Moult, 1 ♀ (RNH); Amazonas, Stevens, 1 ♂ (NR); s.l., 1 ♀ (NR); Amazonas, Manaos, Roman, 3 ♂, 4 ♀ (NR); Amazonas sup., Olivenca, 2 ♂, 1 ♀ (NR); Amazonas inf., 1 ♂ (NR); Nedse, R. Negro, 13 - XI - 1923, Melin, 1 ♂ (ZIU); Pará 1931, G. Molnar, 1 ♀ (TM); Sao Paulo, 1 ♀ (TM); Signoret, 1 ♀, (NMW); Amazon, Taperinha, Santarem, - III - 1916, G. Hagmann, 2 ♀ (NM); Obidos, Amazonas, H. Rolle, 1 ♂, 2♀ (MNHU); 1 ♂ (MNHN); Sao Paulo, 1 ♂ (BMNH); 1 ♀ (BMNH); Sao Paulo, 11 - XII - 1874, R. Sotinoes, 1 ♀ (BMNH); Pará,

Amazonas, 1869, Janson, 1 ♂ (IRSNB); Obidos, Amazonas, H. Rolle, 1 ♀ (MNHU). FRENCH GUIANA: Cayene, 1 ♂ (TM); 1899, R. Oberthur, 1 ♀ (MNHN); 1 ♀ (MNHN); Cayene, 1 ♂, 1 ♀ (MNHN); Cayene, Maroni, 1 ♀ (MNHN); s.l., 1 ♀ (RNH); Nouveau Chantier, Le Moult, 12 ♂, 1 ♀ (RNH); St. Laurent du Maroni, - XI - 1907, s.c., 20 ♂, 22 ♀ (RNH); s.d., 2 ♂, 2 ♀ (IZA); Cayene, E. Révelliere, 2 ♂, 1 ♀ (MNHN); Cayene, Pillault, 1 ♀ (IRSNB). GUYANA: Demerara, Signoret, 1 ♂ (NM). PERU: Ob. Madre de Dios, 500 mts. Garlepp, 2 ♀ (MNHU); Yarimaguas, 1886, Sallé, 2 ♂ (MNHN); 1 ♂ (MNHN); Puerto Inca, Rio Pachitea, 1 ♂ (RNH); Iquitos, S. Rogue, E. le Moult, 7 ♂, 4 ♀ (RNH); Iquitos, R. Itaya, 14 - I 0 1925, Melin, 2 ♂, 1 ♀ (ZIU); s.l., 26 - XI - 1929, Klug, 1 ♂ (ZI); Marcopaco, 1 ♀ (TM); Amazonas sup. Iquitos, 1 ♂ (NR). SURINAM: Schiener, 1 ♂ (NM); Paramaribo, Heller (MNHU); s.l., 23 - IV - 1963, J. Van der Vecht, on Passiflora, 2 ♂ (RNH); Van Brussel, 7 ♂, 6 ♀, 2 ninph, (RNH); Paramaribo, Koning, 1 ♀ (RNH); Kol. Espos. 1883, 1 ♀ (RNH); Paramaribo, - IV - 1958, P.H. v. Doesburg, 2 ♂, 2 ♀ (RNH); s.d., 1 ♂ (IZA); s.l., 20 - IV - 1963, s.c., 3 ♂ (RNH); Sipaliwini, 8 - VI - 1963, s.c., 1 ♀ (RNH); Paramaribo, Fernandez Rd., 28 - VII - 1963, 1 ♂ (RNH); Kayser air ships, 1 - VII - 1963, Pypenn, 2 ♂ (RNH); Galibi, 29 - II - 1959, P.H. v. Doesburg, 2 ♂, 2 ♀ (RNH); Paramaribo, 17 - I - 1946, D.C. Goyskes, on Markorea, 1 ♀ (RNH); 1 ♀, (IRSNB). VENEZUELA: Terr. Fed. Amazonas, Yavita, Rio Atabapo, 2 - V - 1953, J.A. Guzman, 1 ♂, 1 ♀ (IZA).

c) Material without data: 1 ♀ (MNHN); 1 ♂, labelled "Oshanin det." (ZI); 1 ♀, labelled "1867, Depuiset (NMW); 1 ♀ (MNHU) 1 ♀, labelled "Cat. No. 3" (RNH).

Anisoscelis Foliacea marginella (Dallas), 1852 statt.n.

Coreus foliaceus (Fabricius) Saint Fargeau & Serville, 1825: 60.5 [excl. var. which = Anisoscelis foliacea (Fabricius), 1803]

Leptoscelis marginella Dallas, 1852: 457.8 LECTOTYPE ♂ and 1 ♀ paralectotype Brasil (BMNH), here designated [examined, dissected]

Diactor marginellus (Dallas) Walker, 1871: 123

Diactor cincticollis Stål, 1855: 185.1 Holotype ♂, Brasil (originally "Patria ignota") (NR), type rev. [examined, dissected]

Anisoscelis marginella (Dallas): Stål, 1870: 159.2; Lethierry & Severin, 1894: 45; Blöte, 1936: 27.

Differential diagnosis: Dorsal surface of head with a brown longitudinal band between the eye, the latter becoming darker posteriorly; IIIrd antennal segment carinated at the distal ⅔ of anterior surface, the carina widening distally; lateral margins yellow ochre; calli dark brown; submarginal lateral areas usually dark brown, the latter becoming black posteriorly; posterior margin dark brown to black with or without scattered metallic green microscopic spots; central area of pronotum reddish brown to pale brown sometimes with few green metallic spots, scutellum pale brown to brown, with yellow ochre margins, sometimes with few metallic green microscopic spots; corium pale brown to dark brown, with costal margin yellow ochre, embolium brown to dark brown, and usually the anal margin of clavus brown to dark brown.

Measurements and Ratios: (see table 14)

Geographical distribution: (Map 5) This subspecies generally has a more southerly distribution than A. Foliacea foliacea, occurring in the eastern and southern part of Brasil, Paraguay and northern part of Argentina; but a few specimens have been collected in Colombia, Venezuela and Trinidad.

Discussion: The most important variations observed in the examined material were as follows: 1a) the female from Colombia and the male and the female from Trinidad showed an overall brownish colouration with diffused metallic green on pronotum, scutellum and corium. 1b) The somewhat similar four specimens from Venezuela showed an overall brown colouration, with posterior half of the central part of pronotum metallic green, scutellum comparatively darker than anterior part of pronotum, corium with very few metallic green minute spots on costal margin which was comparatively darker than the rest of corium. 2) The three specimens from Argentina showed an overall brownish colouration on pronotum, scutellum and corium, without metallic green colouration.

Material examined.

a) Type material: Leptoscelis marginella Dallas, 2 syntypes in the BMNH collection: the ♂ labelled "4 Diactor marginellus, type, 419a" from Brasil, presented by C. Stewart, was designated and labelled lectotype; the ♀, labelled "Diactor marginellus, Walker's catal., No. 273.47", was designated paralectotype.

Diactor cincticollis Stål, 1855, from Stål's collection in NR, consisting of 2 specimens: 1 ♀ labelled "Brasil, Stäl, Typus, Diactor

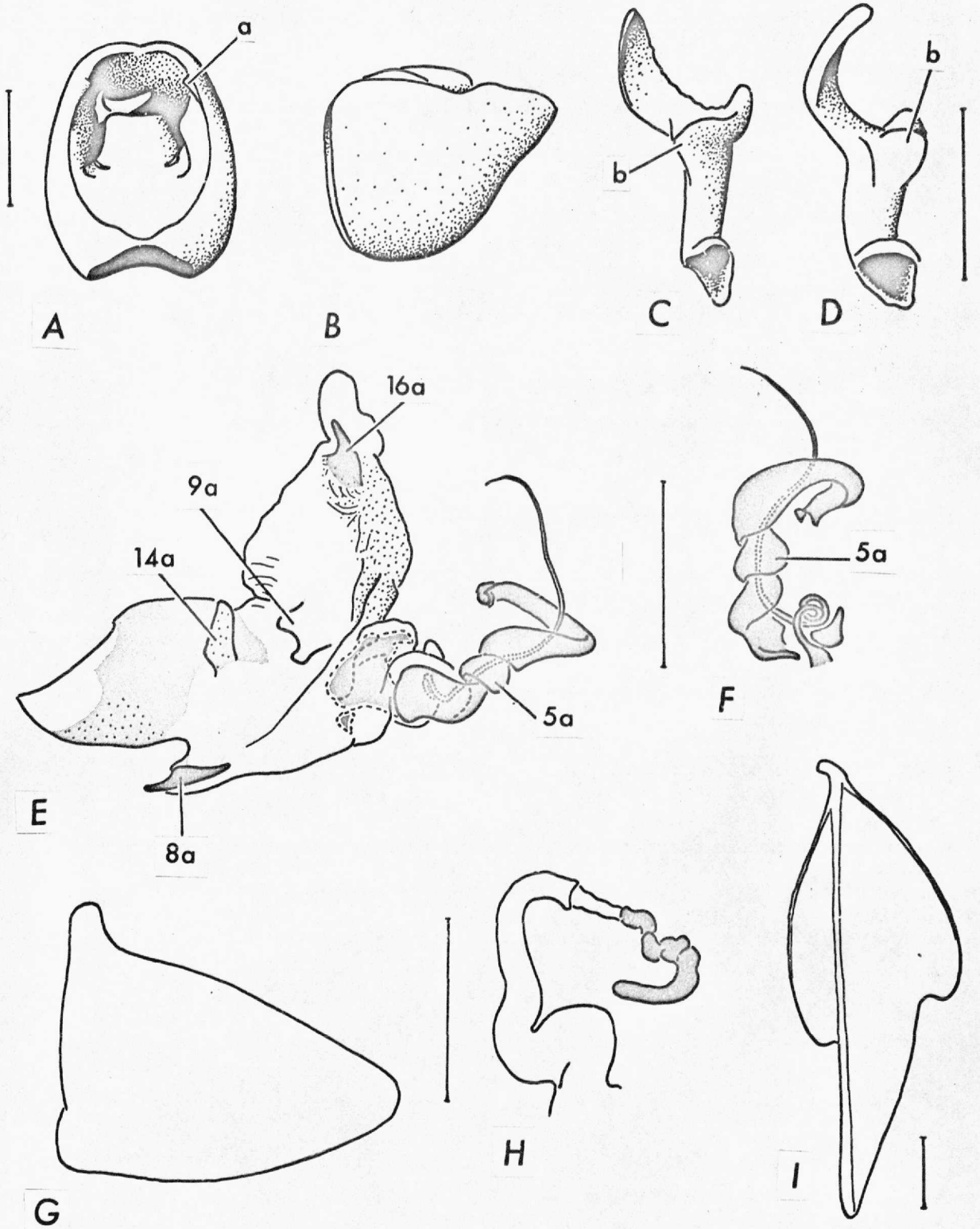
cincticollis (Typ.) Stål det, Bruck", and 1 ♂ without locality of origin, labelled "Paratypus". The labels ("Typus" and "paratypus") are red and rectangular, and apparently were attached to the two specimens at the same time by Bruck, but this designation of the type of cincticollis is erroneous. The first reference of Stål to D. cincticollis was in 1855 when he described the species, stating that its origin is not known (Patria ignota); in 1870 he simply synonymized this species with Anisoscelis marginella (Dallas) and gave Brasil as locality; it is clear therefore that the original description was based on the male specimen of unknown locality, and this male represents the true holotype. The female specimen marked as belonging to Stäl's collection apparently was obtained by him later and may not belong to the type series at all. I have marked the male specimen with a circular Holotype label, i.e. as the holotype of D. cincticollis Stál, and to avoid confusion turned face down both "Paratypus" and "Typus" rectangular labels.

b) Other material: ANTILLAS: Trinidad: Mont Tucuche, 1000m, 1914, P. Serre, 1 ♀ (MNHN); - X - 1929.-I - 1930, R.A. Lever, 1 ♂ (BMNH). ARGENTINA: Prov. Sta Fé, 1915, O.W. Thomas, 1 ♂ (BMNH); Clorinda, - IX - 1940, 2 ♀ (MLP); s.d., 1 ♀ (IZA); San Ignacio Misiones Prov. Buenos Aires, Chacabuco, - II - 1940, J. Boso, 1 ♂ (MLP); 1 - V - 1939, Benitez, 1 ♂ (MLP)?; La Pampa Pico, - V - 1940, 1 ♂ (MLP); s.d., 1 ♂ (IZA); s.l., - IV - 1941, 1 ♀ (MLP). BRASIL: 3 ♀ (NM); Schott, 2 ♀ (NM); Rio de Janeiro, "Novara Exp.", 1 ♂, 1 ♀ (NM); Rio Grande do Sul, Stieglmayr, 1 ♀ (NM); Rio Gr. do Sul, Cruz Alta, 1 ♀ (RNH); Rio de Janeiro, 1 ♀ (MNHU);

de Lacerda, 1 ♂ (IRSNB); Sao Paulo, 1 ♂ (TM); 1 ♂ (TM); Rio de Janeiro, 1 ♀ (UZM); 4 ♀ (UZM); Bahia, Lacerda, 1 ♂, 4 ♀ (IRSNB); s.c., 1 ♂ (IRSNB); Bahia, 1 ♀, (MNHU); 1 ♂ (ZSBS); 1 ♂ (IZA). COLOMBIA: 1 ♀ (NM). PARAGUAY: San Bernardino, Fiebrig, 1 ♀ (NM); s.l., s.c., 1 ♂, 1 ♀ (MNHU); s.d., 1 ♀ (IZA); Asunción, 1904, Anisits, 2 ♂ (TM); 1 ♀ (MLP); El Gran Chaco (nr. Concepción), A. Pride, 1 ♂ (BMNH). VENEZUELA: Sarare, F. Geay, 1 ♀ (MNHN); Caracas, Drewsen, 1 ♂, 1 ♀ (UZM); s.d., 1 ♂ (IZA); Monagas, Caripito, 0.100m, 19 - IX - 1965, F. Fernandez Yepez, C.J. Rosales, 1 ♀ (IZA); Miranda, Caucagua, 5 - XI - 1949, F. Fernández-Yepez, 1 ♀ (IZA).

c) Material without data: 1 ♀ (MLP); 1 ♂ (MNHN); 1 ♀ (UZM); 1 ♂, 1 ♀ Coll. Eversmann (ZI); 1 ♂ Oshanin det. (ZI); 1 ♀ (IRSNB); 1 ♂, 1 ♀ (IZA); 1 ♀ (NR).

Plate 17



A B C D E F G H I

Table 13 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.0–15.0	14.45	5	15.5–18.3	16.7
2 Head length	5	1.80–2.09	1.99	5	1.90–2.28	2.16
3 " width	5	2.03–2.26	2.17	5	2.29–2.37	2.33
Distance:						
4 inter-ocular	5	1.04–1.17	1.11	5	1.14–1.27	1.20
5 ante-ocular	5	0.64–0.74	0.67	5	0.68–0.81	0.75
Antennae:						
6 segm. I length	5	3.61–4.46	3.90	5	3.26–4.03	3.58
7 " II "	5	4.08–4.94	4.31	5	4.22–4.65	4.49
8 " III "	5	3.36–4.17	3.73	5	3.50–4.12	3.75
9 " IV "	3	3.64–4.12	3.94	2	3.84–4.32	4.08
Labium:						
10 segm. I length	5	1.93–2.24	2.07	5	2.28–2.47	2.38
11 " II "	5	1.90–2.31	2.09	5	1.99–2.31	2.19
12 " III "	5	1.14–1.42	1.24	5	1.33–1.52	1.41
13 " IV "	5	1.90–3.04	2.28	5	2.18–2.94	2.50
14 Pronotum length	5	2.28–2.97	2.70	5	2.78–3.45	3.06
15 " width	5	3.60–4.03	3.74	5	3.79–4.70	4.28
16 Scutellum length	5	1.93–2.35	2.07	5	2.16–2.45	2.30
17 " width	4	1.44–1.78	1.57	5	1.57–1.90	1.75
18 Hind tibia length	5	10.4–11.9	11.1	5	10.4–13.7	12.3
Tibial dilation						
19 total width	5	3.12–4.08	3.50	5	3.64–4.80	4.16
external part:						
20 length	5	9.88–11.3	10.57	5	9.84–12.9	11.57
21 width	5	2.06–2.92	2.46	5	2.40–3.36	2.83
internal part:						
22 length	5	5.28–6.24	5.74	5	5.23–7.34	6.47
23 width	5	0.96–1.05	0.99	5	1.00–1.44	1.22
Ratios: (figures refer to character numbers above).						
1 / 2	4	6.88–7.77:1	7.26:1	5	7.23–8.15:1	7.73:1
1 / 18	4	1.24–1.32:1	1.29:1	5	1.27–1.48:1	1.35:1
2 / 3	5	0.84–0.96:1	0.91:1	5	0.82–0.97:1	0.92:1
6 / 2	5	1.65–2.34:1	1.95:1	5	1.53–1.76:1	1.65:1
10 / 2	5	1.00–1.07:1	1.04:1	5	1.03–1.20:1	1.10:1
9 / 6	3	0.91–1.14:1	1.01:1	2	1.17–1.23:1	1.13:1
15 / 16	5	1.69–1.91:1	1.80:1	5	1.73–1.98:1	1.86:1
20 / 18 %	5	94.03–95.54	94.71	5	92.77–94.65	94.06
22 / 18 %	5	49.54–53.42	51.43	5	50.24–55.81	52.60

Table 14 Measurements (5♂♂ and 5 ♀♀ from 6 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	13.5-15.0	14.5	5	15.7-16.5	16.1
2 Head length	5	1.80-2.09	1.96	5	1.90-2.26	1.99
3 " width	5	1.93-2.18	2.06	5	2.09-2.28	2.14
Distance:						
4 inter-ocular	5	0.98-1.14	1.05	5	1.10-1.19	1.14
5 ante-ocular	5	0.66-0.76	0.70	5	0.76-0.79	0.78
Antennae:						
6 segm. I length	5	2.94-3.61	3.40	5	3.42-3.51	3.46
7 " II "	5	3.69-4.60	4.21	5	4.17-4.65	4.28
8 " III "	5	3.12-3.84	3.59	5	3.40-4.22	3.72
9 " IV "	2	3.36-3.88	3.62	4	3.13-3.93	3.75
Labium:						
10 segm. I length	5	1.90-2.09	1.98	5	2.16-2.28	2.18
11 " II "	4	1.71-2.03	1.89	4	1.90-2.28	2.10
12 " III "	4	1.04-1.25	1.16	4	1.23-1.38	1.29
13 " IV "	5	1.95-2.26	2.07	5	2.03-2.39	2.21
14 Pronotum length	5	2.40-2.97	2.74	5	2.98-3.16	3.01
15 " width	5	3.21-4.08	3.67	5	4.17-4.32	4.22
16 Scutellum length	3	1.71-2.01	1.88	4	2.16-2.29	2.23
17 " width	3	1.33-1.67	1.50	4	1.67-1.86	1.77
18 Hind tibia length	4	9.60-11.4	10.69	5	10.9-12.1	11.6
Tibial dilation:						
19 total width	4	2.64-3.84	3.32	5	2.88-4.32	3.79
external part:						
20 length	4	8.64-10.5	9.84	5	10.1-11.2	10.9
21 width	4	1.58-2.64	2.19	5	1.72-2.68	2.46
internal part:						
22 length	4	4.80-5.90	5.55	5	5.76-6.52	6.09
23 width	4	0.84-1.05	0.95	5	0.84-1.20	1.05
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.98-7.78:1	7.43:1	5	7.21-8.68:1	8.09:1
1 / 18	4	1.29-1.40:1	1.36:1	5	1.35-1.43:1	1.37:1
2 / 3	5	0.90-1.01:1	0.95:1	5	0.89-0.99:1	0.92:1
6 / 2	5	1.63-1.81:1	1.73:1	5	1.51-1.84:1	1.73:1
10 / 2	5	0.92-1.05:1	1.01:1	5	1.00-1.14:1	1.09:1
9 / 6	2	1.07-1.14:1	1.10:1	4	0.90-1.25:1	1.08:1
15 / 16	3	1.87-1.93:1	1.95:1	4	1.86-1.95:1	1.89:1
20 / 18 %	4	90.0-93.61	90.17	5	91.1-95.8	93.3
22 / 18 %	4	50.0-55.06	51.91	5	50.6-53.7	53.0

Anisoscelis discolor (Stål) 1854 comb.n

(Plate 18)

Diactor discolor Stål, 1854: 235.1 Holotype ♀ Ecuador (new type locality) (NR), original type locality "Tahiti" is here invalidated [examined, dissected].

Diactor discolor Stål: Stål, 1859: 233.33; 1870: 159.4; Lethierry & Severin, 1894: 45.

General and differential diagnosis: Antenna brown, with both proximal and distal extremities of IInd and IIIrd segment yellowish white; pronotum, scutellum and corium pale brown; lateral margins black and not carinated. Characteristic features of ♂♂: shape and size of genital capsule and paramere, and the shape and size of processes 8a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa, and the shape and size of spermatheca.

Description: Head. Basically yellow ochre, with dorsal surface pale brown. Ist labial segment yellow ochre; the rest gradually becoming brown distally, apex of IVth segment black. All segments of antenna basically brown to dark brown; Ist segment with anterior and internal surfaces yellow ochre; IInd and IIIrd segments with the extremities yellowish white. Tylus curved, not prominent, level or slightly above juga, the latter swollen, slightly expanded below the antenniferous

tubercles, not projecting anteriorly with curved medial margin. Labium reaching the posterior margin of IIIrd sternite. Thorax. Pronotum, scutellum and corium pale brown; lateral margins and humeral angles of pronotum, black; margins of scutellum and costal margin of corium as well as pleural and sternal areas yellow ochre. All legs yellow ochre to cinnamon, becoming slightly darker distally; posterior surface of tibial dilation basically yellow orange, the median widest part reddish brown with some irregular yellow orange patches; colouration of the anterior surface similar to the posterior but less intense. Pronotal calli slightly elevated; lateral margins not carinated; collar not tuberculated; humeral angles acute, horizontal or raised, usually slightly deflected posteriorly; posterior margin of pronotum concave. Abdomen. Tergites with irregular brownish patches near to the connexivum, with the intersegmental suture yellow ochre; connexivum yellow ochre with an oblique dark brown to black line, extending from IInd to VIIth segment. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - posterior margin sinuous with small "V" shaped median emargination, and below the level of lateral margins; the latter depressed at the level of proctiger, then strongly raised posteriorly, forming a dorsal prominence, which carries an inner small protuberance (a); ventral ridge "U" shaped. Paramere (fig. C,D) - shaft almost straight, without dorsal carina; outer lobe small and triangular; shank slender, curved, distally, flattened, ending in an acute skewed tip. Phallus (fig. E) - phallotheca with processes 14a-b in

lateral position, slightly sclerotized, rounded and directed antero laterally; conjunctiva with bulged dorsal sac, terminating in a postero-distal lobe; the base of the sac has an anterior fold which extends up to the processes 9a-b, and its posterior surface from the level of the processes 16a-b to the base very slightly sclerotized. Conjunctiva armed with the following processes: 16a-b heavily sclerotized, with wide base, long and curved, acutely pointed; 9a-b large membranous with flat tip; 8a-b narrow, long with blunt tips; 5a (fig. E,F) with Ist convolution strongly sinuate, IIIrd convolution slender, incomplete, and only partially sclerotized. Processes 15a-b absent.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) short, swollen at base, with a close dorsally deflected curvature at the median part of the duct.

Measurements and Ratios: (see table 15)

Geographical distribution: (Map 5) Only known from Ecuador, Guayaquil. Stål, 1854, describing A. discolor, followed the data on the label of the material available to him and recorded "Taiti" as the locality of its origin. Later, 1859, more precisely "Insula Taiti, maris pacifici", but in 1870, rather doubtfully "Taiti?". There is little doubt that the records of this locality is erroneous, probably due to erroneous labelling of his specimen. This suggestion is supported by the following: 1) Stål's specimen was collected during the voyage of Eugenie 1851-1853, and during this expedition collection of insects were made in Tahiti, Australia, Indonesia, Western part of U.S.A., also in several localities

of South America including Ecuador, Guayaquil. The records of Tahiti as the locality of several species from the collected material described by Stål have been already proved to be erroneous due to incorrect labelling of the material. 2) The genus Anisoscelis is known to occur only in the Neotropical region. 3) Subsequently to this expedition, A. discolor has not been recorded in surveys of Pacific fauna from Tahiti or any other South Pacific Islands. 4) In the course of this study four specimens from Guayaquil were found to be identical (and conspecific) with Stål's type of A. discolor. In view of the above evidence the record of Guayaquil Ecuador as the type locality of A. discolor and Tahiti as an erroneous record, is justified.

Material examined

a) Type material: Holotype ♀ of Diactor discolor Stål, from Ecuador, Guayaquil (type locality corrected) in NR collection, labelled "Taiti, Kinb, typus".

b) Other material: Ecuador, Guayaquil, 1 ♀ (TM); s.d., 1 ♂, 1 ♀ (IZA); s.d., 1 ♀ (BMNH).

Plate 18

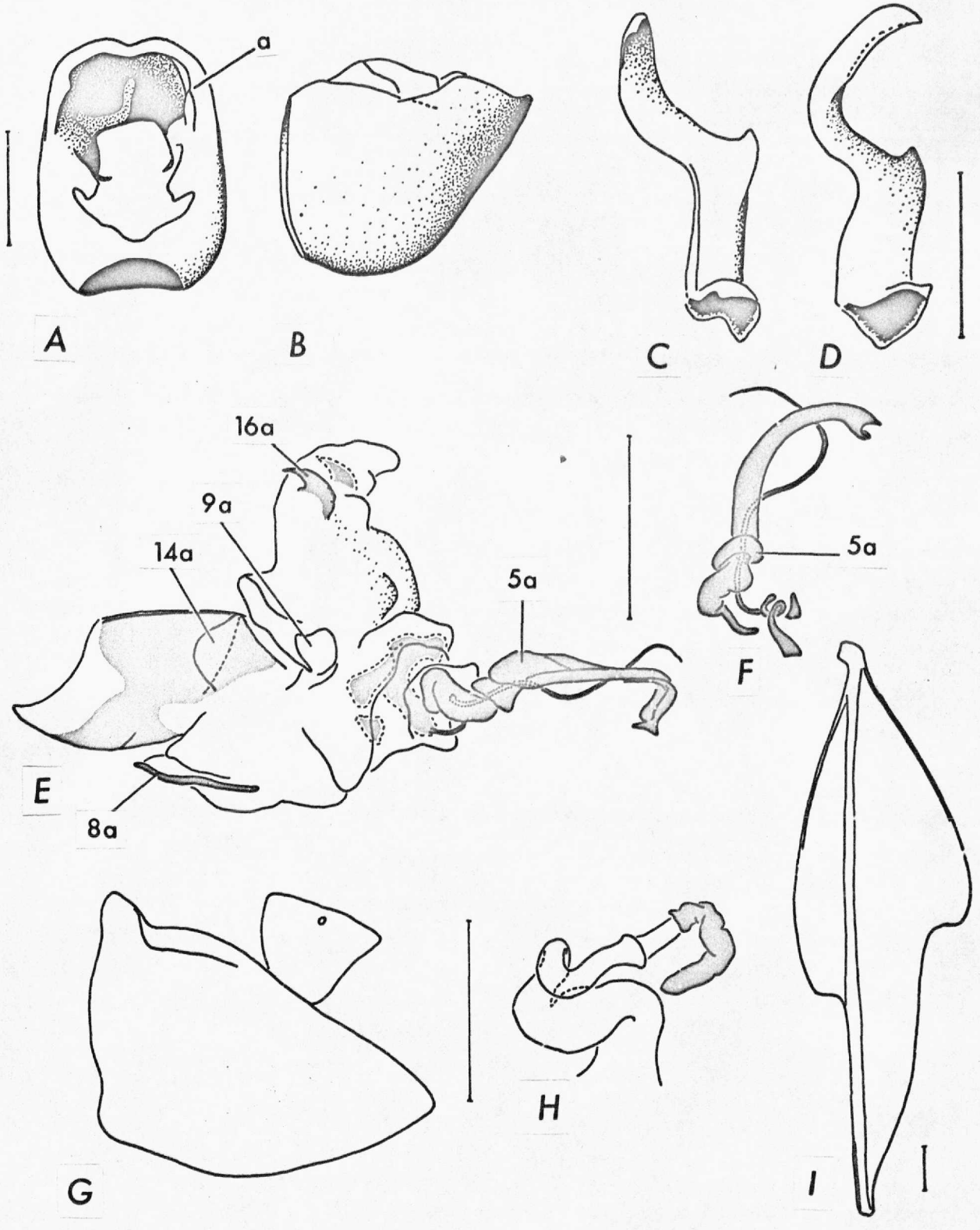


Table 15 Measurements (1 ♂ and 3 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	14.0	14.0	3	16.0-17.0	16.6
2 Head length	1	1.86	1.86	3	1.90-2.26	2.08
3 " width	1	1.99	1.99	3	2.12-2.26	2.18
Distance:						
4 inter-ocular	1	0.72	0.72	3	0.79-1.19	1.05
5 ante-ocular	1	1.00	1.00	3	0.81-1.14	0.95
Antennae:						
6 segm. I length	1	3.32	3.32	3	3.23-3.68	3.41
7 " II "	1	3.98	3.98	2	4.08-4.56	4.32
8 " III "	1	3.36	3.36	2	3.60-3.84	3.72
9 " IV "	-	---	---	2	4.12-4.32	4.22
Labium:						
10 segm. I length	1	1.90	1.90	3	2.09-2.39	2.22
11 " II "	1	1.90	1.90	3	1.90-2.39	2.15
12 " III "	1	0.95	0.95	3	1.14-1.52	1.27
13 " IV "	1	2.09	2.09	3	2.28-3.19	2.61
14 Pronotum length	1	2.59	2.59	3	2.68-3.36	2.98
15 " width	1	3.36	3.36	3	4.03-4.60	4.23
16 Scutellum length	1	1.95	1.95	3	2.09-2.31	2.22
17 " width	1	1.48	1.48	3	1.71-1.84	1.76
18 Hind tibia length	1	10.08	10.08	3	11.0-12.4	11.64
Tibial dilation:						
19 total width	1	2.44	2.44	3	3.93-3.12	3.47
external part:						
20 length	1	9.36	9.36	3	9.98-11.5	10.68
21 width	1	1.53	1.53	3	1.92-2.64	2.19
internal part:						
22 length	1	5.04	5.04	3	5.76-6.86	6.22
23 width	1	0.68	0.68	3	0.96-1.25	1.05
Ratios: (figures refer to character numbers above:						
1 / 2	1	7.52:1	7.52:1	3	7.50-8.42:1	7.98:1
1 / 18	1	1.38:1	1.38:1	3	1.36-1.48:1	1.42:1
2 / 3	1	0.93:1	0.93:1	3	0.89-1.00:1	0.95:1
6 / 2	1	1.78:1	1.78:1	3	1.59-1.70:1	1.63:1
10 / 2	1	1.02:1	1.02:1	3	0.96-1.14:1	1.06:1
9 / 6	1	---	---	2	1.17-1.23:1	1.23:1
15 / 16	-	1.72:1	1.72:1	3	1.76-1.99:1	1.90:1
20 / 18 %	1	92.8	92.8	3	90.3-92.4	91.7
22 / 18 %	1	50.0	50.0	3	52.1-54.9	53.4

Anisoscelis scutellaris Stål 1870

(Plate 19)

Anisoscelis scutellaris Stål, 1870: 159.3. LECTOTYPE ♂ Colombia (NR), here designated [examined, dissected].

Anisoscelis scutellaris Stål: Lethierry & Severin, 1894: 45.

General and differential diagnosis: Antenna dark yellow ochre to brownish; scutellum and a triangular patch on pronotum metallic green. Characteristic features of ♂♂: black patch on posterior margin of genital capsule, shape and size of the latter and of the paramere, and the shape and size of processes 8a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa, and the shape and size of spermatheca.

Description: Head. Basically cream to yellow ochre, with a median brownish patch extended from juga to the neck. First three labial segments yellow ochre, the IVth dark reddish brown with dark brown to black tip. All segments of antenna dark yellow ochre to brownish; posterior surface of Ist antennal segment, apex of the IInd and the whole IVth segment darker. Tylus curved, rather projecting anteriorly, level or slightly above juga; the latter swollen slightly expanded below the antenniferous tubercles, not projecting anteriorly, with curved medial margin. Labium reaching the posterior margin of IIIrd sternite. Thorax. Pronotum and corium pale brown; scutellum and a patch on posterior margin

of pronotum extending medially and anteriorly in form of a triangle up to the middle of pronotum, metallic green; calli dark yellow ochre; lateral margins, margins of scutellum and costal margin of corium, yellow ochre; tip of humeral angles, black; pleural and sternal areas yellow ochre. All legs yellow ochre to cinnamon, slightly darker distally; posterior surface of tibial dilation basically yellow orange, the widest median part reddish with some irregular yellow orange and yellow ochre patches; the distal half of margin on internal dilation, black; colouration of the anterior surface similar to the posterior but less intense. Pronotal calli slightly elevated; lateral margins with carina, which become more elevated and anteriorly expanded at the level of calli; collar usually with a conspicuous tubercle at the level of lateral margins; humeral angles acute, horizontal or raised, usually slightly deflected posteriorly; posterior margin concave. Abdomen. Tergites metallic green, with irregular yellow ochre patches close to connexivum and to the intersegmental sutures; connexivum yellow ochre with an oblique dark brown to black line extending from IInd to VIIth segment. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, cream to yellow ochre; genital capsule with a wide black patch on posterior margin.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with a wide "V" shaped median emargination, sinuous and below the level of lateral margins; the latter with small vertical inner protuberance (a), depressed at the level of proctiger, then gradually raised posteriorly; ventral ridge depressed medially. Parameres (fig. C,D) - shaft slightly curved, with a dorso-distal elevation (b) longer than in A. foliacea,

without dorsal carina; outer lobe conspicuous, wide, with rourded tip; shank flat and comparatively wide, strongly curved basally then straight, terminating in a long skewed blunt tip. Phallus (fig. E) - phallotheca dorsally, laterally and ventrally sclerotized, the degree of sclerotization ranging from heavy on ventral side to slightly on the dorsal side; processes 14a-b in lateral position, slightly sclerotized, subtriangular, and directed antero laterally; conjunctiva with slender dorsal sac, ending in an elongate postero-distal lobe, the postero lateral surface slightly sclerotized from the level of processes 16a-b to the base. Conjunctiva armed with the following processes: 16a-b heavily sclerotized, spinose and curved; 9a-b membranous, conspicuous with flat tip; 8a-b narrow, very long with blunt tips, the conjunctiva between processes a and b slightly sclerotized; 5a (fig. E,F) with Ist convolution sinuate, IIIrd convolution very slender and styliform, with not sclerotized margins. Processes 15a-b absent.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) short, comparatively wide at base, with a short closed ventrally directed curvature near the apex of the duct.

Measurements and Ratios: (see table 16)

Geographical distribution: (Map 5) Only known from two localities in Colombia and from Ecuador.

Discussion: The most important variation observed in the examined material were: the Ist antennal segment of the ♂ from Ecuador shows some

irregular reddish colouration on the latero-posterior surface. The metallic green pronotal patch of the lectotype and allotype is considerably shorter.

Material examined.

a) Type material: Anisoscellis scutellaris Stål, 1 ♂ and 2 ♀♀ syntypes: the ♂ from Colombia, Bogotá, labelled "typus, Bogotá, Lindig" in NRS, was designated and labelled as lectotype; the other two specimens with the same data as the lectotype, and labelled "Allotypus and Paratypus" respectively, were designated and labelled as Paralectotypes.

b) Other material: COLOMBIA: Muzo, Chapman, 1 ♂ (RNH). ECUADOR: Loja, 11 - VIII - 1896, P. Dognin, 1 ♂ (BMNH).

Plate 19

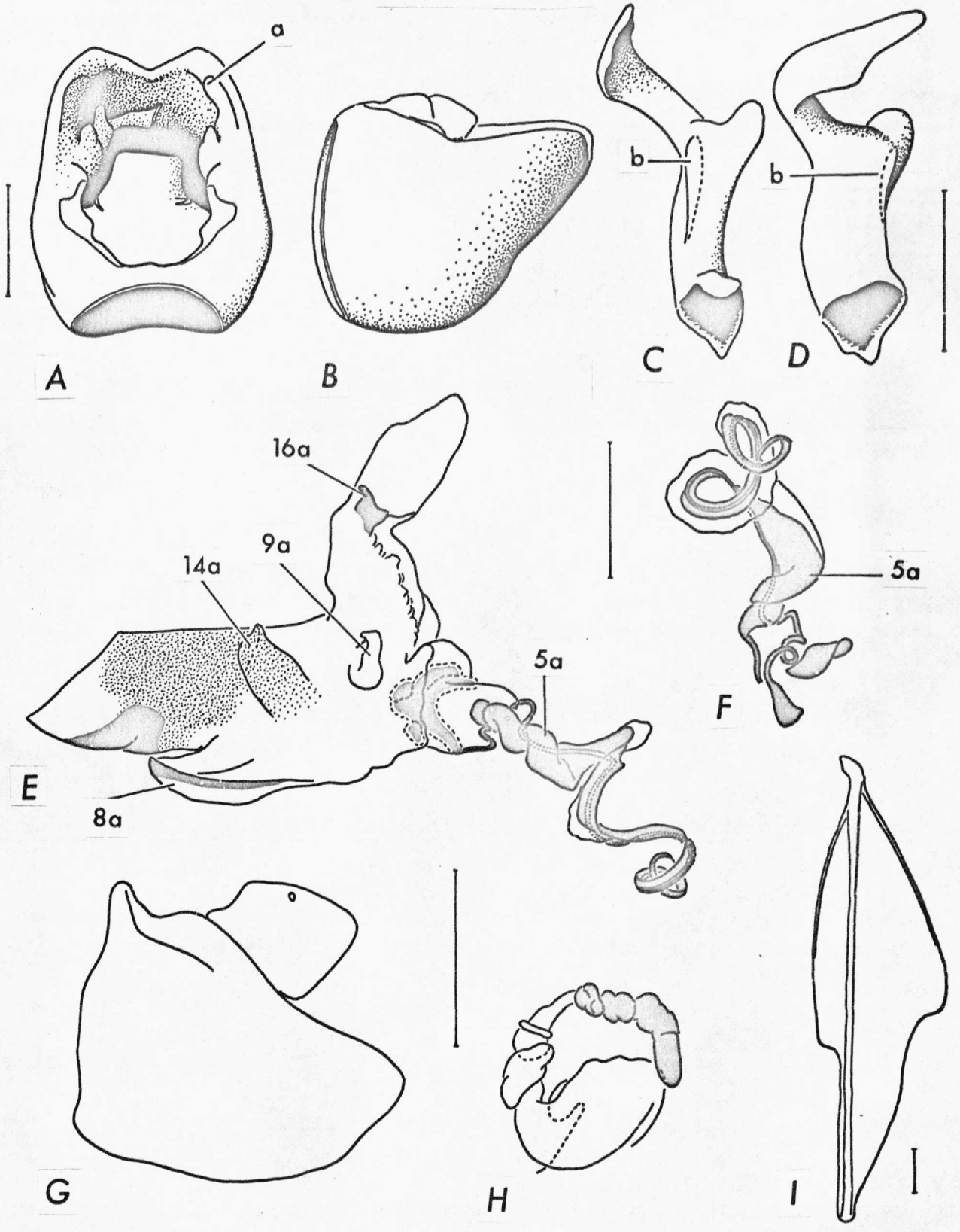


Table 16 Measurements (3 ♂♂ and 2 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	14.3-15.6	14.8	2	15.4-17.0	16.2
2 Head length	3	1.72-1.99	1.87	2	1.99-2.12	2.05
3 " width	3	1.99-2.10	2.04	2	2.12-2.26	2.19
Distance:						
4 inter-ocular	3	1.00-1.10	1.04	2	1.12-1.17	1.14
5 ante-ocular	3	0.68-0.76	0.71	2	0.79-0.83	0.81
Antennae:						
6 segm. I length	3	2.77-3.23	2.95	2	3.04	3.04
7 " II "	3	3.55-4.32	3.88	2	4.12-4.17	4.14
8 " III "	2	3.16-3.50	3.33	2	3.21-3.55	3.38
9 " IV "	2	3.64-3.84	3.74	2	3.60-3.84	3.72
Labium:						
10 segm: I length	3	1.90-1.99	1.96	2	2.16-2.28	2.22
11 " II "	3	1.52-1.99	1.80	2	2.18-2.28	2.23
12 " III "	3	1.00-1.14	1.08	2	1.08-1.14	1.11
13 " IV "	3	1.84-2.09	1.98	2	2.09-2.29	2.19
14 Pronotum length	3	2.54-2.83	2.70	2	2.97-3.02	2.99
15 " width	3	3.58-3.88	3.75	2	4.12-4.22	4.17
16 Scutellum length	3	1.80-2.14	1.98	2	2.24-2.28	2.26
17 " width	3	1.40-1.55	1.49	2	1.59-1.80	1.69
18 Hind tibia length	3	9.12-10.4	9.83	2	10.8-11.0	10.9
Tibial dilation:						
19 total width	3	2.40-3.16	2.76	2	3.26-3.69	3.47
external part:						
20 length	3	8.16-9.74	8.94	2	9.98-10.2	10.1
21 width	3	1.58-2.16	1.83	2	2.20-2.49	2.34
internal part:						
22 length	3	5.08-5.61	5.29	2	6.14-6.24	6.19
23 width	3	0.62-0.96	0.73	2	0.84-1.05	0.94
Ratios: (figures refer to character numbers above).						
1 / 2	3	7.68-8.31:1	7.91:1	2	7.26-8.54:1	7.90:1
1 / 18	3	1.47-1.56:1	1.50:1	2	1.42-1.53:1	1.48:1
2 / 3	3	0.86-0.94:1	0.91:1	2	0.93:1	0.93:1
6 / 2	3	1.50-1.62:1	1.57:1	2	1.43-1.52:1	1.48:1
10 / 2	3	1.00-1.10:1	1.04:1	2	1.01-1.14:1	1.08:1
9 / 6	2	1.18-1.27:1	1.26:1	2	1.18-1.26:1	1.22:1
15 / 16	3	1.81-1.94:1	1.89:1	2	1.83-1.85:1	1.84:1
20 / 18 %	3	89.4-93.1	90.9	2	92.4-93.0	92.6
22 / 18 %	3	52.1-55.7	53.8	2	56.6-57.7	56.6

BITTA gen. n

Type-species: Anisoscelis affinis Westwood

Diagnosis: Large elongate species. Head. Basically yellow ochre, with the whole dorsal surface darker; all segments of antenna either brownish to black with pale bands on anterior and posterior surfaces of Ist segment, or yellow ochre to reddish brown with or without a brown patch on external surface of the Ist segment. Head wider than long, very rarely as long as wide; declivent; not depressed behind the ocelli; tylus and juga below the level of antenniferous tubercles; juga swollen projecting below the latter, flattened antero laterally, with curved median margin; Ist antennal segment usually twice as long as the head; segments II to IV cylindrical, long and narrow. Thorax. Basically yellow ochre. Usually with yellowish white or yellow ochre markings on posterior margin of pronotum, lateral margins of scutellum and on veins of corium. Pronotum strongly declivent and puntated; calli indistinctly separated from each other, differently sculptured than the disk; lateral margins slightly sinuous, entire and not prominent; humeral areas gently raising towards the elevated, or occasionally horizontal humeral angles; postero lateral margins sinuous, usually entire; posterior margin moderately depressed, straight or somewhat concave, without pronotal extensions; scutellum slender, slightly punctate and somewhat rugose,

flat without distinct marginal ridges; femur of all legs always with one pair of apical spines; fore and middle femur with or without a row of gradually smaller spines, in line with the anterior apical spine; hind femur always with a row of such spines; hind tibia (fig. I) with external and internal dilation, the external being sinuous and emarginate, and longer than the internal one. Corium usually with yellowish white or yellow ochre veins, the costal margin and the boundary between corium and membrane; the latter dull brown or black. Abdomen. Tergites brownish; tergites II to VI with marginal triangular areas with irregular pattern of minute yellow ochre spots; sternites, Ist gonocoxa and laterotergite in females and genital capsule in males yellow ochre to pale orange.

Male genitalia: Genital capsule (fig. A,B) - with or without subproctigeral sac; posterior margin above or below the level of lateral margins; the latter sinuous and wide, sometimes with dorsal projections; ventral ridge with median process. Paramere (fig. C,D) - shaft widening distally, without dorsal carina; sometimes with medial and lateral carina; shank either short and wide or slender; distally curved. Phallus (fig. E): phallotheca dorsally and laterally slightly sclerotized; the lateral sclerotizations sometimes moderate and extending over the area above the bases of processes 14a-b and over a part of conjunctiva behind them; processes 14a-b in lateral position, projecting dorsally or laterally; conjunctiva with weak sclerotization between the bases of the processes 19a-b and 8a-b; conjunctiva armed with the following processes: 16a-b heavily sclerotized, vertical or horizontal, usually slender and flat; processes 18a-b and 19a-b usually membranous and not very prominent,

the latter sometimes weakly sclerotized; 9a-b conspicuous membranous each with a flat tip; 8a-b horizontal, with additional separate sclerotization at base; 20a-b sometimes present; 5a (fig. E,F) might be short with small and tightly coiled convolutions or slender with very conspicuous and comparatively loose convolutions. Processes 15a-b absent.

Female Genitalia: Spermatheca (fig. H) with the base either reduced or well developed; tubular, curved, occasionally somewhat coiled at base; without duct dilation; spermathecal bulb elongate sometimes slender and coiled.

Sculpture: Pleural region with shiny and dull areas, the shiny areas present on supracoxal lobes and postepineral flange II and III.

Pubescence: Body comparatively bare, with thick and short hairs on calli and on the disk of pronotum, and some very thin short hairs on coxae and on sternites, the hairs becoming more dense and longer on genital segments.

Geographical distribution: Only known from Central America, the northern part of South America and Trinidad.

Discussion: Bitta is related to and was formerly part of the genus Anisoscelis, the relationships between the two genera are indicated by sharing the following characters: head wider than long, very rarely as long as wide; juga swollen projecting below the antenniferous tubercles; antennal segments II to IV cylindrical, thin and long; basic colouration of thorax yellow ochre with pronotum, scutellum and corium with

colouration distinctly different from the rest of the thorax; calli with different sculpture than the disk; hind tibia with external and internal dilation. The genus Bitta can easily be distinguished from Anisoscelis by: head declivent; not depressed behind the ocelli; Ist antennal segment usually twice as long as the head; thorax without metallic shine, usually with yellowish white to yellow ochre markings on pronotum, scutellum and corium; pronotum strongly declivent; humeral areas gently raising towards the humeral angles; the latter usually elevated; external tibial dilation comparatively short not reaching the apex of the main shaft of tibia; dorsal region of abdomen brownish, with triangular patches on both sides of tergites II to VI; ventral ridge of genital capsule with median process; parameres widening apically without laterally skewed tip; dorsal sac of conjunctiva comparatively large, with processes 18a-b and 19a-b present; processes 8a-b very conspicuous, with additional sclerotizations of the membrane at base; conjunctiva sometimes weakly sclerotized between processes 19a-b and 8a-b.

KEY TO SPECIES

Genital capsule with posterior margin thick, almost vertical; ventral ridge of genital capsule with short process; outer lobe of paramere not reduced or pointed; processes 16a-b vertical; processes 8a-b rather short; processes 20a-b absent; process 5a short with small tight convolutions; tibial dilation relatively wide and short.....2

- Posterior margin of genital capsule not as above; ventral ridge of genital capsule with long process; outer lobe of paramere reduced and pointed; processes 16a-b horizontal; processes 8a-b rather long; processes 20a-b present; process 5a slender, with very conspicuous and rather loose convolutions; tibial dilation relatively narrow and long.....4

2 (1) Antennae dark yellow ochre; pronotum, scutellum and corium reddish brown without yellowish white or yellow ochre markings; all legs without dark bands; conjunctiva around processes 19a-b and the processes themselves weakly sclerotized.....
.....affinis (p.186)

- Antennae dark brown to black; pronotum, scutellum and corium different from the above, with yellowish white or yellow ochre markings, all legs with dark bands; lateral sclerotizations of conjunctiva not as above.....3

3 (2) Pronotum scutellum and corium brownish to orange brown, with cinnamon to yellow ochre markings; posterior margin of genital capsule with two internal and lateral protruding areas (pl. 21,a); outer lobe of parameres not well differentiated from main shaft; conjunctiva weakly sclerotized above processes 8a-b and around processes 19a-b.....
.....hymana (p.193)

- Pronotum dark yellow or reddish orange, with humeral angle and area between them black, posterior and postero lateral margins yellowish white; scutellum black; corium black or red, sometimes reddish orange to dull orange with the costal margin, longitudinal veins and the boundary between corium and membrane yellowish white; posterior margin of genital capsule sharply projecting dorsally from the lateral margins (Pl. 22, a); outer lobe of paramere very conspicuous; conjunctiva weakly sclerotized between processes 8a-b and processes 19a-b..... .....flavolineata (p.199)

4 (1) Head with a dark brown patch on dorsal surface of neck; pronotum corium and scutellum, brown, dark brown and black respectively; humeral angle, the area between them and usually lateral margins black; posterior margin of genital capsule moderately depressed.....gradadia (p.217)

- Head without brown patch on dorsal surface; pronotum, scutellum and corium pale brown to reddish brown; pronotum without black patches; posterior margin of genital capsule slightly depressed medially .....hymenifera (p.210)

Bitta affinis (Westwood) 1840 comb. n.

(Plate 20)

Anisoscelis affinis Westwood, 1840: 275. NEOTYPE ♂, Mexico (BMNH), here designated [examined, dissected].

Anisoscelis affinis Westwood: Stål, 1870: 159.7; Distant, 1881: 123.4, pl. 13, fig. 3; Lethierry & Severin, 1894: 45; Blöte, 1936:27.

Diactor rufus Dallas, 1852: 451. Holotype ♀, Honduras (BMNH), here rediscovered [Synonymized by Stål, 1870: 1597, examined, dissected]

General and differential diagnosis: All segments of antenna yellow ochre; pronotum, scutellum and corium reddish brown, with no markings; all legs yellow ochre with no longitudinal bands. Characteristic features of ♂♂: shape and size of genital capsule and parameres; shape and size of processes 16a-b, 18a-b, and 8a-b. Those of ♀♀: shape of the Ist gonocoxa, and shape and size of the spermatheca.

B. affinis shows close relationships with B. hyaana and B. flavolineata, sharing the wide and comparatively short tibial dilation, short and somewhat rounded genital capsule, short processes of ventral ridge of genital capsule, vertical processes 16a-b of conjunctiva, process 5a small with a short convolution. (See also differential diagnosis of the other two species).

Description: Head. Basically yellow ochre, with the whole dorsal surface darker. Ist labial segment yellow ochre; the other segments becoming gradually brownish to reddish brown distally, apex of IVth segment black. All segments of antenna dark yellow ochre, becoming brownish distally. Tylus curved, slightly or not projecting beyond juga, level or slightly above juga. Labium not reaching beyond the IIIrd sternite.

Thorax. Pronotum, scutellum and corium pale brown to reddish brown; the latter occasionally reddish becoming more intense along veins; pleural and sternal areas yellow ochre. All legs yellow ochre, with femur gradually slightly darker distally; posterior surface of tibial dilation basically yellow orange, the middle part reddish brown to dull red, with some irregular yellow orange patches; distal portion of the margin of internal dilation black; colouration of anterior surface of tibial dilation similar to the posterior one but less intense. Pronotal calli slightly raised; humeral angles prominent, acute, raised and slightly deflected posteriorly; postero-lateral margins occasionally dentate; posterior margin straight or slightly concave. Hind tibia (fig. I) with concave foliaceous dilation i.e. with raised margins; the external dilation extending over $\frac{3}{4}$ of the length of tibia, sinuous and rapidly tapering posteriorly. Abdomen. Tergites brownish, the posterior margins of each tergite slightly darker; connexivum reddish brown to brownish. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - genital cavity closed behind by an almost vertically raised posterior margin, which is thick, slightly sinuous and level with lateral margin; the latter sinuous, wide, deflected inward, each with heavily sclerotized area (a) close to the base of proctiger. Paramere (fig. C,D) - outer lobe conspicuous, wide, with more or less rounded tip; shank short, flat very wide at base slightly curved, with acute tip. Phallus (fig. E) - phallotheca dorsally and laterally sclerotized; processes 14a-b slightly sclerotized, conspicuous,

triangular, in lateral position and projecting dorsally; conjunctiva with very long dorsal sac, terminating in an elongate postero distal lobe. Conjunctiva armed with the following processes: 16a-b vertical, heavily sclerotized, spinose, slender and almost straight; 18a-b membranous, narrow and bilobed; 19a-b weakly sclerotized, elongate with rounded tip, with the area around these lobes weakly sclerotized; 9a-b membranous, conspicuous, with flat tip; 8a-b very conspicuous, well sclerotized, with rounded tip; 5a (fig. E,F) short, narrow and almost in straight line; Ist and IInd convolutions, very similar in size and shape; the IIIrd reduced.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) slender, tubular, with small not very conspicuous base.

Measurements and Ratios: (see table 17)

Geographical distribution: (Map 6) Only known from Mexico, Guatemala, Honduras and Costa Rica in Central America.

Habitat and Biology: Adults were collected in February and April. Fully developed eggs were observed in two females, whose collection date were not recorded; the eggs are cupuliforms, length 2.09mm, width 1.19mm, height 1.14mm.

Material examined

a) Type material: Neotype ♂ of Anisoscelis affinis Westwood. The

type specimen could not be found in the MNHN where it was supposed to be; the original description was given by Westwood as comparative reference when describing A. hymeniphera and is very brief and incomplete. Although B. affinis can easily be distinguished from the other species of the genus it has been often confused with specimens of B. hymenifera. In the interest of stability of nomenclature, the designation of a neotype is considered necessary; a ♂ from Mexico, Vera Cruz, labelled "Vera Cruz 54 bb" in BMNH collection was chosen and accordingly labelled as neotype of Anisoscelis affinis Westwood.

Holotype ♀ of Diactor rufus Dallas, from Honduras, labelled "Honduras 45-123" in BMNH.

b) Other material: GUATEMALA: Panzos, Vera Paz, Champion, 1 ♂, 1 ♀ (BMNH); Chacoj, Vera Paz, Champion, 1 ♀ (BMNH). HONDURAS: Punta Gorda, - IV - 1935, J.J. White, 1 ♂ (BMNH); 1 ♀ (BMNH); 1 ♀ (NR). MEXICO: Temax, N. Yucatan, Gaumer, 3 ♀ (BMNH); s.d., 1 ♂ (IZA); 1 ♀ (IZA); Oaxaca, Puerto Angel, 1903, L. Diguet, 1 ♀ (MNHN); Atoyx, Vera Cruz, Schumann, 1 ♀ (ZI); Orizaba, - II - 1883, Bilimek, 2 ♀ (NM); Vera Cruz, 1 ♂ (NM), Teapa, Tabasco, January, H.H. Smith, 1 ♀ (BMNH).

Material without data: 1 ♂ labelled "A. affinis del Blöte, (RNH).

Plate 20

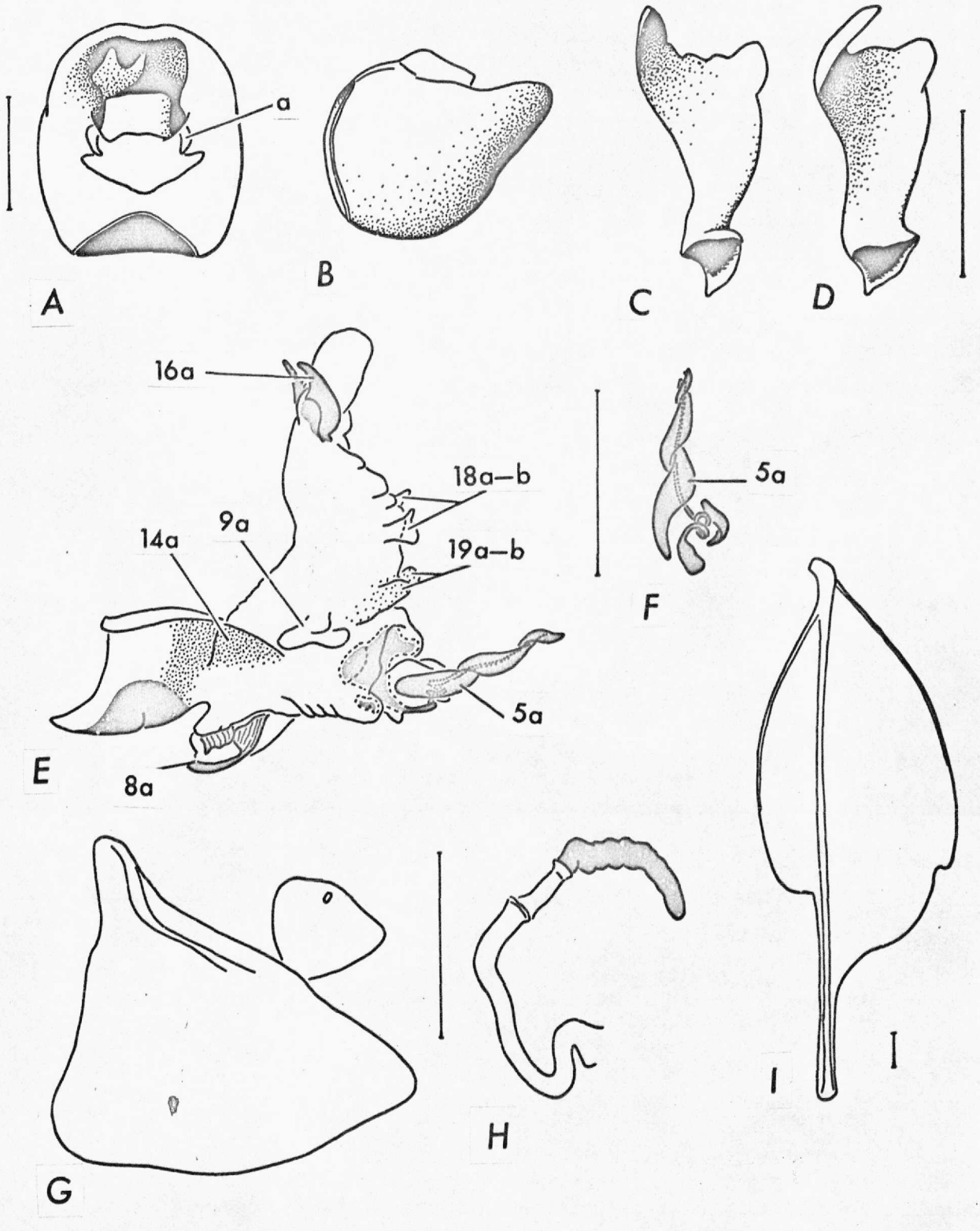


Table 17 Measurements (5 ♂♂ and 5 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.7-20.0	18.42	5	18.7-20.0	19.2
2 Head length	5	1.99-2.24	2.14	5	2.24-2.47	2.31
3 " width	5	2.01-2.39	2.26	5	2.29-2.41	2.35
Distance:						
4 inter-ocular	5	1.06-1.36	1.27	5	1.31-1.36	1.33
5 ante-ocular	5	0.76-0.95	0.89	5	0.95-0.98	0.95
Antennae:						
6 segm. I length	5	4.75-5.76	5.37	5	5.28-4.80	4.99
7 " II "	5	5.04-6.48	5.90	4	5.61-6.05	5.87
8 " III "	5	3.69-4.94	4.51	4	4.32-4.65	4.42
9 " IV "	2	4.80-5.37	5.37	2	4.80-5.28	5.04
Labium:						
10 segm: I length	5	2.28-2.56	2.41	5	2.47-2.62	2.50
11 " II "	5	2.18-2.39	2.45	5	2.37-2.52	2.47
12 " III "	5	1.14-1.42	1.30	5	1.14-1.36	1.33
13 " IV "	5	2.18-2.85	2.50	5	2.47-2.79	2.65
14 Pronotum length	5	3.26-4.17	3.55	5	3.45-3.88	3.75
15 " width	5	4.60-5.52	5.26	5	5.56-6.00	5.72
16 Scutellum length	4	2.26-2.85	2.52	4	2.66-2.77	2.70
17 " width	5	1.71-2.14	2.10	5	2.05-2.14	2.13
18 Hind tibia length	5	13.4-16.6	15.1	4	15.7-16.8	16.3
Tibial dilation:						
19 total width	5	5.28-6.86	5.91	4	5.28-6.24	5.76
external part:						
20 length	5	10.1-12.6	11.5	4	11.5-13.1	12.1
21 width	5	3.36-4.56	3.91	4	3.16-4.08	3.85
internal part:						
22 length	5	7.58-8.78	8.99	4	8.64-9.60	8.81
23 width	5	1.53-2.01	1.82	4	1.92-2.01	1.94
24 Undilated portion	5	2.73-3.12	2.99	4	3.07-3.36	3.21
Ratios: (figures refer to character numbers above).						
1 / 2	5	7.87-9.54:1	8.57:1	5	7.93-8.92:1	8.32:1
1 / 18	5	1.08-1.21:1	1.21:1	4	1.13-1.24:1	1.18:1
2 / 3	5	0.86-1.05:1	0.93:1	5	0.94-1.06:1	0.98:1
6 / 2	5	2.24-2.64:1	2.50:1	5	2.10-2.35:1	2.16:1
10 / 2	5	1.07-1.19:1	1.12:1	5	1.06-1.10:1	1.08:1
9 / 6	2	0.90-1.02:1	0.94:1	2	0.90-1.10	1.01:1
15 / 16	4	1.90-2.42:1	2.08:1	4	2.06-2.21	2.11:1
20 / 18 %	5	75.6-77.5	76.5	4	71.9-77.9	74.6
22 / 18 %	5	52.0-56.3	53.5	4	49.3-57.1	54.1

Bitta hymana sp. n.

(Plate 21)

General and differential diagnosis: Pronotum, scutellum and corium brownish to orange brown with cinnamon to yellow ochre markings. Characteristic features of ♂♂: shape and size of genital capsule, particularly the presence of two internal and laterally protruding areas on posterior margin; shape and size of parameres; the shape and size of processes 16a-b, 18a-b, and 8a-b. Those of ♀♀: shape of first gonocoxa and shape and size of spermatheca. B. Hymana is closely related to B. affinis and B. flavolineata. From B. affinis it can be distinguished by: the dark brown colouration of antenna; cinnamon to yellow ochre markings on pronotum, scutellum and corium, and dark brown bands on legs. For differences with B. flavolineata see description of the latter.

Description: Head. Basically yellow ochre, with the whole dorsal surface darker. Ist labial segment yellow ochre; the rest becoming brownish to dark brown distally, apex of IVth antennal segment black. All segments of antenna dark brown, the Ist with a yellow ochre longitudinal band on anterior and posterior surfaces; IInd antennal segment with anterior surface of base yellow ochre. Tylus curved, not projecting anteriorly, level or slightly above juga. Labium not reaching beyond the IIIrd sternite. Thorax. Pronotum, scutellum and corium brownish to orange brown, with the following parts cinnamon to yellow

ochre: On pronotum - posterior and postero-lateral margins. On scutellum - lateral margins and a median longitudinal line. On corium - costal margin, and all veins, including vein Pcu of clavus. Pleural and sternal areas yellow ochre. All legs yellow ochre. Trochanter of all legs with a narrow dark brown band on anterior and posterior surfaces. Femur of all legs with narrow dark brown longitudinal bands extending along the anterior, posterior and external surfaces. Tibia of fore and middle legs with two dark brown longitudinal bands extending along the anterior and posterior surfaces; the anterior one thin, and the posterior wide. Posterior surface of tibial dilation basically yellow ochre, the middle part reddish brown to dull red, with some irregular yellow ochre patches; margin of internal dilation at its distal portion black; colouration of the anterior surface similar to the posterior one but paler. Pronotal calli slightly elevated; humeral angle prominent, acute, raised and slightly deflected posteriorly; postero-lateral margins entire; posterior margins straight or slightly concave. Hind tibia (fig. I) with concave foliaceous dilation i.e. with raised margins; the external dilation extending over $\frac{3}{4}$ of the length of tibia, sinuous and rapidly tapering posteriorly. Abdomen. Tergites brownish, with the posterior margin of all tergites slightly darker, and the anterior margins paler; connexivum brownish. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - genital cavity closed behind by an almost vertically raised posterior margin, which is thick, slightly below the lateral margins and has two internal and lateral

protruding areas (a); lateral margins sinuous, and wide, elevated at the level of proctiger and deflected inward, with two slightly more sclerotized areas (b) on each side of bases of proctiger. Paramere (fig. C,D) - outer lobe not very conspicuous, hardly differentiated from main shaft, with rounded tip; shank short, flat and wide, very wide and slightly curved at base, with acute tip. Phallus (fig. E) - phallotheca, dorsally and laterally sclerotized; processes 14a-b moderately sclerotized, conspicuous, triangular in lateral position and projecting dorsally. Conjunctiva with very long dorsal sac, terminating in a elongate postero distal lobe; weakly sclerotized laterally between the bases of processes 8a-b and 9a-b. Conjunctiva armed with the following processes: 16a-b heavily sclerotized, long and wide, almost straight terminating distally in a flat blunt tip; 18a-b membranous and small; 19a-b weakly sclerotized, elongate with blunt tip, the area around these lobes weakly sclerotized; 9a-b membranous, conspicuous with flat tip; 8a-b very conspicuous, heavily sclerotized and with a flat blunt tip; 5a (fig. E,F) short, narrow and almost in straight line, with the Ist and IInd convolutions very similar and elongate and the IIIrd reduced.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in Fig. G; spermatheca (fig. H) slender, tubular, with small, not very conspicuous base.

Measurements and Ratios: (see table 18)

Geographical distribution: (Map 6) Only known from the type locality, Costa Rica.

Material examined.

a) Type material: Holotype ♂ of Bitta hymana, from Costa Rica, labelled "Museum Paris, Costa Rica, 1920, Paul Serre" in MNHN collection.

Paratypes: COSTA RICA: 1921, P. Sarre, (Allotype) (1 ♀, MNMH); 1 ♀, labelled "BM 1953 - 629, from Perth Museum" (BMNH).

Plate 21

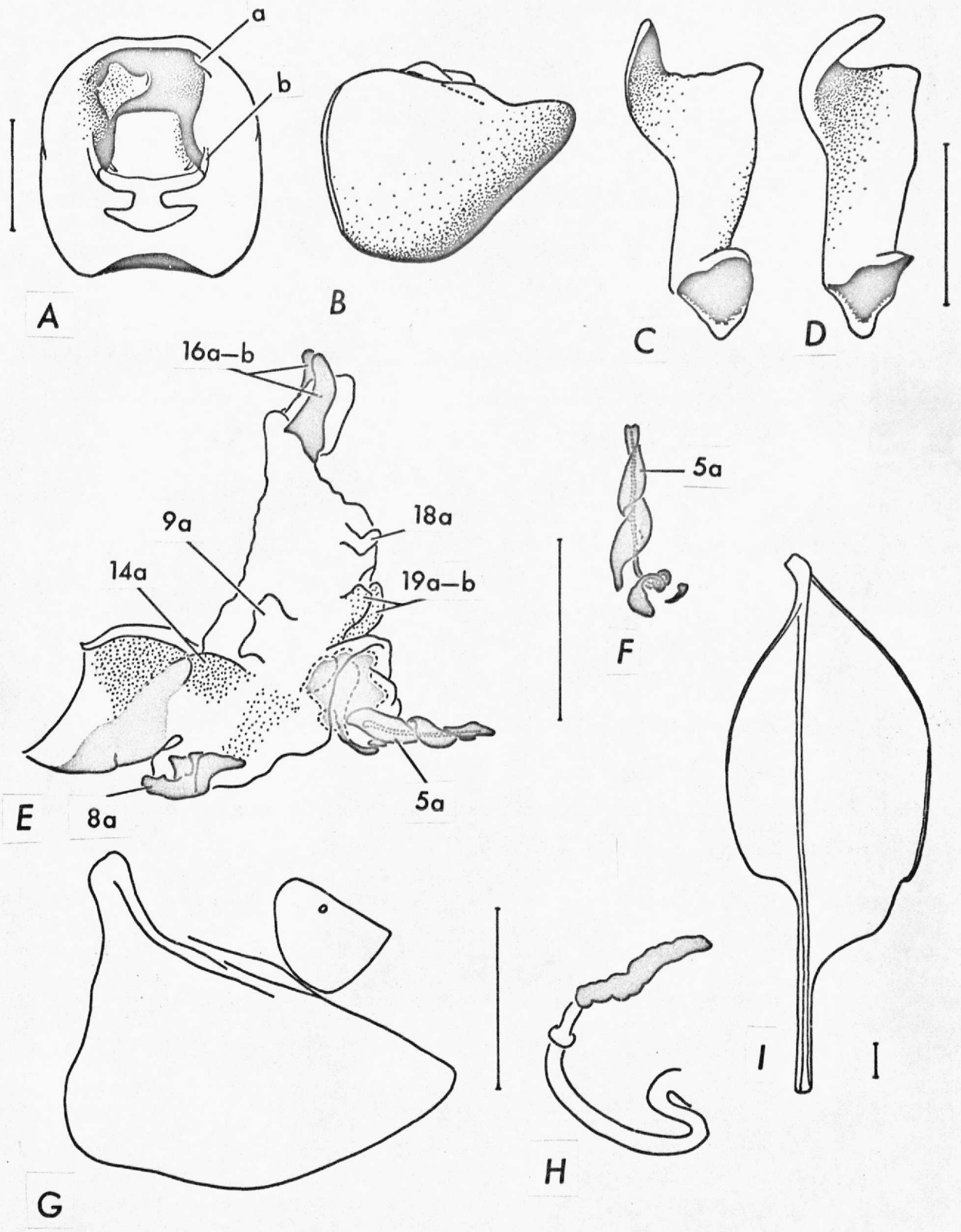


Table 18 Measurements (1 ♂ and ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	18.0	18.0	2	18.0-19.0	18.5
2 Head length	1	2.18	2.18	2	2.28-2.41	2.34
3 " width	1	2.39	2.39	2	2.41-2.47	2.44
Distance:						
4 inter-ocular	1	1.33	1.33	2	1.33-1.38	1.35
5 ante-ocular	1	0.96	0.96	2	0.95-1.02	0.98
Antennae:						
6 segm. I length	1	5.28	5.28	2	4.80-5.47	5.13
7 " II "	1	5.76	5.76	2	5.80-5.90	5.85
8 " III "	1	4.32	4.32	2	4.17-4.46	4.31
9 " IV "	1	4.80	4.80	-	---	---
Labium:						
10 segm. I length	1	2.37	2.37	2	2.47-2.51	2.49
11 " II "	1	2.28	2.28	2	2.47-2.56	2.51
12 " III "	1	1.23	1.23	2	1.25-1.46	1.35
13 " IV "	1	2.26	2.26	2	2.49-2.56	2.52
14 Pronotum length	1	3.50	3.50	2	3.69-3.84	3.76
15 " width	1	5.47	5.47	2	5.66-5.76	5.71
16 Scutellum length	1	2.58	2.58	1	--	2.77
17 " width	1	2.09	2.09	2	2.28	2.28
18 Hind tibia length	1	15.12	15.12	1	16.80	16.80
Tibial dilation:						
19 total width	1	5.90	5.90	1	6.24	6.24
external part:						
20 length	1	11.52	11.52	1	12.09	12.09
21 width	1	3.84	3.84	1	4.80	4.80
internal part:						
22 length	1	8.01	8.01	1	8.29	8.29
23 width	1	1.92	1.92	-	---	1.92
24 Undilated portion	1	3.12	3.12	1	3.21	3.21
Ratios: (figures refer to character numbers above).						
1 / 2	1	8.25:1	8.25:1	2	7.46-8.33:1	
1 / 18	1	1.08:1	1.08:1	1	1.13:1	1.13:1
2 / 3	1	0.92:1	0.92:1	2	0.94-0.97:1	0.95:1
6 / 2	1	2.64:1	2.64:1	2	2.10-2.26:1	2.19:1
10 / 2	1	1.17:1	1.17:1	2	1.02-1.10:1	1.06:1
9 / 6	-	0.90:1	0.90:1	-	---	---
15 / 16	1	1.93:1	1.93:1	1	2.04:1	2.04:1
20 / 18 %	1	75.9	75.9	1	71.9	71.9
22 / 18 %	1	52.8	52.8	1	49.3	49.3

Bitta flavolineata (Blanchard), 1849 comb. n.

(Plate 22)

Anisoscelis flavolineatus Blanchard, 1849, pl. 6, fig. 7. NEOTYPE ♂, Colombia (BMNH), here designated [examined, dissected].

Anisoscelis flavolineata Blanchard: Stål, 1870: 159.8; Lethierry & Severin, 1894: 45; Distant, 1881: 123.5; Blöte, 1936: 27.

Anisoscelis alipes Guérin, 1833, pl. 75 (lost) syn.n.

General and differential diagnosis: Pronotum dark yellow to reddish orange with a black patch between humeral angles; corium black or red to orange with yellowish white markings. Characteristic features of ♂♂: the shape and size of genital capsule; shape and size of parameres; shape and size of processes 16a-b, 18a-b and 8a-b, extension of conjunctival sclerotization from processes 8a-b to processes 19a-b and over the processes 9a-b. Those of ♀♀: shape of first gonocoxa and shape and size of spermatheca. B. flavolineata resembles B. affinis and B. hymana. From B. affinia and B. hymana it can be distinguished by: the colour pattern of pronotum and corium, the presence of a black scutellum and a black transverse band near the distal part of tibial dilation; from B. affinis also by the dark brown to black colouration of antenna, and the brown to black bands on the legs.

Description: Head. Basically yellow ochre to orange brown; specimens with the paler colouration have the whole dorsal surface darker. First three segments of labium with the same range of colouration as the head, with the anterior median surface usually brownish or brown; IVth labial segment entirely dark brown to black. All segments of antenna dark brown to black; the Ist with a yellow ochre longitudinal band on anterior and posterior surfaces; IInd antennal segment with anterior surface of base yellow ochre. Tylus curved, not projecting anteriorly or slightly above juga. Labium not exceeding the IIIrd sternite. Thorax. Scutellum black, with margins and a median longitudinal band yellowish white; pronotum and corium with yellowish white markings; pleural and sternal areas yellow ochre to reddish orange. All legs yellowish white to yellow ochre. Trochanter of all legs with a narrow dark brown to black band on anterior and posterior surfaces. Femur of all legs with narrow dark brown to black longitudinal band on the anterior, posterior and external surfaces; distal part of hind femur yellow ochre to yellow orange. Tibia of fore and middle legs with two dark brown to black longitudinal bands extending on anterior and posterior surfaces; the anterior one thin and the posterior wide. Posterior surface of tibial dilation basically yellow orange, the middle part reddish orange to dark red, with an irregular yellow orange patch, the latter with or without small dark red to black spots; margin of internal dilation at its distal portion black, usually extended to most of the distal area, and as a transverse band, across the main shaft up to the margin of the external dilation; colouration of the anterior surface similar to the posterior one but less intense. Pronotal calli

slightly elevated; humeral angle acute or spinose, raised and deflected posteriorly; postero lateral margin sinuous and entire; posterior margin straight. Hind tibia (fig. I) with concave foliaceous dilation i.e. with raised margins, the external dilation extending over $\frac{3}{4}$ length of tibia and sinuous. Abdomen. Tergites brownish, with the anterior and posterior margins of all tergites yellow ochre and brown respectively; VII tergite with a pair of patches and a median longitudinal line yellow ochre; connexivum dark brown to black. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males yellow ochre to pale orange.

Male genitalia: Genital capsule (fig. A,B) - genital cavity closed behind by an almost vertically raised posterior margin, which is thick and level with the lateral margins; the latter is sinuous, wide and deflected inward. Paramere (fig. C,D) - outer lobe very conspicuous, triangular, usually straight with rounded tip; shank comparatively long, distally slightly curved dorsally, and with a lateral terminal tip. Phallus (fig. E) - phallotheca with processes 14a-b in lateral position well sclerotized, not very conspicuous, slightly rounded and projecting laterally. Conjunctiva with very elongate dorsal sac, ending in an elongate postero distal lobe; weakly sclerotized laterally from bases of processes 8a-b to 19a-b. Conjunctiva armed with the following processes: 16a-b vertical, heavily sclerotized, slender, almost straight, terminating in a flat subacute tip; 18a-b membranous and small; 19a-b weakly sclerotized, not prominent; 9a-b weakly sclerotized, conspicuous and flat; 8a-b very conspicuous, heavily sclerotized, and with flat, elongate,

blunt tip; 5a (fig. E,F) short, narrow and almost in straight line.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) comparatively slender, tubular, with small, not very conspicuous base.

Geographical distribution: (Map 7) This species was recorded from the northern part of South America and part of Central America: Colombia, Venezuela, Guyana, Trinidad, Panama, Costa Rica and Peru.

Habitat and Biology: Adults of the subspecies rubica were collected in Venezuela in February, May. June, August, September, November and December; which suggest that the adults are present throughout the whole year. Two females collected in May and December respectively were found with developed eggs; the eggs are cupuliforms, length 1.99mm, width 1.33mm, height 1.38mm.

B. flavolineata rubica has been collected in Venezuela in two ecological zones: Premontane moise forest, and Lower Montane wet forest, at 450 to 1200m of altitude. One male of the nominal subspecies from Costa Rica, was observed with an egg of Tachinid (Diptera), possibly Trichopoda pennipes Fabr., deposited on the VI abdominal tergite.

Discussion: Two geographic forms are present in B. flavolineata, showing no differences in external morphology and genitalia, but striking differences in colouration, both forms seem to be allopatric, no intermediate area of contact could be observed because all the material

studied clearly belongs to one of the two forms, one specimen shows what could be regarded as intermediate fenotypical condition but its location is at the extreme of the distribution range of the species, which is perhaps an indication of the existence of another form. The two forms described later have been given subspecific rank.

Bitta flavolineata flavolineata (Blanchard) 1849

Differential diagnosis: Pronotum dark yellow with area between humeral angles and themselves black, posterior and postero lateral margins yellowish white. Humeral angles acute. Corium black, with costal margin, longitudinal veins and boundary between corium and membrane yellowish white. Tibial dilation with reddish orange colouration, generally without small dark red to black patches on the central yellow orange area; external dilation comparatively short, sinuous but not emarginate; distal part of hind tibia black.

Measurements and ratios: (see table 19)

Geographical distribution: (Map 7.) This subspecies seems to be distributed from Costa Rica to Colombia, and also was collected from Peru.

Discussion: No type of Anisoscelis alipes Guérin could be found in the MNHN where it was supposed to be, fortunately its description refer mainly to colouration and is complemented by a detailed illustration. Both entirely agree with Bitta flavolineata flavolineata as is here defined, and consequently Anisoscelis alipes is here formally synonymized

with the latter species.

Material examined.

a) Type material: Neotype ♂ of Anisoscelis flavolineatus Blanchard. The type specimen of the latter species could not be located in the collection of the MNHN; it was never described so the only existing reference to that species is its original illustration. Because of the geographical variability observed in B. flavolineata, it is abvisable in the interest of stability of nomenclature, to designate a neotype; such designation undoubtedly will be of great value for the identification of specimens who shows intergradacion between the two subspecies, which could be confused with a similar species Bitta gradadia. A male specimen from Colombia, Bogotá, labelled "Bogota, 89-157" in BMNH collection, was chosen and labelled as neotype of Anisoscelis flavolineatus. This specimen fully agree with Blanchard's original illustration.

b) Other material: COLOMBIA: 2 ♂, 1 ♀ (MNHN); 1886, A. Sallé 2 ♂ (MNHN); Valle del Magdalena, M. Andre, 1 ♂ (MNHN); Nueva Granada, Minas de Muzo, 1884-5, R. Oberthür, 1 ♀ (RNH); Cauca, 1 ♂ (RNH), San Antonio, 1 ♂ (RNH); Bogotá, Lindig, 1 ♂, 2 ♀ (NR); 1 ♂ (TM), Ocana, Signoret, 2 ♀ (NM); Rio Mikay, 1928, W. Hopp, 1 ♀ (MNHU); Krakow, 1 ♀ (MNHU); Dept. Tolima, Hda., Iconoza, 1500m W. Hopp, ♂ (MNHU); Bogotá, 1 ♂ (MNHU); s.d., 1 ♂ (BMNH). COSTA RICA: Bovallius, 1 ♂ (NR); Sta. Domingo, Golfo dulce, H. Pittier, 1 ♂ (TM); San Carlos, S. Burgdorf, 1 ♂ (ZSBS); San José, C. Werckle, 2 ♀ (MNHU). PANAMA: Chiriquí, 1 ♂, 2 ♀ (NR); 1 ♂ (NR); Chiriqui, Ribbe, 1 ♀ (MNHU), Boucard, 1 ♂ (BMNH). PERU; Chanchamayo,

M. Freymann, 1 ♂ (MNHU); Pavon, (MNHU).

c) Material without data: 2 ♂, labelled "South America, 1852, Foutanier" (MNHN); 1 ♀, labelled "Thirot Coll.", (IRSNB); 1 ♂, labelled C. Van Voixen Coll., No. 3472, (IRSNB); 1 ♀, labelled "No. 364", (TM); 2 ♀, labelled "Col. Prinz, 1899" (NM); 1 ♂, labelled "BM 1953 - 629. From Perth Museum" (BMNH).

Bitta Flavolineata rubica ssp.n

Differential diagnosis: Pronotum reddish orange, with humeral angles and the areas between them black; posterior and postero lateral margins yellowish white. Humeral angles spinose. Corium usually red, although in some specimens it seems to be reddish orange or dull orange; costal margin and boundary between corium and membrane yellowish white; most of embolium, claval cleft and posterior margin of clavus black. Tibial dilation with red to dark red colouration, in some specimens almost dark brown, but always with dark red to black patches on the yellow orange central area; external dilation longer than in the nominated subspecies, sinuous and emarginate; distal part of hind tibia yellow orange.

Measurements and Ratios: (see table 20)

Geographical distribution: (Map 7) The distributional range of this subspecies seem to be confined to the northern part of Colombia, Venezuela and Guyana, being found also in Trinidad.

Discussion: The most important variation observed in the examined material were as follows: The more orange condition of the corium seems to be restricted to the most oriental population in Venezuela, and seems to be dominant in Trinidad. One specimen from Guyana can be regarded as intermedius between both subspecies, although its locality is not intermediary between the area of distribution of both subspecies. This specimen ♀ resemble more rubica but has the corium dull brown, with the veins yellow ochre.

Material examined.

ANTILLES: Trinidad: 4 - xii - 1936, M.E. Fontoaine, 1 ♀ (BMNH); Brancsik, 2 ♀ (TM). COLOMBIA: 1 ♂ (TM); Rio Negro, 1 ♂ (RNH). GUYANA: Mazaruni, Teak Plantation, 21 - viii - 1937, Richards & Smart, 1 ♀ (BMNH). VENEZUELA: Aragua: Rancho Grande, 1100m, 19 - II - 1966, F. Fernández Yepez, 1 ♂ (IZA); s.l., 12 - IX - 1953, J.A. González, 1 ♀ (IZA); s.l., 21 - V - 1961, A. D'ascoli, A. Pérez, 1 ♀ (IZA); s.l., 5 - VI - 1958, F. Fernández Yépez, 1 ♀ (IZA); E.L. Limón 450m, 14 - VI - 1962, M. Gelbes, 3 ♂ (IZA); s.l., 23 - V - 1956, Armas, 1 ♀ (IZA); Cumbre de Choroní, 23 - V - 1948, F. Fernández Yépez, 1 ♀ (IZA). Merida: Briceño, 1 ♂ (TM); 1 ♂ (MNHU); 1 ♀ (NR); 1884 (NM); 12 - VI - 65 1 ♀ (ZSBS); Monagas: Caripe, 24 - IX - 1965, P. Salazar; Dist. Federal: Caracas, 1 ♀ (IRSNB); La Guayra, 1 ♂ (MN).

c) Material without data: 1 ♂, 1 ♀, labelled "109" (NR); 1 ♂, 1 ♀, labelled "1895, G. Fallov (MNHN).

Plate 22

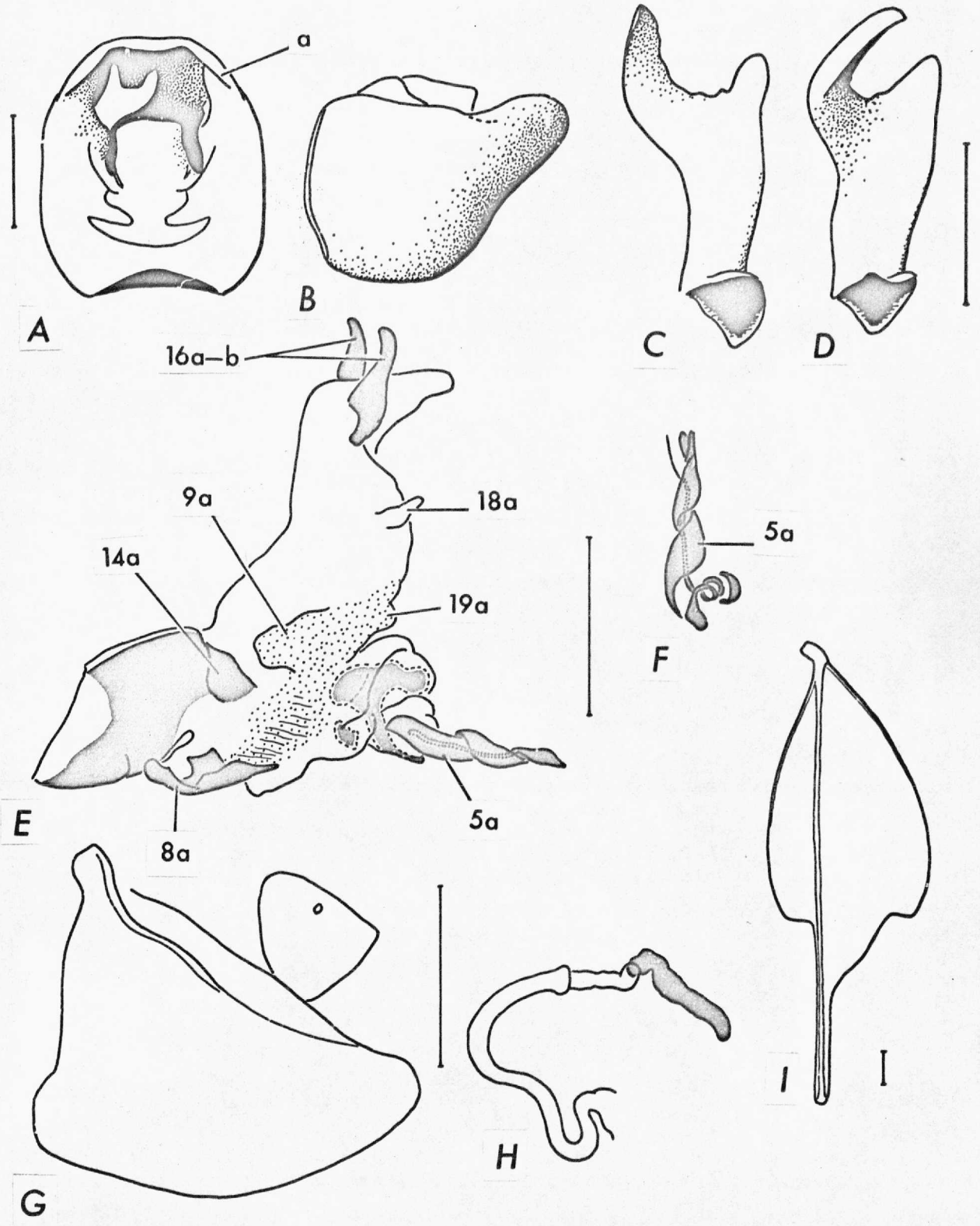


Table 19 Measurements (3 ♂♂ and 2 ♀♀ from 4 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	15.6–17.0	16.0	2	18.0	18.0
2 Head length	3	1.90–2.12	2.03	2	2.26–2.37	2.31
3 " width	3	2.26–2.37	2.32	2	2.51–2.58	2.54
Distance:						
4 inter-ocular	3	1.17–1.29	1.25	2	1.34–1.36	1.35
5 ante-ocular	3	0.76–0.81	0.78	2	0.93–0.95	0.94
Antennae:						
6 segm. I length	3	4.94–5.47	5.23	2	5.42–5.66	5.54
7 " II "	3	5.18–5.66	5.45	2	6.00–6.33	6.16
8 " III "	3	4.08–4.46	4.25	2	4.56–4.94	2.28
9 " IV "	–	—	—	1	5.90	5.90
Labium:						
10 segm. I length	3	2.28–2.51	2.35	2	2.58–2.62	2.62
11 " II "	3	2.09–2.35	2.20	2	2.47–2.66	2.56
12 " III "	3	1.14–1.33	1.20	2	1.38–1.40	1.39
13 " IV "	3	2.09–2.94	2.47	2	2.66–2.67	2.66
14 Pronotum length	3	2.83–3.36	3.15	2	3.60	3.60
15 " width	3	4.41–5.04	4.79	2	5.13–5.85	5.49
16 Scutellum length	3	2.16–2.56	2.40	2	2.66–2.75	2.70
17 " width	3	1.71–1.90	1.83	2	2.09	2.09
18 Hind tibia length	3	12.7–13.9	13.3	2	15.3–16.6	16.0
Tibial dilation:						
19 total width	3	4.46–4.82	4.68	1	5.76	5.76
external part:						
20 length	3	9.31–10.1	9.72	2	10.8–12.4	11.6
21 width	3	2.92–3.55	3.27	1	3.84	3.84
internal part:						
22 length	3	6.72–7.20	7.04	2	7.77–9.40	8.58
23 width	3	1.05–1.44	1.27	1	1.92	1.92
24 Undilated portion	3	2.73–2.97	2.86	2	3.26–3.84	3.55
Ratios: (figures refer to character numbers above).						
1 / 2	3	7.54–8.13:1	7.88:1	2	7.59–7.96:1	7.79:1
1 / 18	3	1.14–1.27:1	1.19:1	2	1.08–1.17:1	1.12:1
2 / 3	3	0.84–0.90:1	0.87:1	2	0.90–0.91:1	0.90:1
6 / 2	3	2.52–2.60:1	2.57:1	2	2.38–2.39:1	2.39:1
10 / 2	3	1.07–1.20:1	1.15:1	2	1.08–1.17:1	1.17:1
9 / 6	–	—	—	1	1.08	1.08:1
15 / 16	3	1.92–2.04:1	1.99:1	2	1.92–2.12:1	2.03:1
20 / 18 %	3	72.4–73.3	72.8	2	70.3–74.9	72.7
22 / 18 %	3	51.7–53.9	52.7	2	50.5–56.4	53.6

Table 20 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	15.0-18.0	16.8	5	18.2-19.5	18.9
2 Head length	5	2.05-2.37	2.13	5	2.28-2.47	2.33
3 " width	5	2.26-2.51	2.39	5	2.47-2.69	2.56
Distance:						
4 inter-ocular	5	1.17-1.33	1.24	5	1.29-1.40	1.35
5 ante-ocular	5	0.76-0.87	0.82	5	0.93-1.02	0.96
Antennae:						
6 segm. I length	5	4.56-5.76	5.11	5	4.99-5.42	5.28
7 " II "	5	4.70-6.09	5.54	5	5.61-6.33	6.01
8 " III "	4	3.93-4.60	4.24	5	4.41-4.89	4.57
9 " IV "	4	4.65-5.61	5.07	5	4.56-6.05	5.39
Labium:						
10 segm. I length	5	2.28-2.79	2.45	5	2.66-2.81	2.70
11 " II "	5	1.99-2.75	2.28	5	2.47-2.66	2.52
12 " III "	5	1.14-1.52	1.30	5	1.44-1.59	1.51
13 " IV "	5	2.26-3.23	2.68	5	2.66-3.07	2.82
14 Pronotum length	5	2.68-3.84	3.26	5	3.45-3.93	3.68
15 " width	5	4.46-5.47	5.09	4	5.85-6.29	6.04
16 Scutellum length	5	2.12-2.92	2.54	5	2.73-2.96	2.84
17 " width	5	1.57-2.18	1.95	5	2.09-2.31	2.19
18 Hind tibia length	4	11.2-16.2	13.4	5	14.1-16.3	15.5
Tibial dilation:						
19 total width	4	3.45-4.89	4.20	5	3.93-6.05	5.21
external part:						
20 length	4	8.64-12.4	10.3	5	10.9-13.4	12.2
21 width	4	2.44-3.02	2.74	5	2.49-4.08	3.36
internal part:						
22 length	4	6.48-8.64	7.33	5	7.92-9.84	9.02
23 width	4	0.80-1.53	1.16	5	1.20-1.92	1.69
24 Undilated portion	4	2.40-2.88	2.52	5	2.40-2.59	2.64
Ratios: (figures refer to character numbers above).						
1 / 2	5	7.31-8.42:1	7.90:1	5	7.67-8.55:1	8.12:1
1 / 18	4	1.11-1.33:1	1.18:1	5	1.16-1.38:1	1.21:1
2 / 3	5	0.84-0.94:1	0.89:1	5	0.88-0.92:1	0.91:1
6 / 2	5	2.22-2.66:1	2.39:1	5	2.10-2.37:1	2.26:1
10 / 2	5	1.09-1.26:1	1.15:1	5	1.08-1.23:1	1.15:1
9 / 6	4	0.97-1.11:1	0.99:1	5	0.86-1.13:1	1.02:1
15 / 16	5	1.95-2.11:1	2.00:1	4	2.02-2.20:1	2.12:1
20 / 18 %	4	75.9-78.1	72.7	5	77.5-82.3	78.9
22 / 18 %	4	53.3-57.4	51.7	5	56.1-61.1	58.0

Bitta hymeniphera (Westwood), 1840 comb.n

(Plate 23)

Anisoscelis hymenifera Westwood, 1840: 275, pl. 20, fig. 3.

Holotype ♀, Mexico (UM) [examined]

Anisoscelis hymenifera Westwood: Stål, 1870: 159.6; Distant, 1881: 123.3; Lethierry & Severin, 1894: p.45.

General and differential diagnosis: All segments of antenna yellow ochre to reddish brown, the Ist with a lateral brown patch; pronotum, scutellum and corium pale brown to reddish brown, with yellowish white markings; lateral margins of pronotum and collar yellow ochre; femur of all legs with basal band on anterior and posterior surfaces. Characteristic features of ♂♂: the shape and size of genital capsule and paramere; the shape and size of processes 19a-b, 8a-b, 20a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa. B. hymenifera shows close relationships with B. gradadia as indicated by sharing a brown band on antenniferous tubercles, comparatively narrow and long tibial dilation; long genital capsule, long process of ventral ridge of genital capsule, processes 16a-b of conjunctiva horizontal, presence of processes 20a-b, processes 8a-b comparatively long and more sclerotized, process 5a slender with distinct convolutions. B. gradadia can be distinguished from B. hymenifera by: brownish to dark brown colouration of antennae, black colouration on

posterior margin and usually on lateral margins of pronotum and calli, black scutellum, the presence of three dark brown to black bands on femora and two on fore and middle tibia.

Description: Head. Basically yellow ochre, with the whole dorsal surface darker; antenniferous tubercles with a lateral brown band. First three labial segments yellow ochre sometimes becoming darker distally, usually with the middle area of ventral surface brownish or brown; IVth antennal segment entirely brown or black. All segments of antenna dark yellow ochre to reddish brown, occasionally red; Ist segment with a brown patch on the external surface, gradually fading away distally and usually restricted to the basal half. Tylus flattened anteriorly, occasionally prominent, usually level with juga but occasionally below the latter. Labium not reaching beyond the IIIrd sternite. Thorax. Pronotum, scutellum and corium pale brown to reddish brown; lateral margins and collar yellow ochre; posterior margin of pronotum, lateral martins of scutellum, costal margin of corium, longitudinal and cross veins of corium and the boundary between corium and membrane yellowish white; very occasionally the yellowish white colouration on veins of corium is present simultaneously on all the veins; pleural and sternal areas yellow ochre. All legs yellow ochre to brownish, with the femora becoming darker distally. Trochanter of all legs with dark brown to black band on anterior and posterior surfaces. Femur of all legs with a band on the basal half of anterior and posterior surfaces. Posterior surface of tibial dilation basically yellow orange; the middle part reddish to dark red, with irregular yellow ochre patches, the latter with or without small

dark red spots; margin of internal dilation at its distal part occasionally black; anterior surface similar to the anterior one but with diffuse and less intense colouration. Pronotal calli slightly elevated; humeral angles porminent, obtuse to subacüte and raised; posterolateral margins entire; posterior margin straight or slightly concave. Hind tibia (fig. I) with concave foliaceous dilation, i.e. with raised margins; the external dilation extending over more than $\frac{3}{4}$ of the length of tibia, sinuous and emarginate. Abdomen. Tergites brownish, with the anterior margin of each yellow ochre; posterior half of Ist tergite brown; VIIth tergite with a pair of patches and a median longitudinal line yellow ochre; connexivum dark brown to black. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males yellow ochre to pale orange, sometimes tinged with red.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly medially depressed, above lateral margin; the latter sinuous, wide at the level of proctiger and narrowing posteriorly. Paramere (fig. C,D) - shaft expanded laterally near the outer lobe, forming a lateral carina (a); outer lobe not very conspicuous, pointed and deflected ventrally; shank slender, distally bent, with rounded tip. Phallus (fig. E) - phallotheca dorsally and laterally sclerotized; processes 14a-b moderately sclerotized, not very conspicuous, in lateral position, directed antero laterally; conjunctiva with elongate and bulging dorsal sac, terminating in a distal narrow and elongate distal lobe. Conjunctiva armed with the following processes: 16a-b horizontal, heavily sclerotized, spinose, slightly curved anteriorly; 18a-b membranous and thick; 19a-b

membranous, small and rounded; 9a-b membranous conspicuous and flat; 8a-b very conspicuous, heavily sclerotized, and with a large flat subacute tip; 20a-b membranous not very prominent; 5a (fig. E,F) slender with three distinct and complete convolutions.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H), slender, tubular, with bulging almost vertical base, spermathecal duct with basal convolutions.

Measurements and Ratios: (see table 21)

Geographical distribution: (Map 7) Only known from Mexico and Guatemala.

Habitat and Biology: Most of the data of the material studied are incomplete, and June as the month of collection is mentioned for only one of the specimens available for study. During the dissections, this specimen and another female without the date of collection, were found with developed eggs; the eggs are cupuliforms, length 1.97mm, width 1.14mm, height 1.14mm.

Material examined.

a) Type material: Holotype ♀ of Anisoscelis hymenifera from Mexico, labelled "Type Hem 347, Anisoscelis hymenifera Westwood, Hope Dept. Oxford, 610. W." in UM.

b) Other material: GUATEMALA: Jalapa, Hoege, 1 ♀ (IRSNB). MEXICO: Morelos, Cuernavaca, June, H.H. Smith, 1 ♀ (BMNH); 1 ♂, 1 ♀ (BMNH);

1 ♀ (BMNH); Oaxaca, 1 ♂ (BMNH); 1870, Sichel, 1 ♂ (NM); Cornuva, Billimek, 1 ♂ (NM); 2 ♀ (NM); Cuesta de Misantla, M. Trujillo, 1 ♀ (NM); M. Sallé, 1 ♂, 2 ♀ (NR); Boucard, 1 ♂ (NR); 1 ♂ (RNH); 2 ♀ (IZA); 1 ♀ (MNHN).

Plate 23

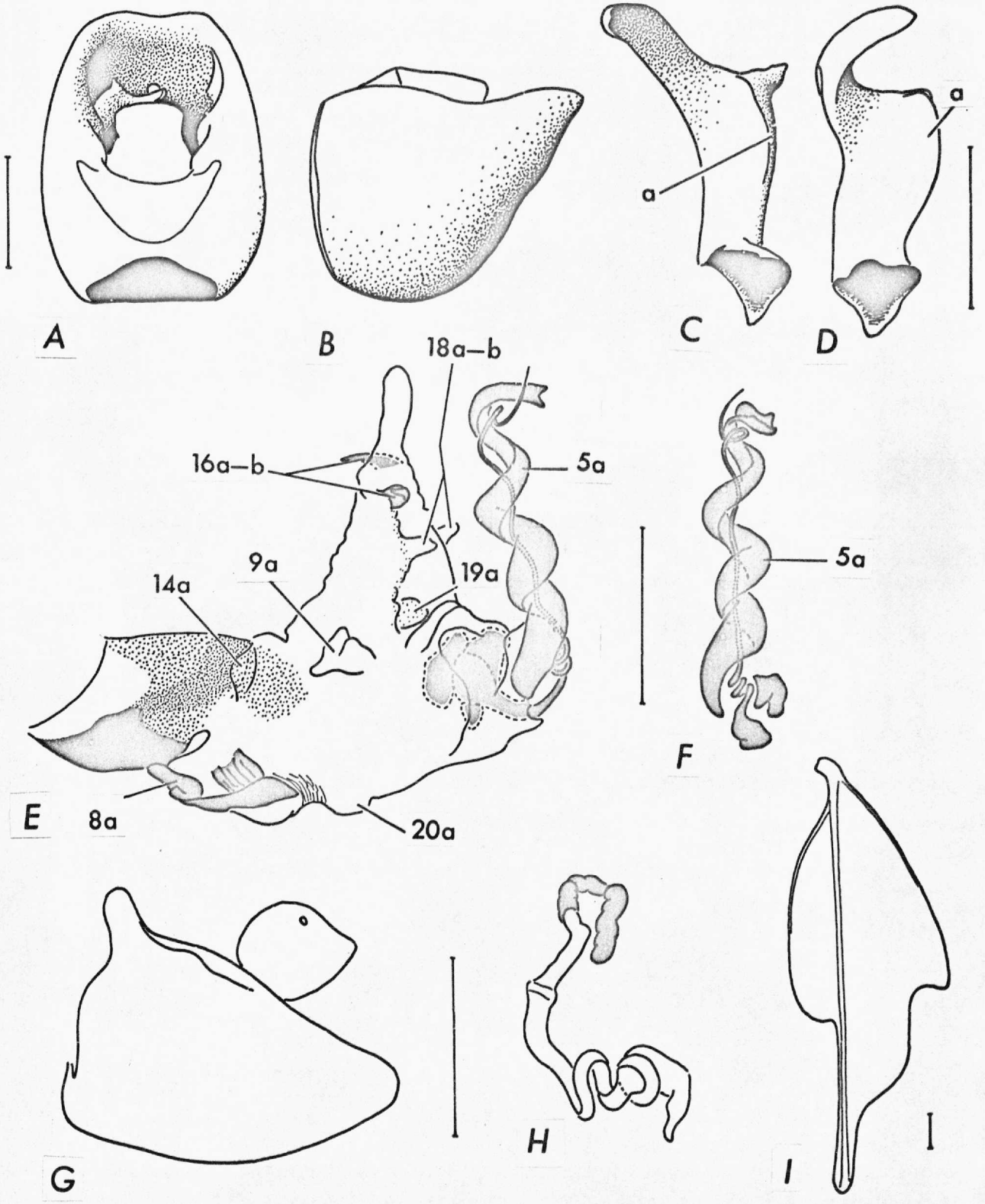


Table 21 Measurements (5 ♂♂ and 5 ♀♀ from 6 localities) in millimetres;

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.6-18.2	16.6	5	15.7-19.5	17.8
2 Head length	5	1.86-2.18	2.07	5	1.99-2.35	2.16
3 " width	5	2.10-2.29	2.20	5	1.99-2.43	2.28
Distance:						
4 inter-ocular	5	1.04-1.25	1.14	5	1.12-1.31	1.22
5 ante-ocular	5	0.74-0.85	0.80	5	0.81-0.95	0.89
Antennae:						
6 segm. I length	5	4.12-4.56	4.30	4	3.45-4.89	4.36
7 " II "	5	4.32-4.70	4.50	4	3.74-5.28	4.69
8 " III "	5	3.50-3.69	3.57	4	3.07-4.22	3.71
9 " IV "	2	3.88-4.22	4.05	4	3.64-4.32	4.04
Labium:						
10 segm. I length	5	2.09-2.45	2.22	5	2.05-2.39	2.26
11 " II "	5	1.84-2.14	1.96	5	1.90-2.22	2.12
12 " III "	5	1.25-1.36	1.29	5	1.15-1.52	1.32
13 " IV "	5	1.86-2.43	2.04	5	1.74-2.47	2.09
14 Pronotum length	5	3.12-3.60	3.22	5	2.97-3.84	3.47
15 " width	5	4.80-5.42	5.09	5	5.04-6.43	5.71
16 Scutellum length	4	2.18-2.56	2.32	5	2.28-2.98	2.56
17 " width	5	1.71-2.09	1.93	5	1.82-2.37	2.09
18 Hind tibia length	5	11.3-12.4	1.19	3	10.8-15.0	13.2
Tibial dilation:						
19 total width	5	3.36-4.36	3.90	3	3.36-5.23	4.30
external part:						
20 length	5	8.88-10.4	9.61	3	9.12-12.2	10.8
21 width	5	2.16-3.02	2.63	3	1.92-3.07	2.55
internal part:						
22 length	5	5.61-6.62	6.28	3	6.05-8.54	7.42
23 width	5	0.80-1.34	1.07	3	1.10-1.68	1.37
24 Undilated portion	5	1.44-1.92	1.44	3	1.44-2.16	1.92
Ratios: (figures refer to character numbers above).						
1 / 2	5	7.65-8.42:1	8.01:1	5	7.78-8.66:1	8.24:1
1 / 18	5	1.28-1.46:1	1.39:1	3	1.29-1.44:1	1.34:1
2 / 3	5	0.79-0.99:1	0.94:1	5	0.86-1.00:1	0.94:1
6 / 2	5	1.90-2.29:1	2.07:1	4	1.73-2.09:1	2.01:1
10 / 2	5	1.00-1.13:1	1.07:1	5	1.00-1.13:1	1.04:1
9 / 6	2	0.92-0.93:1	0.92:1	3	0.90-1.05:1	0.92:1
15 / 16	4	2.11-2.21:1	2.19:1	5	2.11-2.48:1	2.23:1
20 / 18 %	5	78.1-83.4	80.7	3	80.6-83.7	81.3
22 / 18 %	5	49.3-56.1	52.7	3	55.1-56.8	55.9

Bitta gradadia (Distant) 1881 comb.n

(Plate 24)

Anisoscelis gradadia Distant, 1881: 122.1, pl. 13, fig. 1,2.

LECTOTYPE ♂, Guatemala (BMNH), here designated [examined, dissected].

Anisoscelis gradadia Distant: Lethierry & Severin, 1894: 45;

Blöte, 1936: 27.

General and differential diagnosis: Head with a dark brown patch on dorsal surface of neck, extending to the eyes and ocelli; pronotum brown, scutellum black and corium dark brown, and all with yellowish white markings; humeral angles usually obtuse, very conspicuous. Characteristic features of ♂♂: the shape and size of genital capsule, particularly the medially depressed posterior margin; the shape and size of parameres; the shape and size of processes 19a-b, 8a-b, 20a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa. B. gradadia resemble B. hymenifera (see diagnosis of latter species).

Description: Head. Basically yellow ochre, with the whole dorsal surface darker and the following parts dark brown: a patch on the dorsal part of the neck, which extends to the posterior margin of the eye and to the ocelli; a patch on the lateral surface of antenniferous tubercles. First three labial segments yellow ochre becoming darker distally, with anterior median surface brownish or brown; IVth labial segment entirely

brownish to black. All segments of antenna brownish to dark brown; the Ist with yellow ochre band on anterior surface and a very narrow sometimes inconspicuous line on posterior surface, of the same colour; IInd and IIIrd segments with the base usually yellow ochre. Tylus curved, slightly or not prominent. Labium not reaching beyond the IIIrd sternite. Thorax. Pronotum brown, scutellum black, and corium dark brown, with: humeral angle of pronotum, and the area between them, lateral margins of calli, usually the lateral margins of pronotum and calli and usually the costal margin of corium, black; posterior margin of pronotum, a median longitudinal band and lateral margins of scutellum, as well as the costal margin of corium, longitudinal and cross veins, and the boundary between corium and membrane yellowish white; pleural and sternal areas yellow ochre. All legs yellow ochre: Trochanter of all legs with a narrow dark brown to black band on anterior and posterior surfaces. Femur of all legs with narrow dark brown to black bands along anterior, posterior and external surfaces; distal part of hind femur yellow ochre to yellow orange. Tibia of fore and middle legs with two dark brown to black bands extending along anterior and posterior surfaces; the anterior one thin and the posterior thick. Posterior surface of tibial dilation basically yellow orange, the part brownish orange to reddish dark brown with an irregular patch yellow orange, the latter with some small dark brown to black patches; margin of internal dilation at its distal portion dark brown to black, usually extended to most of the distal area and as a transverse band, across the main shaft of the tibia up to the margin of the external dilation; anterior surface similar to the posterior one but with less

intense colouration. Pronotal calli slightly elevated; humeral angle very conspicuous, obtuse occasionally subacute, elevated, usually laterally directed; postero lateral margin sinuous and entire; posterior margin of pronotum straight. Hind tibia (fig. I) with concave foliaceous dilation, i.e. with raised margins; the external dilation extending over more than $\frac{3}{4}$ of the length of tibia, sinuous and emarginate. Abdomen. Dorsal region brownish, with the anterior margin of each tergite yellow ochre; posterior half of Ist tergite brown; VIIth tergite with a pair of patches and a median longitudinal line yellow ochre; connexivum dark brown to black. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males yellow ochre to pale orange.

Male genitalia: Genital capsule (fig. A,B) - posterior margin moderately medially concave, below the level of lateral margins; the latter sinuous, concave in the middle, wide at the level of proctiger. Parameres (fig. C,D) - shaft with two carinas: one lateral very prominent extending to the outer lobe (a), the other medial to the first one, not very prominent (b), both with the longitudinal space between them depressed; outer lobe not very conspicuous, very pointed and deflected ventrally; shank slender and distally bent, with rounded tip. Phallus (fig. E) - phallotheca dorsally and laterally sclerotized; processes 14a-b moderately sclerotized, not very conspicuous, in lateral position and projecting antero laterally: conjunctiva with elongate and bulging dorsal sac, terminating in a distal narrow distal lobe. Conjunctiva armed with the following processes: 16a-b horizontal, heavily sclerotized, pointed and slightly curved anteriorly; 18a-b membranous and thick; 19a-b membranous,

not conspicuous; 9a-b membranous, conspicuous and flat; 8a-b very conspicuous, slender, heavily sclerotized, and with a large flat subacute tip; 20a-b membranous, narrow and prominent; 5a (fig. E,F) slender, with three distinct and complete convolutions and a large twisted tip.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H), slender, tubular, with curved bulging base, spermathecal duct strongly curved at base.

Measurements and Ratios: (see table 22)

Geographical distribution: (Map 6) Only known from Guatemala and Costa Rica in Central America.

Habitat and Biology: This species has been found at 1000 to 2000m of altitude; dates of collection are not given in most of the material available, except April and November for specimens from Costa Rica. During the dissections, developed eggs were found in two females from Costa Rica collected in April; the eggs are cupuliforms, length 2.18mm, width 1.27mm, height 1.36mm.

B. gradadia is reported to feed on Passiflora quadrangularis in Costa Rica. One male from Guatemala, Panima, was observed with an egg of Tachinid (Diptera), possibly Trichopoda pennipes Fabr. deposited on the lateral margin of pronotum.

Discussion: The most important variation observed in the examined material were as follow: One of the specimens of Distant's original material, labelled by him as "var. a" shows certain marked differences

from the rest of the material studied, i.e., all yellow ochre areas on head, ventral part of thorax including the coxae, ventral part of abdomen and all the veins of corium, are deeply tinged with reddish orange colouration; the brown colouration on dorsal brown patch on the neck is restricted to the posterior part behind the level of the eyes and around ocelli; the brown colouration of antennal segments is paler and on the Ist segment restricted to external and internal surfaces, on IInd and IIIrd segments to the distal half, and the IVth segment entirely brownish; the black colouration on pronotum restricted to the humeral angle, and is not present on the corium; the brown bands on fore and middle femora, does not reach the base, and are absent on the hind femur; the brown bands on tibia reduced. The basal part of spermatheca rather variable in shape, its most generalized form is shown in fig. H; in some cases the spermatheca has the basal curvatures tightly coiled and the duct joins the base dorsally; in the female specimen (var. a of Distant) the spermatheca is quite different, showing basal convolutions similar to those observed in B. hymenifera.

Material examined.

a) Type material: The original material of Anisoscelis gradadia Distant consist of four specimens, three of which, 1 ♂ and 2 ♀♀ represent the genuine syntypes on which Distant based the description of the species; the fourth specimen, a ♀ from Guatemala, Cerro Zunil 1200-1400m, was noted by the author in his description as variant and consequently is not considered as belonging to the type series (Art. 72b of the International Code of Zoological Nomenclature). The ♂ syntype

labelled "Guatemala, Panima, Champion" in BMNH collection was designated and labelled as lectotype; the other two syntypes both females in BMNH, labelled "Purula, Vera Paz, Champion, Distant Coll. 1911 - 383" and "Type, Senahu, Vera Paz, Champion" respectively are designated and labelled as paralectotypes. The latter has a circular "type" label of uncertain origin, its designation as the lectotype of Anisoscelis gradadia was never published, it is therefore considered here merely as a syntype of the same status in nomenclature as the other specimens of the type series.

b) Other material: COSTA RICA: 1921, P. Sarré, 1 ♂, 2 ♀ (MNHN), San José, 1 ♂ (MNHN); San Pedro, Monte de Oca, IX - 1935, H. Ballou, On Passiflora quadrangularis L., 1 ♀ (IZA); s.l., 12-13 - IV - 1935, s.c., s.h., 2 ♀ (IZA). GUATEMALA: Panzos, 1 ♀ (RNH); Cerro Zunil, 1200-1400m, Champion, (Var. a of Distant), 1 ♀ (BMNH); Pancina, Vera Paz, Champion, 1 ♀ (BMNH).

Plate 24

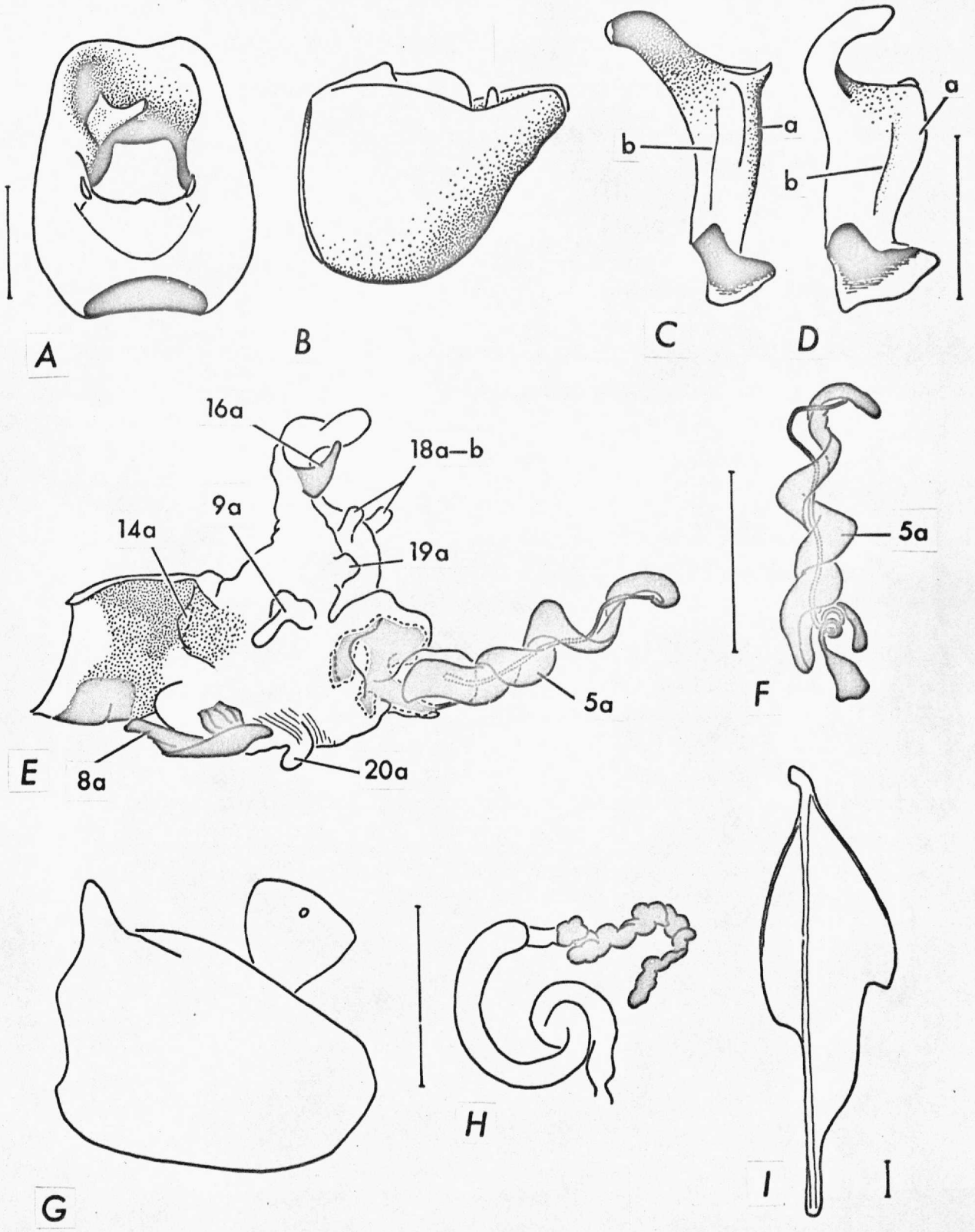


Table 22 Measurements (1 ♂ and 5 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	16.0	16.0	5	18.0-19.5	18.5
2 Head length	1	1.93	1.93	5	2.09-2.28	2.20
3 " width	1	2.26	2.26	5	2.33-2.52	2.40
Distance:						
4 inter-ocular	1	1.12	1.12	5	1.21-1.25	1.22
5 ante-ocular	1	0.76	0.76	5	0.66-0.89	0.80
Antennae:						
6 segm. I length	1	4.80	4.80	4	4.60-5.61	5.02
7 " II "	1	4.99	4.99	5	5.13-5.42	5.18
8 " III "	1	3.93	3.93	5	3.69-4.12	3.98
9 " IV "	1	4.41	4.41	2	4.46-4.80	4.63
Labium:						
10 segm. I length	1	1.99	1.99	5	2.28-2.41	2.34
11 " II "	1	2.10	2.10	5	2.18-2.28	2.25
12 " III "	1	1.27	1.27	4	1.21-1.42	1.31
13 " IV "	-	—	—	5	2.18-2.43	2.30
14 Pronotum length	1	2.73	2.73	5	3.55-3.60	3.51
15 " width	1	4.65	4.65	5	5.56-6.09	5.90
16 Scutellum length	1	2.18	2.18	5	2.60-2.92	2.69
17 " width	1	1.90	1.90	5	2.09-2.18	2.14
18 Hind tibia length	1	12.5	12.5	5	12.9-15.3	14.2
Tibial dilation:						
19 total width	1	3.84	3.84	2	4.22-4.70	4.46
external part:						
20 length	1	10.1	10.1	5	10.8-12.9	11.9
21 width	1	2.40	2.40	2	2.97-2.88	2.92
internal part:						
22 length	1	6.38	6.38	5	6.72-8.64	7.71
23 width	1	1.25	1.25	2	0.96-1.44	1.20
24 Undilated portion	-	1.92	1.92	5	1.92-1.63	1.77
Ratios: (figures refer to character numbers above).						
1 / 2	1	8.29:1	8.29:1	5	7.45-9.09:1	8.40:1
1 / 18	1	1.28:1	1.28:1	5	1.20-1.39:1	1.30:1
2 / 3	1	0.85:1	0.85:1	5	0.88-0.96:1	0.91:1
6 / 2	1	2.48:1	2.48:1	5	2.10-2.44:1	2.28:1
10 / 2	1	1.03:1	1.03:1	5	0.99-1.14:1	1.06:1
9 / 6	-	—	—	2	0.85-0.92:1	0.89:1
15 / 16	1	2.13:1	2.13:1	5	2.08-2.36:1	2.19:1
20 / 18 %	1	80.8	80.8	5	81.4-86.5	83.8
22 / 18 %	1	51.0	51.0	5	52.0-56.4	54.2

Diactor group of genera

DIACTOR Perty

(Plate 25)

Diactor Perty, 1830: 170, pl. 34, fig.1. Type-species: Diactor elegans Perty, 1830, by monotypy.

Diactor, Perty: Spinola, 1837: 199; Stál, 1867: 544; Distant, 1881: 360.

Diognosis: Large enlongate species. Head.- Basically dark yellow with metallic green areas on dorsal surface, first three segments of antenna metallic violaceous. Longer than wide, not declivent and long, not depressed behind ocelli, with tylus and juga slightly below the level of antenniferous tubercles; juga slender with rounded tips; Ist antennal segment long averaging 1.30-1.63 (1.56) times the length of head; segments II to IV cylindrical thin and long. Thorax. Basically dark yellow with metallic green colouration on pronotum, scutellum and pleural region. Pronotum slightly declivent and punctated, with not very prominent median longitudinal carina; calli separated by punctated area and elevated anteriorly, with sculpture different from the disk; lateral margins straight, at the level of calli with small tubercles projecting anteriorly on each side of the collar; humeral areas below the postero median area of disk of pronotum; posterior margin not depressed;

scutellum short sometimes wider than long, with rounded tip and marginal ridges near the apex; apex of femora ending in a pair of spines and usually with a row of widely separated spines, in line with the anterior apical spine; hind tibia (fig. I) with external and internal dilation, both sinuate and undulated, the external dilation longer but narrower than the internal one. Corium dark brown sometimes with difuse metallic green colouration. Abdomen.- Dorsal region metallic green, sternites, dark yellow with metallic green patches.

Male genitalia: Genital capsule (fig.A,B) - without subproctigeral sac, slender and tapering posteriorly, ventral ridge "U" shaped. Paramere - (fig. C,D), slender, somewhat twisted in the middle, without outer lobe and differentiated shank, distal half curved dorsally, flat and wide, with a lateral apical process. Phallus (fig. E,J.K.L): phallotheca without processes 14 a-b; dorsal sac of conjunctiva very elongate; processes 9 a-b slender, swollen and bend anteriorly; processes 8 a-b with basal lateral process or spur.

Female genitalia: Spermatheca (fig. H) with duct dilation; spermathecal bulb capitate.

Sculpture: Pleural region with both shiny and dull areas, the former on supracoxal lobes and post epimeral flange II and III.

Pubescence. Body comparatively bare with some very thin short hairs on coxae and on sternites which becomes more dense and longer on genital segments.

KEY TO SPECIES

1 Tibial dilation with six comparitively small distinct dark yellow to orange spots; processes 8 a-b and 16 a-b as in fig. E ..... bilineatus (p.227)

- Tibial dilation with seven large difuse dark yellow to orange spots; processes 8 a-b and 16 a-b as in fig. J and K respectively ..... bogotanus (p.239)

Diactor bilineatus (Fabricius),1803

(Plate 25)

Lygaeus bilineatus Fabricius. 1803: 213. 40. Holotype ♂, Brasil (UZM), locality here restricted [examined]

Diactor elegans Perty, 1830: 170, pl.34. fig. 1. Brasil, (lost). [Synonymized by Burmeister, 1835: 333.6.].

Anisoscelis latifolia Serville. 1831, pl. 18 (lost). [Synonymized by Burmeister, 1835: 333.6.].

Anisoscelis bilineata (Fabricius): Burmeister 1835: 333.6; Herrich-Schaeffer, 1835: 60, fig. 274.

Diactor bilineatus (Fabricius): Amyot & Serville, 843: 218.1; Dallas, 1857: 450.1; Stål 1868: 51.1; 1870: 160.1;

Walker, 1871: 123.1; Lethierry & Severin, 1894: 45; Blöte, 1936: 27.

Differential diagnosis: Head.- Dark yellow bands extending posteriorly from lateral margins of juga and inner half of antenniferous tubercles; median metallic green band without dark yellow patch on frons. Thorax. Pleural region always with distinct metallic green spots; prosternum with central black spot. Anterior and posterior surfaces of tibial dilation shiny dark brown with six distinct dark yellow to orange spots. Abdomen. Metallic green bands on sternites broad and always present.

Male genitalia: Genital capsule with the inflected portion of lateral margin almost straight at the level of proctiger. Paramere comparatively short, without basal dorsal depression, comparatively narrow distally, with dorsal curvature rather closely curved and the distal process distinctly dorsally directed. Phallus: with processes 18 a-b ending in acutely pointed straight tip, processes 9 a-b ending in a comparatively short stout but pointed tip; processes 8 a-b basally with a lateral obtuse to sub-acute projection.

Description: Head. Basically dark yellow with the dorsal surface metallic green except for two dark yellow bands usually extending posteriorly from lateral margins of juga and inner half of antenniferous tubercles, running

between eye and ocelli up to the collar of pronotum and continuing posteriorly over pronotum and scutellum. All segments of labium with metallic green colouration, which becomes less intense and difuse distally; basic colouration of distal segments dark brown to black. First three antennal segments metallic violaceous, the Ist segment and sometimes the IInd with the anterior surfaces dark yellow; IVth segment black. Tylus above juga very prominent antero dorsally; juga with lateral margins curved, converging anteriorly and with convex median margin. Labium not reaching beyond posterior margin of Vth sternite. Thorax. Basically dark yellow; pronotum almost entirely metallic green except for two dark yellow bands on both sides of the middle line, extending from anterior margin of collar to the posterior margin of pronotum. The rest of thorax usually with the following metallic green markings: On propleural region - the area inferior and close to lateral margins of pronotum extending from the collar to humeral angles; dorso lateral portion of the former; pleura and supracoxal lobes. On mesopleura - an inverted "V" shaped patch. On metapleura - an oblique patch extending dorsally from the supracoxal lobe. Scutellum metallic green except for the two dark yellow bands on its lateral margins. Mesonotum, metanotum and post alar bridge III metallic green. Black patches are usually present on sternal area as follow: On prosternum - a small oval central patch; On mesosternum - a wide patch extending from anterior

margin. All legs basically yellow ochre, with dark brown to black patches, which might or might not have the following metallic green colouration: On fore and middle legs - external surface of coxa; a patch on distal half of femur which extends basally over external and internal surfaces; a difuse band on posterior surface of tibia. On hind leg - external surface and partially the anterior and posterior surfaces of coxa; a patch on the external surface of the distal $\frac{1}{4}$th of the femur extending proximally as a difuse brownish band. Anterior and posterior surfaces of tibial dilation usually shiny dark brown with six distinct dark yellow to orange spots namely: three on external dilation i.e. one proximal, one distal, and one usually irregular in the middle, and those on internal dilation, i.e. one proximal, one marginal and one small median patch consisting of three or four very small spots; distal part of tibia dark yellow to orange. Fore wing dull brown on corium and membrane, the former might have some irregular metallic green colouration at base and on part of embolium. Pronotal calli moderately elevated with the antero median part above the level of the lateral areas; humeral angles somewhat curved or subobtuse, horizontal and below the level of humeral areas; postero lateral margins sinuous and entire; posterior margin straight. Hind tibia (fig.I) with a very wide, concave foliaceous dilation; both anterior and posterior dilations with leaf like veins running trans-

versally from the main shaft of tibia.

Abdomen.- Tergites and connexivum metallic green; margins of connexivum of each segment black, forming a longitudinal black band, narrow anteriorly and gradually wider posteriorly and extending over most of connexivum of VI segment. Sternites dark yellow, usually with metallic green bands on posterior margin of sternites II to VI, and on postero-dorsal corner of sternite VII and with black bands on anterior margin of sternites III to VI; genital segments of females and genital capsule in males, black, the lateral surface of the latter usually with a dark yellow patch.

Male genitalia: Genital capsule (fig. A,B) - posterior margin short, below the level of lateral margins; the latter somewhat sinuous, gradually descending posteriorly towards posterior margin; inflected part of lateral margin with one teeth at the level of the apex of the proctiger. Phallus: (fig. E) phallotheca dorsally and laterally slightly sclerotized; dorsal sac of conjuctiva very long, deflected anteriorly at the apex; conjunctiva armed with the following processes: 16 a-b heavily sclerotized and slender; 9 a-b membranous, elongate and swollen, very conspicuous, bent anteriorly, with the whole apex of the process heavily sclerotized; processes 8 a-b very conspicuous anteriorly very prominent, terminating in a spinose long tip, with a

lateral obtuse to subacute projection at base; processes 5a (fig. E,F) with only two wide convolutions.

Female genitalia: Ist gonocoxa and VIII laterotergite as shown in fig.G; spermatheca (fig. H) with duct dilation.

Measurements and Ratios: (see table 23)

Geographical distribution: (Map 8) The range of distribution of this species is very wide, extending from Mexico (only one specimen of doubtful locality) to the northern part of Argentina (2 observations from one locality), but it seems to be most common in the central and northern part of South America. The material available was collected in: Mexico, Panama, Colombia, Venezuela, Trinidad, French Guiana, Ecuador, Brasil, Bolivia and Argentina.

Habitat and Biology: Collection data indicate that this species ocurrs in rain forest zone and in Venezuela it has been collected in Tropical moist forest at 100 and 200 m altitude. The actual dates of collection have been recorded for only some available specimens and these were collected in March, April, October and November. During dissection the developed eggs were found in two females both without dates of collection, one from Brasil Rio de Janeiro and the other with no data at all; the eggs are large cupuliform, with sharp corners, length 2.85 mm, width 1.52 mm, height 1.38 mm.

D.bilineatus has been reported by Da Costa Lima as occuring on Passiflora quadrangularis.

One female from unknown locality was observed with two eggs of Tachinid (Diptera), possibly Trichopoda pennipes Fabr., one deposited on mesonotum, and the other between IIIrd and IVth tergite.

Discussion: The most important variation observed were as follows: One specimen of unknown locality has the first three segments of antenna brownish with some difuse violaceous colouration; four specimens from Brasil had part or the whole of pronotum metallic green and also some metallic blue colouration on the distal parts of femora.

D.bilineatus is closely related to D.bogotanus Stål (1870); the description of the latter was based on two males from Colombia, Bogotá and separated from D. bilineatus only by different colour pattern. The examination of only 5 specimens of bogotanus, in spite of limited material showed great individual variation in colour. The same variation in colour pattern occurs also in D.bilineatus, including the metallic blue colouration of pronotum; in fact the lectotype of bogotanus has the pronotum almost entirely metallic blue and the paralectotype has a difuse patch of the same colour in the middle of pronotum. Examination of genitalia of male and female of both species showed only minor differences between them (figs. J,K,L), which do not appear

to be sufficient for specific differentiation; the similarity of important characters of genitalia which include: shape and size of genital capsule, parameres, phallus; process 5 a and shape of spermatheca, would suggest that these two forms are conspecific. At present recognized temporally as separate species until studies of more representative material of both species are carried out.

Material examined.

a) Type material: Holotype ♂ of Lygaeus bilineatus Fabricius from Brasil, Rio de Janeiro (type locality here restricted), labelled "typus, Amer. merid. Schmidl, Mus. Dom. Lund. Lygaeus bilineatus Fabr. "in UZM Copenhagen Coll.. The type locality originally quoted as "America meridionalis" is here restricted to Brasil, Rio de Janeiro, where this species occurs and most of the specimens of known location were collected.

b) Other Material: ANTILLAS: Trinidad, 1914, P.Serre, 6 ♂, 3 ♀ (MNHN). ARGENTINA: Zenta, Jujuy, R.V. Skerl. 2 ♂(NM). BOLIVIA: Santa Cruz, Steinbach, 3 ♂, 1 ♀ ,(ZI). BRASIL: Rio de Janeiro, 1 ♂(ZSBS); 5 ♀ (ZSBS); Rio de Janeiro, 8-X-1917, R. Fischer, 1 ♀(DEI);2 ♂, 2 ♀ (ZIU); Berker, 1 ♂ (ZIU); Maki, 1 ♀ (ZMU); 1 ♂, 2 ♀ (ZI); Sao Paulo, Piracicaba, Bondar, 2 ♂, 2 ♀ (ZI); Cordocado, Rio D.F., - IV-1948, Wigodzinsky, 1 ♀ (NMP); Sao Paulo, 1 ♀ (TM); Signoret, 2 ♀ (NM);

Schott, 1 ♀ (NM); 2 ♀ (NM); Rio de Janeiro, "Novara Exp.", 2 ♂, 2 ♀ (NM); Rio de Janeiro, 1 ♂, 1 ♀ (NM); Amazonas, Toperinha, Santarem, - III - 1916, G. Hagmann, 4 ♀ (NM) 1899, R. Oberthür, 1 ♀ (MNHN); 1930, Sicard, 1 ♀ (MNHN); 1853, M. Fontanier, 1 ♂ (MNHN); Rio Janeiro, 1909, Dupuy 1 ♂, 5 ♀ (MNHN); André. 1 ♀ (MNHN); Sta Catherine, 1 ♂ (IZA); 1914, S. Marquiste, 1 ♀ (MNHN); 5 ♀ (MNHN); Rio de Janeiro, 1 ♀ (MNHU); Santos, H. Schmiedeberg V., 1 ♂ (MNHU); 14-IV-1924, Nictheory, 1 ♂ (MNHU); 1919, (MNHN); 1 ♂, 1 ♀ (MNHN); 1895, G. Fallou, 1 ♂, 1 ♀ (MNHN); Lacerda, 1 ♂, 3 ♀ (IRSNB); Bahia, s.c., 1 ♂, 1 ♀ (IRSNB); s.d., 1 ♂ (ZIU); Rio de Janeiro, 1 ♀ (IRSNB); Botafogo, 1 ♀ (IRSNB); Rio de Janeiro, Beschke, 1 ♂ (RNH); Manicoro, Rio Madeira, - XII - 1923, E. le Moult, 2 ♂, 2 ♀ (RNH); 2 ♀ (UZM); 12-IX-1914, 1 ♀ (UZM); Rio de Janeiro, Reinhardt 2 ♂, 2 ♀ (UZM); s.l., 1949, Carvalho, 1 ♀ (UZM); 1 ♂, 1 ♀ (NR); Minas Geraes, Schyvale, 1 ♀ (NR); Santos, - I - 1903, 1 ♂ (NR); Bilbao, 1 ♂ (NR); Amazonas, Fontoboa, 1 ♂ (NR); Amazonas, Manaos, Roman, 1 ♀ (NR); Amazonas sup. 2 ♂ (NR); Hardwicke, 1 ♂, 2 ♀ (BMNH); Rio de Janeiro, 1 ♀ (BMNH); s.l., A.M. Moss, 1 ♀ (BMNH); s.l., 1 ♂ (IZA); 3 ♂ (BMNH); 1 ♂ (UZM); 1 ♂ (MLP); 1 ♀ (RNH); Manaos, 1 ♀ (BMNH); Marcoja Santos, 1 ♀ (RNH); Sta Catarina, 1 ♂ (IZA). COLOMBIA: 1 ♂ (ZSBS). ECUADOR: Esmeraldas, San Mateo, 18-V-1956, J. Forster, 1 ♀ (ZSBS).

FRENCH GUIANA: 1899, R. Oberthür. 1 ♂, 1 ♂, (MNHN). MEXICO: Guadalupe, 1883, Bilimek, 1 ♀ (NM). PANAMA: Chiriquí, 1 ♂,

HNHM). PERU: Iquitos, S. Rogue, E. le Moult. 1 ♂ (RNH); Jumbatis, Rio Huallaga, 350 mts, 1937, G.Klug, 1933, Nagel, 1 ♂, 1 ♀ (DEI); San Antonio, Rio Huallaga, 350 mts, s.c., 1 ♀ (DEI); Juanyui, Rio Hualluga, -IX-1935, s.c. 1 ♂ (DEI). VENEZUELA: Terr. Federal Amazonas, Yavita, Rio Atabapo, 2-V-1953, J.A. Guzman, 1 ♂ (IZA).

c) Material without data: 1 ♂, 2 ♀, labelled, "Breddin Coll." (DEI); 2 ♂, (MNHU); 1 ♀ (IRSNB); 1 ♂ 1 ♀, labelled "Cat. No. 2,3," (RNH); 1 ♀, labelled "America" (RNH); 1 ♂ 5 ♀, labelled, "Coll. Henning", (ZMU); 1 ♀, (ZMU); 1 ♂ (NMP); 1 ♂, 1 ♀, labelled "No. 43, No. 283/106, (TM); 1 ♂, 1 ♀, (NM); 1 ♂ (MNHN); 1 ♂, labelled "Fry Coll.," (BMNH); 1 ♀, labelled "D.bilineatus det. W.E. China. 1939 (BMNH); 1 ♀, labelled "Yunnan, Coll. Le Moult" (RNH); 1 ♂, labelled "337 K" (BMNH); 1 ♀, labelled "574, Fry Coll.(BMNH); 1 ♀, labelled "Miles Moss Coll. BM 1947-453 (BMNH).

Plate 25

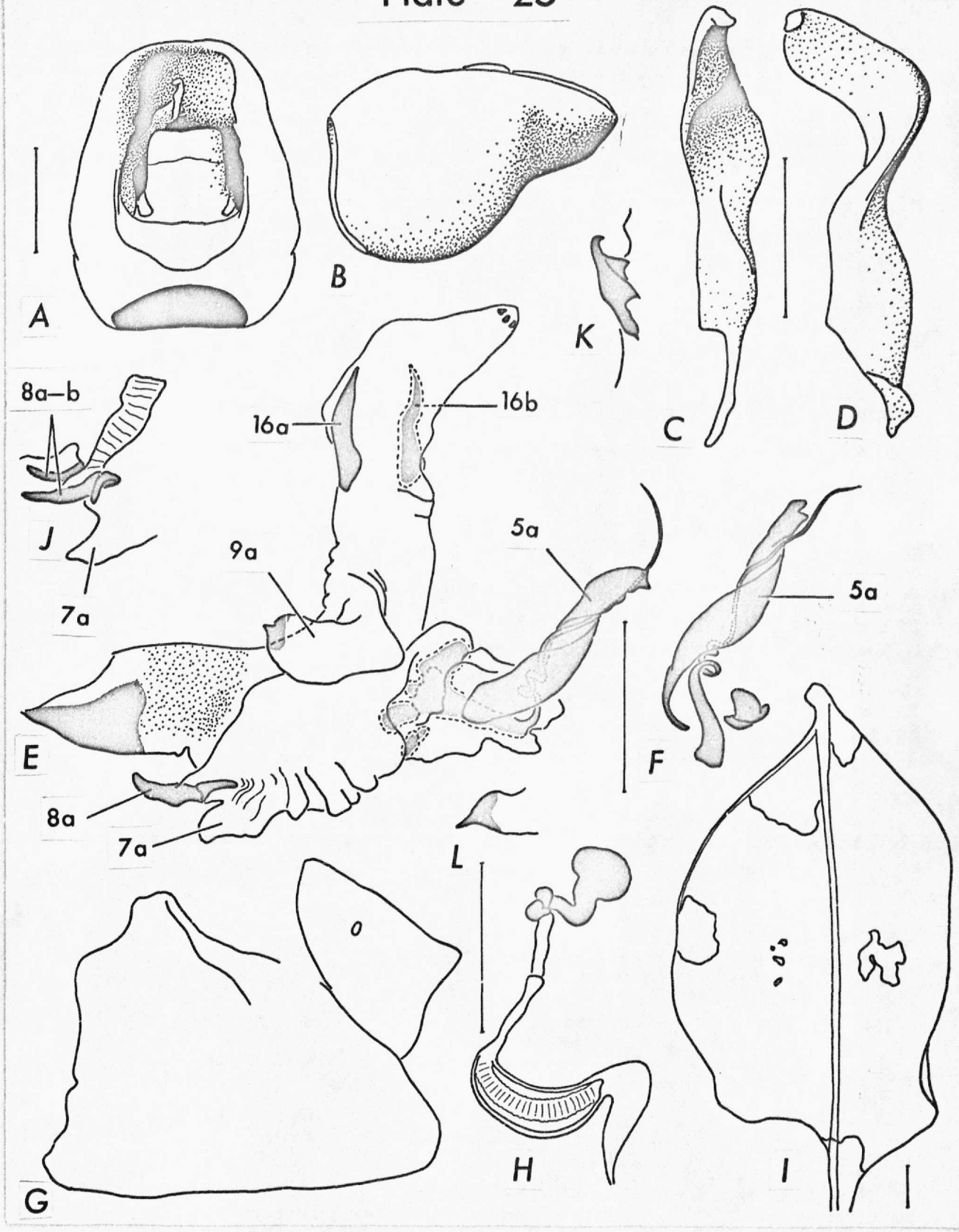


Table 23 Measurements (5 ♂♂ and 4 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	19.5–22.0	20.6	4	21.0–23.0	22.1
2 Head length	5	2.85–3.04	2.93	4	3.04–3.13	3.03
3 " width	5	2.52–2.67	2.63	4	2.58–2.83	2.67
Distance:						
4 inte-ocular	5	1.15–1.38	1.26	4	1.21–1.33	1.27
5 ante-ocular	5	1.23–1.46	1.35	4	1.38–1.48	1.42
Antennae:						
6 segm. I length	5	4.32–4.70	4.60	4	4.08–4.65	4.42
7 " II "	5	5.76–6.24	5.99	4	5.42–6.33	5.76
8 " III "	5	5.28–5.76	5.41	4	5.04–5.85	5.44
9 " IV "	5	6.86–8.06	7.37	2	5.90–6.62	6.26
Labium:						
10 segm. I length	5	3.23–3.76	3.48	4	3.32–3.80	3.63
11 " II "	5	3.28–3.57	3.44	4	3.51–3.99	3.68
12 " III "	5	1.76–1.90	1.81	4	1.71–1.90	1.82
13 " IV "	5	3.57–3.85	3.74	4	3.61–4.37	3.83
14 Pronotum length	5	3.93–4.32	4.23	4	4.03–4.84	4.31
15 " width	5	4.32–5.08	4.75	3	5.04 5.85	5.42
16 Scutellum length	5	1.90–2.14	2.07	4	2.01–2.47	2.22
17 " width	5	2.09–2.28	2.23	4	2.09–2.66	2.34
18 Hind tibia length	5	16.4–18.5	17.1	4	16.1–19.2	17.1
Tibial dilation:						
19 total width	4	6.24–9.12	7.44	3	6.24–8.16	7.42
external part:						
20 length	4	12.9–14.8	13.8	3	12.4–15.8	13.8
21 width	4	2.73–4.80	3.39	3	2.27–3.40	3.01
internal part:						
22 length	4	10.3–11.5	10.8	4	10.0–12.9	10.9
23 width	4	3.12–4.03	3.67	3	3.36–4.36	4.01
24 Undilated portion	5	2.88–3.02	2.90	3	2.88–3.36	3.08
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.80–7.23:1	7.03:1	4	6.86–8.07:1	7.29:1
1 / 18	5	1.16–1.25:1	1.20:1	4	1.19–1.42:1	1.29:1
2 / 3	5	1.07–1.14:1	1.11:1	4	1.05–1.21:1	1.13:1
6 / 2	5	1.46–1.61:1	1.56:1	4	1.30–1.56:1	1.45:1
10 / 2	5	1.12–1.26:1	1.18:1	4	1.06–1.26:1	1.19:1
9 / 6	4	1.47–1.67:1	1.60:1	2	1.32–1.62:1	1.46:1
15 / 16	5	2.16–2.37:1	2.29:1	3	2.31–2.39:1	2.36:1
20 / 18 %	4	78.6–81.3	80.7	3	77.0–82.2	80.7
22 / 18 %	4	62.1–63.8	63.1	4	60.6–61.1	62.1

Diactor bogotanus Stál 1870

(Plate 25)

Diactor bogotanus Stal, 1870: 160.2. LECTOTYPE ♂ and 1 ♂ Paralectotype, Colombia (NR), here designated [examined, dissected].

Diactor bogotanus Stål: Distant, 1881: 360.1, p.33, fig. 8; Lethierry & Severin.,1894: 46.

Differential diagnosis: Head. Dark yellow bands on dorsal surface wider, extending over most of juga and antenniferous tubercles and slightly in front and on the back of the eye; median metallic green band usually with a dark yellow irregular patch on central part of frons. Thorax. Pleural area with the metallic green colouration reduced to various degrees, it might be totally absent (Lectotype ♂), reduced to a small patch on the supracoxal lobes, (2 ♂ from Colombia, 1 ♀ from Brasil, Sta Catarina), or show a pattern similar to bilineatus but with the patches reduced in size (1 ♀ from Panama, Bugaba); prosternum without central black patch. Anterior and posterior surfaces of tibial dilation variable: 3 ♂ from Colombia have the dilation redish brown, becoming darker distally, with seven wide, difuse redish orange spots; four on the external dilation as follow: one proximal, one medial irregular or fractionate, one marginal and the fourth one distal; the pattern of spots on internal dilation as in

bilineatus. 2 ♀, one from Panama, Bugaba and the other from Brasil, Sta. Catarina have the basic colouration of the dilation similar to bilineatus, but with the same seven patches described above. Abdomen. Sternites with the metallic green colouration reduced in various degrees, it might be restricted to a narrow occasionally short band on posterior margin of sternites II to VI.

Male genitalia: Genital capsule with the inflected portion of lateral margins markely sinuate at the level of proctiger. Paramere comparitively large, with a basal dorsal depression, comparatively wider distally with dorsal curvature more open and more laterally directed distal process. Phallus with processes 16 a-b (fig.K) ending in a hook like tip, processes 9 a-b (fig. L) ending in a more long spinose tip, processes 8 a-b (fig.J) basally with lateral spur like projection.

Female genitalia: spermatheca with a comparatively long duct dilation.

Description: As for D. bilineatus except differential characters.

Measurements and Ratios: (see table 24)

Geographical distribution: (Map 8) Due to the shortage of material, it is not possible to know the actual distributional range of this subspecies, the material studied was

collected in Colombia, Panama and Brasil, Sta Catarina.

Material examined.

a) Type material: Diactor bogotanus Stal, 2 ♂♂ syntypes, both labelled "Bogota, Lindig" in NR collection and in the course of this study, the one bearing a red rectangular "typus" label was designated as lectotype, and the other with a "paratypus" label as paralectotype.

b) Other material: BRASIL: Sta. Catarina, 1 ♀ (NR). COLOMBIA: 1 ♂ (IZA). PANAMA: Bugaba, Champion (sp. figured in Distant 1881, pl. 33, fig. 8), 1 ♀ (BMNH).

Table 24 Measurements (3 ♂♂ and 2 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	18.5-20.3	19.6	1	20.2	20.2
2 Head length	3	2.85-2.88	2.86	2	3.04-3.23	3.13
3 " width	3	2.49-2.56	2.53	2	2.58-2.67	2.62
Distance:						
4 inter-ocular	3	1.19-1.31	1.24	2	1.31-1.42	1.36
5 ante-ocular	3	1.42	1.42	2	1.42-1.55	1.48
Antennae:						
6 segm. I length	2	4.56-4.70	4.63	2	4.41-4.80	4.60
7 " II "	2	6.24-6.43	6.33	2	6.00-6.48	6.24
8 " III "	2	5.76-6.43	6.09	2	5.95-6.05	6.00
9 " IV "	-	---	--	1	7.77	7.77
Labium:						
10 segm. I length	3	3.42-3.61	3.52	2	3.51-3.99	3.75
11 " II "	3	3.45-3.61	3.55	2	3.80-4.18	3.99
12 " III "	2	1.99-2.90	2.44	2	1.90-2.09	1.99
13 " IV "	2	4.02-4.08	4.05	2	4.18-4.37	4.27
14 Pronotum length	3	3.84-4.03	3.95	2	3.69-5.52	4.60
15 " width	3	4.60-4.84	4.69	2	4.46-4.51	4.48
16 Scutellum length	3	1.90-1.99	1.95	2	1.99-2.28	2.13
17 " width	3	1.99-2.09	2.05	2	1.99-2.28	2.13
18 Hind tibia length	2	17.0-18.4	17.7	2	17.7-19.0	17.8
Tibial dilation:						
19 total width	3	5.76-7.20	6.44	2	6.62-8.78	7.70
external part:						
20 length	3	12.4-14.1	13.0	2	12.9-14.4	13.6
21 width	3	2.40-3.84	3.20	2	2.73-3.84	3.28
internal part:						
22 length	3	10.3-10.7	10.4	2	10.5-11.6	11.0
23 width	3	2.40-3.36	2.96	2	3.45-4.51	3.98
24 Undilated portion	2	3.60-3.64	3.62	2	3.36-4.32	3.84
Ratios: (figures refer to character numbers above).						
1 / 2	3	6.49-7.04:1	6.85:1	1	6.64:1	6.64:1
1 / 18	2	1.00-1.19:1	1.10:1	1	1.14:1	1.14:1
2 / 3	3	1.11-1.14:1	1.13:1	2	1.17-1.20:1	1.19:1
6 / 2	2	1.60-1.63:1	1.61:1	2	1.45-1.48:1	1.46:1
10 / 2	3	1.20-1.26:1	1.23:1	2	1.15-1.23:1	1.19:1
9 / 6	-	---	--	1	1.76:1	1.76:1
15 / 16	3	2.33-2.45:1	2.40:1	2	1.97-2.24:1	2.10:1
20 / 18 %	3	73.5-76.6	75.1	2	72.8-75.7	74.3
22 / 18 %	3	58.1-60.5	59.3	2	59.3-61.0	60.1

Leptoglossus group of genera

Diagnosis: Head. Usually black with two or three longitudinal stripes, occasionally unicolourous; usually not declivent and longer than wide, sometimes porrect; antennal segments always cylindrical. Thorax. Posterior margin of pronotum without pronotal extensions; hind tibia (fig.I) with tibial dilation usually foliaceous, occasionally lanceolate small or almost obsolete. Fore wing always in condition of tipical hemelytra.

Male genitalia:- Genital capsule (figs. A,B) - without subproctigeral sac; posterior margin usually with median notch of various shapes; lateral margins entire sometimes flared. Parameres (figs. C,D) - shaft usually compressed laterally, not twisted, sometimes with distal cavity; shank not flat, with conspicuous hook, occasionally with median lobe; outer lobe present. Phallus (fig.E) phallotheca usually laterally sclerotized; processes 14 a-b absent, dorsal fold present; processes 9 a-b present and, with few exceptions, sclerotized and very conspicuous; processes 1, 2 a-b, 3 a-b, 4 a-b sometimes present; process 5a (figs. E,F) with only two convolutions.

Female genitalia: Spermatheca either entirely tubular, or with duct dilation; spermathecal bulb always capitate occasionally with projecting extremities.

Eggs: Subcylindricals with one side flat, operculum circular placed close to one of the extremities.

KEY TO GENERA

1 Hind tibia with lanceolate tibial dilation ..... (occurring in Neotropical region) 2

\- Hind tibia usually with foliaceous tibial dilation, occasionally elongate with emarginations or lanceolate (occuring in Australian region)..... 5

2 (1) Pleural region with 6 rounded well defined and contrasting yellowish white spots near the supracoxal lobes or with longitudinal yellowish white bands 3

\- Pleural region with different colour pattern from above 4

3 (2) Pleural region with rounded yellowish spots; a yellowish white spot on the last tergite; paramere with outer lobe; processes 12 a-b and 13 a-b of conjunctiva present; spermatheca long and entirely tubular. (Plates 26-29) .... STALIFERA (p.248)

\- Pleural region with yellowish white bands; paramere without outer lobe; processes 12 a-b and 13a-b absent; spermatheca with conspicuous prominent

base and narrow short duct (plates 32-34).....
.....-THEOGNIS (p.292)

4 (2) Long and robust species; pleural region reddish brown with some small black spots here and there; narrow yellow band extending from Ist to VIIth tergite; humeral areas of pronotum usually strongly expanded laterally, if not the pronotum coarsely punctated, almost rugulose; margin of the bottom of the median notch of genital capsule usually swollen or with median projection; if not the hook of paramere strongly curved medially; paramere without dorsal longitudinal, shallow and narrow depression (plated 43-47) .....
.....LEPTOGLOSSUS (p.377)

- Species of small to medium size; pleural region black or dark brown with black patches; tergites without narrow median longitudinal band; humeral areas of pronotum not expanded laterally; median notch of genital capsule with the bottom uniform not swollen and without the median projection; paramere with a dorsal, shallow and narrow, longitudinal depression (a)(plates 30-31).....NARNIA (p.276)

5 (1) Pronotum with transverse arcuate narrow coloured band extending from one lateral margin to the other; sternites brown to black, with several large yellow ochre to reddish orange patches over the whole of the ventral surface; paramere without outer lobe; dorsal sac of conjunctiva very long and tapering distally (plate 35); spermatheca as illustrated plate 35, fig. H. ..... FABRICTILIS (p.309)

\- Pronotum and sternites with colour pattern different from above; paramere with outer lobe; dorsal sac of conjunctiva not as illustrated on plate 35. 6

6 (5) Pronotum usually with four yellow ochre to orange patches, of various shapes, or with large orange patches on humeral areas and declivous part of pronotum; sternites yellow ochre to reddish orange or orange, with well defined black patches; dorsal sac of conjunctiva without sclerotized processes; processes 11 a-b present, and processes 4 a-b and 6 absent ----- ..... MICROPHYLLIA (p.334)

\- Pronotum usually reddish brown, with two oval yelowish patches on anterior area, occasionally with a wide yellowish patch over the whole

declivous part; sternites normally with scattered small black spots; dorsal sac of conjunctiva with sclerotized processes; processes 11 a-b absent; processes 4 a-b and 6 present. .. .. VENEZA (p.411)

STALIFERA gen.n

(Plates 26-29)

Type species: Anisoscelis cincta Herrich-Schaeffer

Diagnosis: Medium sized species. Head. Basically black with median narrow broad longitudinal band and two stripes behind ocelli reddish brown. Not declivent; very slightly depressed behind ocelli; tylus blunt, projecting anteriorly and forming a rounded ridge; tylus and juga above the level of antenniferous tubercles; ratio length of head to inter-ocular distance = 2.23 - 2.83:1 (2.75:1); Ist antennal segment slightly shorter than head; labium variable in length, from short reaching only the anterior margin of IInd, to long extending up to the anterior margin of IVth sternite. Thorax. Declivous area of pronotum cinnamon, occasionally with fuscous to red markings; scutellum and corium light brown to reddish brown; corium with transverse laterally tapering yellowish white patch, not reaching the margin of corium. Pleural region with six yellow patches. Pronotum gradually declivent; calli with sculpture different from that of the disk; with or without two small tubercles on antero-median margin of calli; lateral margins straight, carinated, sometimes serrate or tuberculate; pronotal disk with or without median longitudinal carina; humeral areas usually level with dorsal part of the disk, occasionally deflected towards humeral angles or slightly raised;

posterior margin of pronotum slightly concave and depressed. Scutellum usually wider than long, occasionally as long as wide; transversely rugulose and punctate, with two transverse raised portions, one at base and the other median separated by a shallow transverse depression; distal portion medially elevated. Hind tibia (fig. I) with dilation lanceolate, wide or very narrow, usually without emarginations. Corium finely and densely punctated. Abdomen. VIIth tergite in males and VIIIth and IXth tergites in females with a yellowish white patch.

Male genitalia: Genital capsule (fig. A,B) - without subproctigeral sac; posterior margin medially slightly projecting posteriorly, with "V" shaped to rounded notch; without dorsal prongs. Parameres (fig. C,D) - shaft subrectangular; outer lobe wide in lateral view, and narrow and pointed in dorsal view; distal cavity small; shank usually widening distally, occasionally uniformly wide. Phallus (fig. E) - dorsal sac elongate, terminating in one pair of latero-dorsal lobes (a), variable in size and shape; processes 12a-b usually membranous, occasionally sclerotized; processes 13a-b usually close to process 3a-b but occasionally well separated; processes 3a-b flattened, process 4b usually present; process 5a very short and wide at base; first convolution usually with ventral projection (b), second convolution very short and close to the apex of the first and followed by an apical elongate uncoiled part.

Female genitalia: Ist gonocoxa short and wide, spermatheca tubular, without duct dilation; duct usually short, curved proximally, occasionally elongate with several curvatures; the distal coiled part of the duct long; spermathecal bulb capitate.

Geographical distribution: (Map 9) Three species are restricted to South America, and one has very wide distribution, extending from Mexico and the Antilles to the northern part of Argentina.

Discussion: The three formerly recognized species were included in the genus Leptoglossus sens. lat., and Allen 1969 in his revision of this genus placed them together in the "cinctus group" of species, to which another species here described as new is added to form the new genus Stalifera. This genus can be separated from the other genera of the Leptoglossus group of genera by: declivous area of pronotum cinnamon, occasionally with fuscous to red markings; pleural region with six yellow patches; VII tergite in males and VIIIth and IXth tergites in females with a yellowish white patch; shape of posterior margin of genital capsule; shape of shaft and shank of paramere; shape and size of dorsal sac of conjunctiva; presence of the following conjunctival processes: 12a-b, 13a-b and a single 4b; shape of processes 8a-b and 5a; and shape of Ist gonocoxa and spermatheca.

The name Stalifera is given in honour of C. Stâl.

KEY TO SPECIES

1. Tibial dilation elongate and narrow, ratio of length to width of tibial dilation = 3.79 - 6.76:1 (5.57:1), external margin not emarginate 2

\- Tibial dilation comparatively short and wide; ratio of length to width of tibial dilation = 1.63 - 3.12:1 (2.69:1); external slightly or deeply emarginated 3

2 (1) Declivous area of pronotum cinnamon with anterior margin of pronotum, calli, lateral margins and a rather broad median longitundinal band, bright red; tergites dark brown with a wide median longitudinal cinnamon to yellow ochre band..... .....crassicornis (p.271)

- Declivous area of pronotum entirely cinnamon; calli light reddish brown; tergites dark brown with scent gland areas yellow ochre ... .elongata (p.264)

3 (1) Pleural region without black patches; supracoxal lobes entirely yellow; tergites shiny blackish green; processes 12a-b moderately sclerotized, and 13a-b well separated from processes 3a-b .....cincta (p.251)

- Pleural region with black patches; supracoxal lobes with small rounded yellow patch; tergites dull black with scent gland areas dark yellow ochre; processes 12a-b membranous, and 13a-b close to processes 3a-b .....fasciata (p.259)

Stalifera cincta (H.-S.) 1835 Comb.n.

(Plate 26)

Anisoscelis cincta Herrich-Schaeffer, 1835: 91, fig. 315.

NEOTYPE ♂ Brasil (UZM) here designated [examined]

Theognis cinctus (H.-S.): Mayr, 1866: 103

Leptoglossus cinctus (H.-S.): Stål, 1870: 164.15; Distant, 1881:125;

Lethierry & Severin, 1894: 47; Barber and Bruner, 1947: 80; Wolcott, 1948: 197; Allen, 1969: 61.

General and differential diagnosis: Pleural region without black patches; supracoxal lobes entirely yellow; tergites shiny blackish green; shape and size of tibial dilation. Characteristic features of ♂♂: shape of genital capsule and parameres; shape and size of apical lobes (a) of dorsal sac and processes 12a-b, 3a-b, 13a-b, 9a-b, 8a-b and 5a-b. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

S. cincta is quite distinct from the other species of the genus; for differential characters see discussion on S. fasciata.

Description: General characters see Allen 1969: 61.

Male genitalia: Genital capsule (fig A,B) - posterior margin with middle part projecting posteriorly and with a median somewhat rounded or more or less "V" shaped notch; posterior margin slightly below the lateral margins; the latter horizontal, slightly expanded posteriorly. Paramere (fig. C,D) - shaft wide, with outer lobe rather long and acute; shank widening distally; hook moderately curved with blunt tip. Phallus (fig. E) - phallotheca slightly sclerotized dorsally; conjunctiva with long somewhat conical dorsal sac terminating in two lateral anteriorly directed lobes (a); conjunctiva armed with the following processes: 12a-b moderately sclerotized and pointed; 3a-b slightly sclerotized and flat; 13a-b membranous, small and somewhat lobuliform; 9a-b moderately sclerotized, very conspicuous and stout, with a short blunt tip projecting anteriorly; 8a-b heavily sclerotized, horizontal and short, each with two anterior

projections, the external flat and subtruncate and the internal one rounded and slightly sclerotized; 7a-b membranous, very conspicuous, bulging, with rounded tip; 5a (fig. E,F) heavily sclerotized, short, its first convolution wide with ventral margin uniformly curved, and the distal part of the second convolution straight.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular, and elongate with 4 curvatures.

Measurements and Ratios: (see table 25)

Geographical distribution: (Map 9) This species has a very wide distribution range, extending from Mexico and the Antilles to the northern part of Argentina. The material available for this study was collected in Mexico, Guatemala, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Surinam, French Guiana, Brasil, Bolivia, Paraguay and Argentina. Allen (1969) reported it also from Cuba and Peru.

Habitat and Biology: This species occurs in different ecological zones and in Venezuela it has been found in: Tropical dry forest, Premontane dry forest, Premontane moist forest, and Premontane wet forest. Adults were collected in the same country from June to December. Two females captured in August and October respectively were found with developed eggs; the eggs are subcylindrical with one side flat; length = 1.72mm, width = 1.15mm, height = 0.89mm.

S. cincta has been reported in Cuba, on Psidium sp and Byrsonia crassifolia (Barber and Bruner, 1947); in Venezuela it was found on fruits of Psidium sp and Anacardium occidentale, and in Guyana on Psidium sp.

Three specimens one each from Venezuela, Surinam and Brasil were found with an egg of Tachinid (Diptera), possibly Trichopoda pennipes Fabr. deposited on the head and another specimen from Brasil with two such eggs deposited on the head and collar respectively.

Discussion: The following variation were observed among the material examined: In specimens from Central America and northern part of South America, the transverse patch on corium was absent or reduced to a short narrow line; the same variation has been reported by Allen (1969) in specimens from Cuba.

Material examined.

a) Type material: Neotype of Anisoscelis cincta Herrich-Schaeffer. The type of this species could not be found in the ZSBS where it was supposed to be and it is very likely that it was destroyed during the last war. S. Cincta resembles S. fasciata and particularly S. elongata. In the interest of stability of nomenclature, it is necessary to designate a neotype; a male specimen from Brasil, Lagoa Santa, Reinhardt labelled "Lagoa S., Reinh., ♂" in UZM, was chosen as neotype of Anisoscelis cincta Herrich-Schaeffer, and accordingly labelled. This specimen fully agrees with the original description and illustration.

b) Other material: ARGENTINA: Puerto Aguirre, Alto Paraná, 21 - III - 1934, K.J. Hayward, 1 ♂ (BMNH); Terr. Misiones, Rio Paraná, Jun., Wagner, 1 ♂ (ZMU); Retamito, - V - 1895, D. Herrmann, 1 ♀ (NM); Mendoza, 1 ♀ (TM). BOLIVIA: Cochabamba, Merang, 1 ♀ (RNH) 1895, G. Fallow, 1 ♂ (MNHN);

Coroico, 1 ♀ (NR); 1 ♀ (NR). BRASIL: Amazonas, 1 ♂ (BMNH); Amazonas, Saunders, 1 ♂ (BMNH); Chapada, 780m., - XI - 1902, A. Robert, 1 ♂, 1 ♀ (BMNH); Santarem, 28 - I - 1892, 2 ♂, 1 ♀ (BMNH); 2 ♂ (BMNH); Pará, 1 ♀ (MNH); 3 ♂, 2 ♀ (ZSBS); Sao Paulo, 1 ♀ (DEI); Minas Geraes, Ouropreto, 20 - XII - 1898, 1 ♂ (MN); Bahia, 4 ♀ (MN); 1 ♂ (MNHN); P.J. Goyaz, 1 ♀ (MNHN); (IRSNB); Lagos Santa, Reinhardt, 3 ♂, 1 ♀ (UZM); 1 ♂ (UZM); Amazonas, Stevens, 1 ♂ (NR); Sao Paulo, 1 ♂, 2 ♀ (NR); 1 ♂, 1 ♀ (NR); 1 ♂ (ZI); Sao Paulo, 1 ♂ (NM); Natterer, 1 ♂, 2 ♀ (NM); Schott, 1 ♂ (NM); Matto Grosso, 1 ♀ (MLP). COLOMBIA: 1 ♀ (BMNH); Lake Sapatosa region, Chiriguana District, - VIII - IX - 1924, C. Allen, 1 ♂ (BMNH); Ocaña, 1895, G. Fallow, 2 ♂, 1 ♀ (MNHN); Bogotá, Lindig, 1 ♂, 2 ♀ (NR); 1 ♂, 1 ♀ (MNHU). COSTA RICA: Bahia de Salinas, 1 ♀ ?(ZMU); La Caja, 1920, P. Sarre, 1 ♂ (NMHN). FRENCH GUIANA: Cayene, 1 ♀ (NM). GUATEMALA: San Gerónimo, Champion, 1 ♀ (BMNH); Cubulco, Vera Paz, s.c., 1 ♂ (BMNH). GUYANA: Demarara, Pln. Hope, 29 - VI - 1932, F.A. Squire, on Psidium sp., 1 ♀ (BMNH). MEXICO: Rincon Guerrero, 840m. Sept., H.H. Smith, 1 ♀ (BMNH); Calderas, 360m, Champion, 1 ♀ (BMNH); 1 ♀ (NR). NICARAGUA: Chontales, Janson, 1 ♂ (BMNH). PANAMA: Volcan de Chiriqui, 1200-2400m, Champion, 1 ♂ (BMNH); Chiriquí, 1 ♀ (TM). PARAGUAY: Sapucay, W. Foster, 1 ♀ (BMNH); San Bernardino, K. Fiebrig, 1 ♀ (MNHU); Sta. Sofia, Reinoser, 1 ♀ (NM); 1893, P. Jordan, 1 ♂, 1 ♀ (NM). SURINAM: V - IX, Fruhstorfer, 34 specimens (NM); 1 ♀ (RNH); 4 ♂, 4 ♀ (RNH); Tibiti, Surinam Exp. 1948-1949, 5 - 8 - I - 1949, Goijskes, 2 ♀ (RNH); Zandery Savanne, 20 - IX - 1963, s.c., 1 ♀ (RNH); s.l., 3 - 6 - VIII - 1964, s.c., 1 ♀ (RNH); Caarolina, 10 - I - 1965, J. Broekkuzen, 1 ♀ (RNH); Zandery, 11 - IX - 1966,

Wvleg, 1 ♂ (RNH), VENEZUELA: Aragua: R. Grande 1100m, 3 - VII - 1956, 1 ♂ (IZA); Maracay, 450m, 29 - X - 1948, J. Loggiodice, 1 ♂ (IZA); Bolivar: Gran Sabana, Rio Chirimá, 1090m, 27 - X - 1966, J. & B. Bechyné, E. Osuna, 2 ♂ (IZA); Carabobo, Montalbán, 25 - XI - 1965, Cermeli, on Citrus sp., 1 ♀ (SSPA); Taborda, 6 - IX - 1949, Szumkowski, 1 ♀ (IZA); Mérida: 1 ♂ (NR); Monagas: Maturín, 0-100m, 5 - VIII - 1966, F. Fernández Yépez, C.J. Rosales, on Psidium sp., 3 ♂ (IZA); Jusepín, 24 - X - 1965, sc., on Psidium sp., 1 ♂ (IZA); Dist. Federal: Caracas, Drewsen, 1 ♂ (UZM).

c) Material without data: 1 ♀, labelled "46/20, Anisoscelis cincta, Walker's Catalogue", (BMNH).

Plate 26

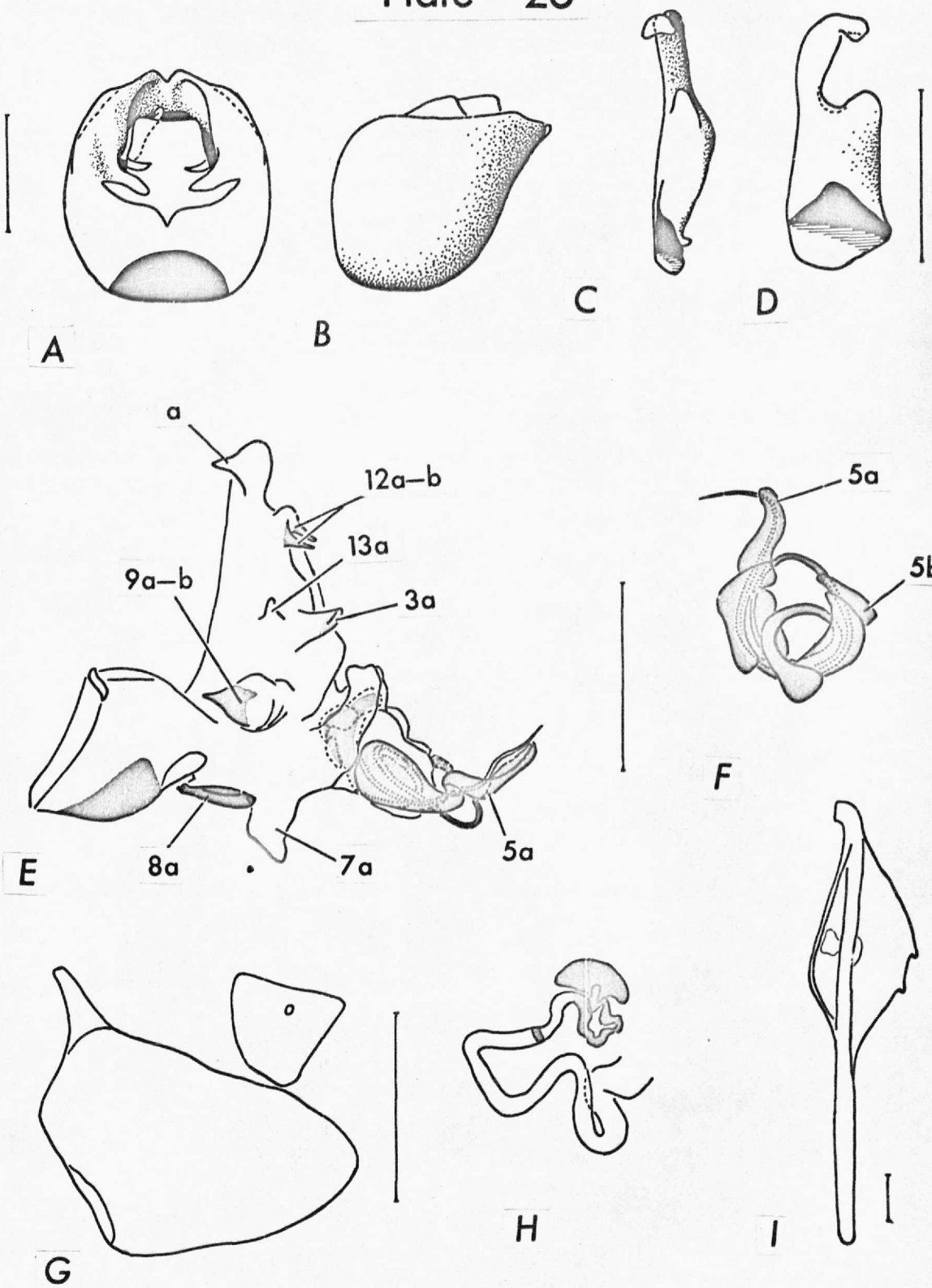


Table 25 Measurements (5 ♂♂ and 5 ♀♀ from 10 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.8–17.8	16.4	5	16.5–18.3	17.3
2 Head length	5	2.47–2.88	2.72	5	2.69–2.98	2.77
3 " width	5	1.90–2.24	2.09	5	2.09–2.29	2.18
Distance:						
4 inter-ocular	5	1.08–1.17	1.13	5	1.12–1.33	1.20
5 ante-ocular	5	1.23–1.52	1.35	5	1.38–1.57	1.43
Antennae:						
6 segm. I length	5	2.47–2.66	2.50	5	2.28–2.47	2.37
7 " II "	5	2.73–3.84	3.48	5	3.36–3.79	3.59
8 " III "	5	1.96–2.64	2.36	5	2.40–2.64	2.50
9 " IV "	3	3.50–4.08	3.85	5	3.60–4.32	3.95
Labium:						
10 segm. I length	5	2.12–2.81	2.49	5	2.51–2.85	2.64
11 " II "	5	1.95–2.49	2.28	5	2.31–2.85	2.57
12 " III "	5	1.10–1.27	1.16	5	1.15–1.52	1.29
13 " IV "	5	1.82–2.25	2.06	5	1.90–2.71	2.33
14 Pronotum length	5	2.73–3.64	3.23	5	3.26–3.60	3.46
15 " width	5	4.56–6.05	5.30	5	5.56–6.76	5.91
16 Scutellum length	5	1.86–2.33	2.13	5	2.10–2.33	2.21
17 " width	5	1.86–2.39	2.15	5	2.24–2.43	2.32
18 Hind tibia length	5	7.44–10.1	9.19	5	8.64–9.64	9.25
Tibial dilation:						
19 total width	5	1.29–2.40	1.92	5	1.96–2.49	2.24
external part:						
20 length	5	4.03–5.76	5.18	5	4.80–5.66	5.17
21 width	5	0.62–1.34	1.14	5	1.10–1.34	1.20
internal part:						
22 length	5	2.78–4.32	3.64	5	3.36–4.32	3.85
23 width	5	0.28–0.43	0.39	5	0.52–0.76	0.62
24 Undilated portion	5	2.97–3.64	3.33	5	3.16–3.60	3.37
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.65–6.47:1	6.02:1	5	6.08–6.54:1	6.24:1
1 / 18	5	1.73–1.93:1	1.78:1	5	1.80–1.89:1	1.87:1
2 / 3	5	1.23–1.35:1	1.30:1	5	1.14–1.30:1	1.27:1
6 / 2	5	0.89–0.96:1	0.91:1	5	0.82–0.89:1	0.85:1
10 / 2	5	0.85–1.02:1	0.91:1	5	0.92–0.98:1	0.95:1
9 / 6	3	1.05–1.53:1	1.57:1	5	1.45–1.85:1	1.66:1
15 / 16	5	2.31–2.64:1	2.48:1	5	2.38–2.65:1	2.67:1
20 / 18 %	5	52.5–59.3	56.3	5	53.4–58.7	55.8
22 / 18 %	5	35.2–43.9	39.6	5	38.2–44.8	41.6

Stalifera fasciata (Westwood), 1842, comb.n

(Plate 27)

Anisoscelis fasciata Westwood, 1842: 17. Holotype ♂ Brasil (UM) [examined].

Theognis fasciatus (Westwood): Mayr, 1866: 102.

Leptoglossus fasciatus (Westwood): Stål 1870, p.166.21; Lethierry & Severin, 1894: 47; Allen, 1969: 66.

General and differential diagnosis: Declivous area of pronotum straw yellow; calli, lateral margins of pronotum and area behind humeral angles fuscous to dark brown; tergites dull black with scent gland scars dark yellow ochre. Characteristic features of ♂♂: shape and size of tibial dilation; shape of genital capsule and paramere, shape and size of processes 4b, 9a-b and 5a-b. Those of ♀♀: shape and size of tibial dilation; shape of 1st gonocoxa and shape and size of spermatheca.

S. fasciata shows close relationships with S. elongata and S. crassicornis, sharing the following characters: pleural region with black patches; large lobes (a) on the apex of dorsal sac; processes 12a-b membranous and slender; shape and relative position of processes 13a-b and 3a-b; presence of a ventral projection (b) on process 5a; spermatheca comparatively short and thick. These characters distinguish S. fasciata, S. elongata and S. crassicornis from S. cincta.

S. fasciata can be distinguished from S. elongata and S. crassicornis by wider and shorter tibial dilation and stout ventral projection (b) of process 5a.

Description: General characters see Allen, 1969: 66.

Male genitalia: Genital capsule (fig. A,B) - median narrowed part of the posterior margin projecting posteriorly, with a deep, narrow "V" shaped median notch; posterior margin level with lateral margins; the latter slightly concave, somewhat rising posteriorly to form a wide postero lateral expansion. Paramere (fig. C,D) - shaft wide, with outer lobe short and wide; shank widening distally, hook moderately curved, terminating in a blunt dorso-medially curved tip. Phallus (fig. E) - phallotheca weakly sclerotized dorsally; conjunctiva with long dorsal sac, terminating in two wide somewhat flattened lobes (a); conjunctiva armed with the following processes: 12a-b membranous, slender and rather flat, 3a-b slightly sclerotized wide and flat; 13a-b lobuliform weakly sclerotized, placed very close to the processes 3a-b; 4b membranous, conspicuous and projecting dorsally; 9a-b slightly to moderately sclerotized, twisted, very conspicuous, projecting laterally; 8a-b heavily sclerotized, horizontal and short, each with two anterior projections, the external one flat and laterally acute, the internal one flat and blunt, slightly sclerotized; 7a-b membranous and not very conspicuous; 5a (fig. E,F) heavily sclerotized, short, the first convolution wide with a ventral stout projection (b), and the distal part of second convolution strongly curved.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular, comparatively short, with two proximal curvatures.

Measurements and Ratios: (see table 26)

Geographical distribution: (Map 9) Only known from Brasil. In the literature also reported from Argentina (Berg, 1940), but as mentioned by Allen (1969), not a single specimen of S. fasciata is present in the material of La Plata Museum; most of the material of this genus belongs to S. elongata sp.n, which Allen misidentified as S. crassicornis.

Discussion: Allen's description of the genitalia is somewhat confused; as he stated both the parameres and the genital capsule are similar to those of S. cincta but as discussed above they differ; he also overlooked the proximal lobes (= processes 4a-b) of aedeagus.

Material examined:

a) Type material: Holotype ♂ of Anisoscelis fasciata Westwood from Brasil labelled "Type Hem. 332, Anisoscelis fasciata Westwood, Hope Dept. Oxford. - Brasil" in UM collection.

b) Other material: BRASIL: Botafogo, M.R. Belg, 1 ♂ (BMNH), 1 ♂ (BMNH); Rio de Janeiro, 1 ♀ (BMNH); 1 ♀ (IRSNB); Botafogo, 1 ♀ (IRSNB); 1 ♂, 1 ♀ (UZM); Rio de Janeiro, Reinhardt, 1 ♀ (UZM); Eversmann, 1 ♂, 1 ♀ (ZI); 2 ♂, 4 ♀ (NM); Natterer, 1 ♂ (NM); Rio Preto, S.W. Boquerao, Sta. Rita, 1903, Penther, 1 ♀ (NM); 11 - XI - 1924, Nictheroy, 2 ♀ (ZSBS); 2 ♂ (ZSBS); Rio de Janeiro, 1 ♂, 1 ♀ (MNHU); 1 ♂ (MNHU); 1 ♀ (RNH); Macahe, - XII - 1928, E. Mortensen on Cactus fruits, 2 ♂, 1 ♀ (USNM).

Plate 27

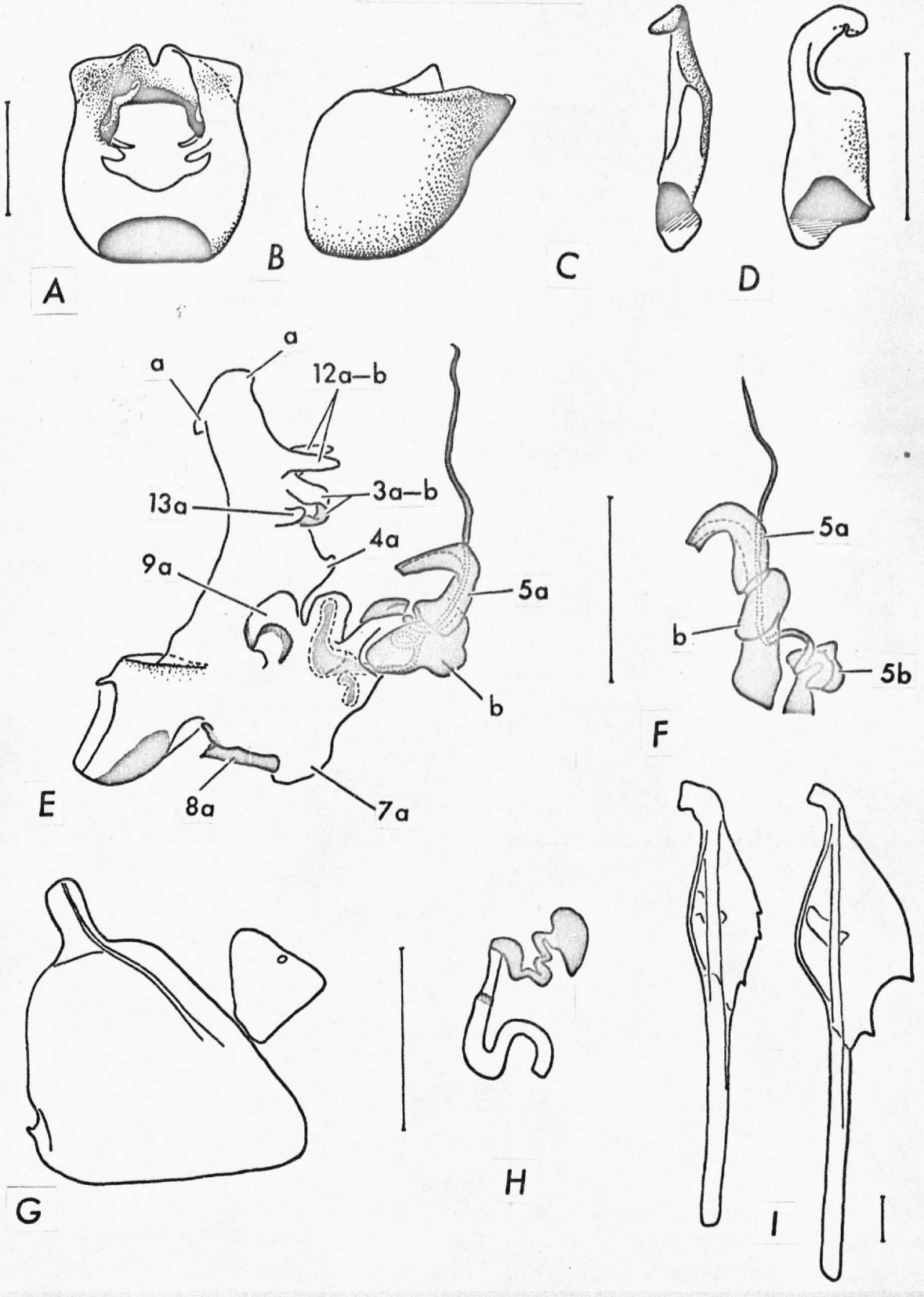


Table 26 Measurements (4 ♂♂ and 3 ♀♀ from 4 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	16.0–18.0	17.0	3	16.0–18.0	17.1
2 Head length	4	3.07–3.23	3.13	3	3.04–3.26	3.17
3 " width	4	2.09–2.29	2.19	3	2.05–2.24	2.15
Distance:						
4 inter-ocular	4	1.12–1.23	1.16	3	1.10–1.23	1.15
5 ante-ocular	4	1.40–1.57	1.49	3	1.48–1.63	1.54
Antennae:						
6 segm. I length	4	2.66–3.07	2.86	3	2.47–2.58	2.53
7 " II "	4	4.80–5.56	5.14	3	4.60–4.94	4.74
8 " III "	4	3.12–3.79	3.47	3	3.16–3.55	3.35
9 " IV "	2	4.08–4.84	4.46	2	3.98–4.46	4.22
Labium:						
10 segm. I length	4	3.17–3.62	3.39	2	3.42–3.62	3.49
11 " II "	4	3.04–3.59	3.31	2	3.42–3.62	3.51
12 " III "	4	1.44–1.80	1.64	1	1.82	1.82
13 " IV "	4	2.81–3.45	3.16	2	3.42–4.04	3.73
14 Pronotum length	4	2.68–3.40	3.03	3	2.83–3.21	2.98
15 " width	4	4.70–5.90	5.23	3	4.65–5.37	5.08
16 Scutellum length	4	1.74–2.07	1.89	3	1.88–1.95	1.91
17 " width	4	1.82–2.18	1.99	3	1.88–2.14	1.97
18 Hind tibia length	4	9.88–12.4	11.0	3	9.12–9.60	9.44
Tibial dilation:						
19 total width	4	1.48–1.96	1.77	3	2.16–2.64	2.40
external part:						
20 length	4	4.32–6.00	5.05	3	4.27–4.36	4.31
21 width	4	0.76–1.10	0.95	3	1.15–1.44	1.26
internal part:						
22 length	4	2.59–3.84	3.02	3	2.83–2.88	2.86
23 width	4	0.32–0.48	0.44	3	0.62–0.80	0.70
24 Undilated portion	4	4.80–5.52	5.21	3	4.12–4.46	4.26
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.21–5.70:1	5.43:1	3	5.26–5.57:1	5.39:1
1 / 18	4	1.44–1.67:1	1.53:1	3	1.75–1.87:1	1.81:1
2 / 3	4	1.34–1.50:1	1.42:1	3	1.45–1.48:1	1.47:1
6 / 2	4	0.84–0.99:1	0.91:1	3	0.78–0.81:1	0.79:1
10 / 2	4	1.02–1.16:1	1.08:1	3	1.05–1.12:1	1.10:1
9 / 6	2	1.52–1.59:1	1.56:1	2	1.61–1.75:1	1.68:1
15 / 16	4	2.62–2.86:1	2.76:1	3	2.47–2.75:1	2.65:1
20 / 18 %	4	42.8–48.0	45.7	3	45.0–46.8	45.6
22 / 18 %	4	24.4–30.7	27.3	3	30.0–31.0	30.2

Stalifera elongata sp.n

(Plate 28)

General and differential diagnosis: Tergites dark brown with scent gland scars yellow ochre. Characteristic features of ♂♂: shape of genital capsule and paramere; shape and size of processes 4b, 9a-b and 5a-b. Those of ♀♀: margin of internal dilation with a row of spine-like teeth; shape of Ist gonocoxa, and shape and size of spermatheca.

S. elongata shows close relationships with S. fasciata and S. crassicornis; the relationships of these three species, and the differences between S. elongata and S. cincta and fasciata has been already discussed. S. elongata differs from S. crassicornis by: the colour of pronotal disk and tergites; shape of processes 9a-b and 4b and shape and size of ventral projection (b) of process 5a.

Description: Head. Basically black with two stripes behind the ocelli, narrow medial longitudinal band and a band on genae dark yellow ochre to reddish brown. Labium yellow ochre, medial part of segments III to IV and apex of the IVth dark brown to black. All antennal segments reddish brown with distal half of the IVth usually yellow ochre. Tylus level or slightly elevated above juga; the latter slightly slender with rounded or occasionally truncate tip, the external margin slightly curved and the internal curved. Labium not reaching beyond the Vth sternite.

Thorax. Calli, scutellum and corium light reddish brown; corium with a yellowish white transverse patch on corium, tapering laterally, not reaching the costal margin; declivous area of pronotum straw yellow, with posterior margin yellowish white. Pleural region basically reddish brown to dark reddish brown, occasionally red to dark red with the following markings: On propleural region - basal half of supracoxal lobes and ventral part of postepimeral flange I yellowish white to yellow, dorsal part of the latter cinnamon or pale brown; ventral half of supracoxal lobes brown, occasionally black. On mesopleura - a patch on supracoxal lobes and ventral half of postepimeral flange II yellowish white to yellow; margins of supracoxal lobes and dorsal half of postepimeral flange II dark brown to black. On metapleura - a patch on supracoxal lobe, and processes of peritreme yellowish white to yellow. Pro and mesosternum black; metasternum reddish brown. Fore and middle legs pale brown, coxae with dark brown to black patches; hind legs reddish brown with external and internal surfaces of femur blackish; coxa and spines of femur black; internal tibial dilation sometimes with small yellowish white spot; undilated part of tibia cinnamon to pale brown. Pronotal calli slightly elevated; pronotum and corium with dense fine punctations; lateral margins straight and carinated, usually irregularly serrate; humeral areas horizontal, level with dorsal part of the disk; humeral angles horizontal and subobtuse; postero lateral margins usually entire, very occasionally finely tuberculate; posterior margin of pronotum slightly concave. Femur of males and females incrassate, in male thicker than in females, with stout spines on ventral surface and small spines on dorsal and lateral surfaces; hind tibia

(fig. I) dilation lanceolate, extending over 61% ($\frac{2}{3}$) of the length of tibia; internal dilation of both sexes with numerous small spine-like teeth on margin; undilated portion with double row of spines; in males dorsal surface of tibia with a single row of small spines. Abdomen. Tergites and connexivum dark brown; scent gland scars and anterior margin of each connexival segment yellow ochre. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males reddish brown to dark reddish brown, occasionally tinged with red or black.

Male genitalia: Genital capsule (fig. A,B) - posterior margin sinuate, in the middle slightly projecting posteriorly and with a deep "V" shaped notch, posterior margin somewhat above lateral margins; the latter somewhat curved, ascending posteriorly and expanded postero-laterally. Paramere (fig. C,D) - shaft wide, outer lobe very short, blunt; shank uniformly wide; hook very short and thick, moderately curved, terminating in thick rounded tip. Phallus (fig. E) - phallotheca slightly sclerotized dorsally; conjunctiva with long dorsal sac, terminating in two small apical lobes (a); conjunctiva armed with the following processes: 12a-b membranous, slender and somewhat flattened; 3a-b slightly sclerotized distally, wide and flat; 13a-b weakly sclerotized, placed very close to processes 3a-b; 4b membranous, small, wide and rounded; 9a-b slightly to moderately sclerotized, rugose, wide and flat, each projecting anteriorly into a subacute short tip; 8a-b heavily sclerotized, horizontal and short, each with two anterior projections, the external flat and laterally subacute and the internal one flat, blunt and slightly sclerotized; 7a-b membranous,

conspicuous; 5a (fig. E,F) heavily sclerotized, short, first convolution wide with a broad rounded ventral projection (b), distal part of second convolution curved.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular with two proximal curvatures.

Measurements and Ratios: (see table 27)

Geographical distribution: (Map 9) Only known from Argentina, Paraguay and Bolivia.

Discussion: All material of this species examined by Allen (1969) was identified as crassicornis, although he noticed several differences between the single specimen of crassicornis (the holotype) he examined and the other more southern material available to him; but having no other material of crassicornis he felt reluctant and unjustified to recognize these southern specimens as representing a new distinct species.

In the collection of NM, I found one specimen of this species determined by Signoret as "elongatus", but this name was never published and consequently it formally does not exist and is not available (Art 10 and 11 of International Code of Zoological Nomenclature). This name however conforms with the general appearance of this species and I am naming it as a new specific name, S. elongata sp.n.

Material examined.

a) Type material: Holotype ♂ of Stalifera elongata from Argentina,

Argentina, Catamarca, Andalgalá, 3 - III - 1939, Biraben Scott in MLP collection. Paratypes: ARGENTINA: Prov. de Mendoza, Jensen-Haarup, 2 ♂, 2 ♀ (UZM); cordilleras de Mendoza, 3 - III - 1907, s.c., 2 ♀ (UZM); Mendoza, 29 - IX - 5 - X - 1908, 1 ♂, 1 ♀ (UZM); Chacr, de Coria, Prov. de Mendoza, s.c., 3 ♂, 2 ♀, (UZM); Est. Pedregal, prov. de Mendoza, s.c., 1 ♂ (UZM); Mendoza, 1 ♀ (TM); Jensen-Haarup, 4 ♂, 2 ♀ (ZMU); Chaco de Santiago del Estero, Rio Salado, E.H. Wagner, 4 ♂ (MNHN); Prov. de Santiago del Estero, Chuna Pampa, 10 km. Rosario a Tucuman, 1909, E.R. Wagner, 1 ♀ (MNHN); prov. Mendoza, Poterillos, Reimoser, 1 ♀ (NM); Mendoza, Reimoser, 1 ♀ (NM); La Plata, 1 ♂ (NM); Pozo Maza, Formosa, 2 - II - 1937, 2 ♂ (MLP); Ing. Juarez, Formosa, 18 - V - 1939, 1 ♂, 1 ♀ (MLP); Mendoza, 1 ♀ (MLP); La Puerda Córdoba, 23 - I - 1940, Biraben, 1 ♂ (MLP); Amadores, Catamarca, 23 - III - 1939, Biraben - Scott, 1 ♂ (MLP); S. del Estero, Wagner, 1 ♂ (MLP); Campo del Cielo, - I - 1934, 1 ♂ (MLP); Andalgala, Catamarca, 3 - III - 1939, Biraben - Scott, 1 o (MLP); Hualfin, Catamarca 5 - III - 1939, s.c., 1 ♀ (MLP); Mendoza, 2 ♂, 2 ♀ (MLP); Chilecito, La Rioja, 1 ♂ (MLP); Sg. del Estero, Rio Salado, Wagner, 2 ♂, 2 ♀ (MLP); s.d., 5 ♂, 1 ♀ (MNHN); s.d., 2 ♂ (IZA); 1 ♂ (NR). BOLIVIA: Villa Montes, 10 - 18 - IX - 1930, Eisentraut, 1 ♂ (MNHU); Cochabamba, 2600m, Schoenfelder, 3 ♂, 3 ♀ (ZSBS). PARAGUAY: Berg, 1 ♂ (MLP).

Plate 28

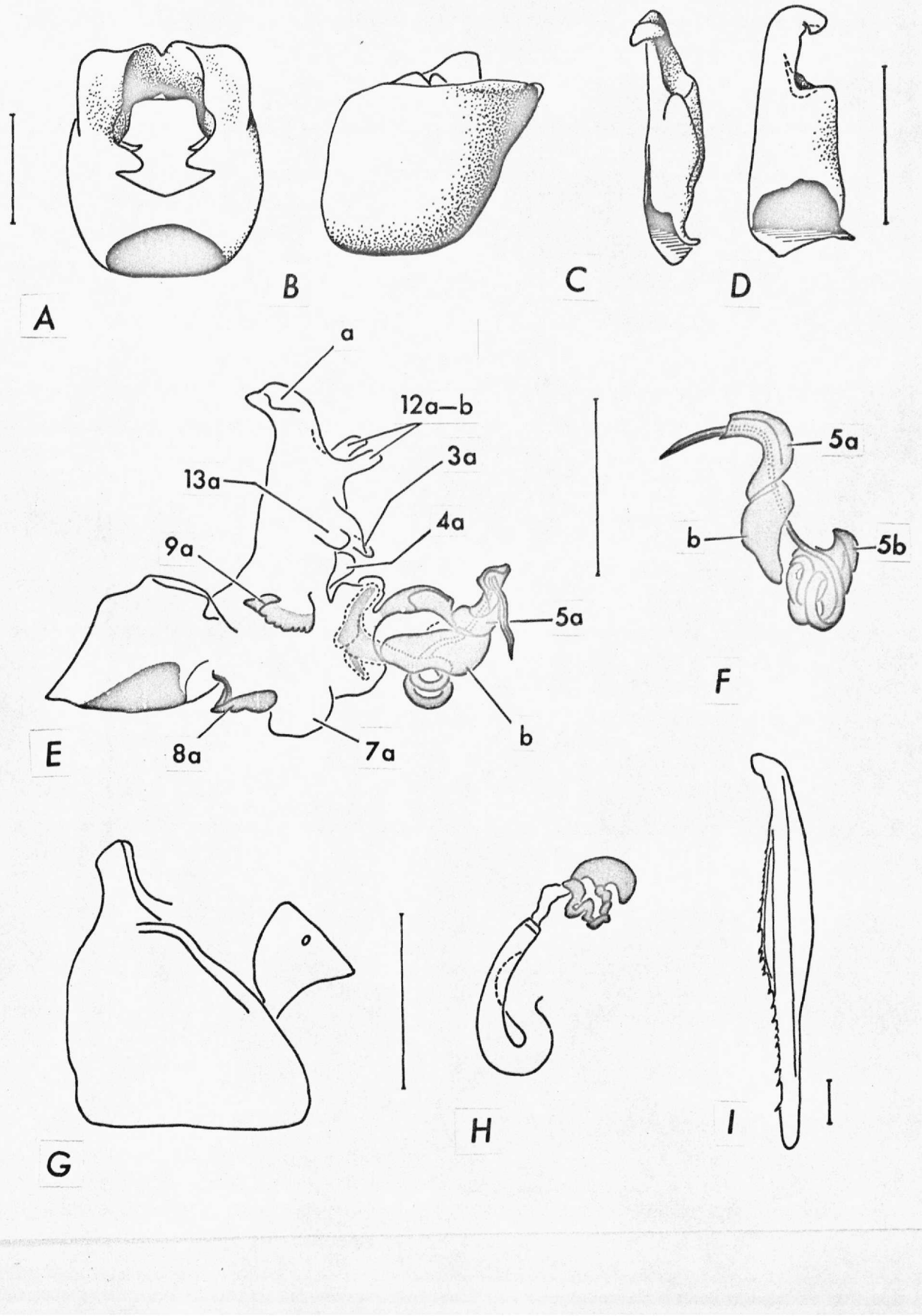


Table 27 Measurements (5 ♂♂ and 4 ♀♀ from 4 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	13.8–18.0	16.6	4	17.2–18.0	17.4
2 Head length	5	2.66–3.26	2.93	4	2.67–3.09	2.91
3 " width	5	1.88–2.26	2.07	4	2.09–2.26	2.15
Distance:						
4 inter-ocular	5	0.96–1.17	1.10	4	1.14–1.23	1.17
5 ante-ocular	5	1.25–1.52	1.41	4	1.40–1.55	1.47
Antennae:						
6 segm. I length	4	1.91–2.47	2.32	4	2.12–2.47	2.31
7 " II "	4	3.36–4.36	4.03	4	3.55–4.36	3.96
8 " III "	4	2.54–3.16	2.90	4	2.59–3.02	2.78
9 " IV "	3	2.88–3.26	3.08	2	2.68–2.73	2.70
Labium:						
10 segm. I length	5	2.75–3.45	3.12	4	3.04–3.30	3.18
11 " II "	5	2.66–3.26	2.96	4	2.75–3.19	2.95
12 " III "	5	1.50–1.90	1.65	3	1.53–1.67	1.58
13 " IV "	5	2.64–3.26	2.86	3	2.43–2.77	2.60
14 Pronotum length	5	2.64–3.40	3.09	4	3.12–3.45	3.23
15 " width	5	4.17–5.85	5.08	4	4.80–5.71	5.29
16 Scutellum length	5	1.71–2.28	1.99	4	1.93–2.26	2.07
17 " width	5	1.71–2.37	2.03	4	2.09–2.35	2.15
18 Hind tibia length	5	7.68–1.17	9.68	4	8.40–9.21	8.79
Tibial dilation:						
19 total width	5	0.96–1.15	1.06	4	1.25–1.39	1.33
external part:						
20 length	5	4.65–7.10	5.91	4	4.80–5.66	5.31
21 width	5	0.43–0.48	0.46	4	0.48–0.56	0.51
internal part:						
22 length	5	3.93–5.08	4.32	4	3.84–4.80	4.28
23 width	5	0.24–0.28	0.26	4	0.43–0.48	0.46
24 Undilated portion	5	2.49–3.64	3.11	4	2.49–3.12	2.86
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.18–5.95:1	5.66:1	4	5.82–6.29:1	5.97:1
1 / 18	5	1.89–1.53:1	1.71:1	4	1.92–2.04:1	1.97:1
2 / 3	5	1.39–1.44:1	1.41:1	4	1.27–1.40:1	1.35:1
6 / 2	4	0.71–0.85:1	0.81:1	4	0.76–0.81:1	0.79:1
10 / 2	5	0.99–1.17:1	1.06:1	4	0.98–1.23:1	1.09:1
9 / 6	3	1.16–1.34:1	1.25:1	2	1.25–1.26:1	1.25:1
15 / 16	5	2.43–2.60:1	2.55:1	4	2.48–2.62:1	2.31:1
20 / 18 %	5	56.7–67.9	61.0	4	57.1–64.6	60.4
22 / 18 %	5	36.9–52.9	44.6	4	45.7–52.1	48.6

Stalifera crassicornis (Dallas), 1857 comb.n

(Plate 29)

Anisoscelis crassicornis Dallas, 1852: 454.12. Holotype ♂, Colombia (BMNH) [examined]

Leptoglossus crassicornis (Dallas): Stål, 1870:166.22; Lethierry & Severin, 1894: 47; Allen, 1969: 64, fig. 2.

General and differential diagnosis: Declivous area of pronotum straw yellow; anterior margin of pronotum, calli, lateral margins and a rather broad median longitudinal band bright red; area behind humeral angles fuscous to black; tergites dark brown with a wide irregular median longitudinal band cinnamon to yellow ochre. Characteristic features of ♂♂ shape of genital capsule and paramere; shape and size of processes: 4b, 9a-b and 5a-b. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

For relationship of this species with the other species of the genus see discussion on S. fasciata and S. elongata.

Description: General characters see Allen, 1969: 64.

Male genitalia: Genital capsule (fig. A,B) - middle part of posterior margin slightly projecting posteriorly and with a deep and wide rounded to "V" shaped notch; posterior margin somewhat below the level of lateral

margins; the latter horizontal slightly raised posteriorly and slightly expanded postero-laterally. Paramere (fig. B,C) - shaft wide with outer lobe short, wide and blunt; shank widening distally; hook short, moderately curved, terminating in a subacute dorso-medially curved tip. Phallus (fig. E) - phallotheca moderately sclerotized dorsally; conjunctiva with long dorsal sac, terminating in two enlarged apical lobes (a); conjunctiva armed with the following processes: 12a-b membranous, slender and somewhat flattened; 3a-b slightly sclerotized distally, wide and flat; 13a-b weakly sclerotized, placed very close to processes 3a-b; 4b membranous, small and wide, not very conspicuous; 9a-b wide and flat, slightly to moderately sclerotized at margins; 8a-b heavily sclerotized, horizontal and short, each with two anterior projections, the external one flat and laterally acute, the internal one flat, blunt and slightly sclerotized; 7a-b membranous and conspicuous; 5a (fig. E,F) heavily sclerotized and short, first convolution wide with a rounded, comparatively narrow ventral projection (b), distal part of second convolution slightly curved.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) tubular with two proximal curvatures.

Measurements and Ratios: (see table 28)

Geographical distribution: (Map 9) Only known from northern part of South America, it appears to be confined to or endemic in territories adjacent to the frontier between Colombia and Venezuela. Allen reported it from Bolivia, Paraguay and Argentina, but these records actually refer to S. elongata.

Discussion: Allen's description of the genitalia is somewhat confused; as he stated both the parameres and the genital capsule are similar to those of S. cincta but as discussed above they differ; he also overlooked the proximal lobes (= processes 4a-b) of the aedeagus.

Material examined

a) Type material: Holotype ♂ of Anisoscelis crassicornis Dallas, from Colombia, labelled "Type, 11. Anisoscelis crassicornis" in BMNH collection.

b) Other material: COLOMBIA: Cúcuta, 18 - 20 - VII - 1930, H.J. MacGillavry, 1 ♀ (RNH). VENEZUELA: Zulia: near Maracaibo, 19 - VI - 1959, C.J. Rosales, 10 ♂, 9 ♀ (IZA); Trujillo; carret Panamericana, Hda. Aparilli, 9 - VIII - 1954, N. Angeles, 1 ♀ (IZA).

Plate 29

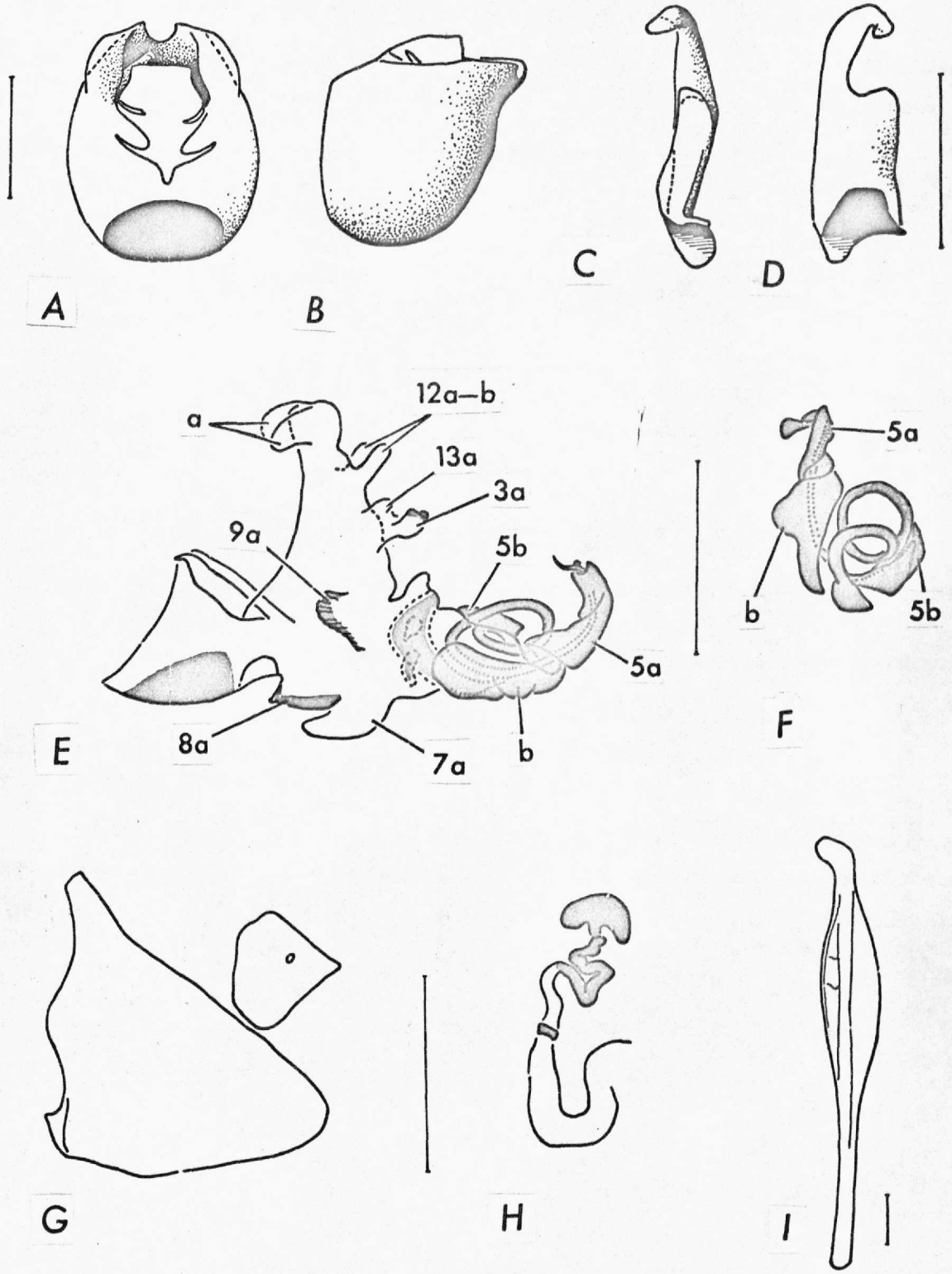


Table 28 Measurements (5 ♂♂ and 4 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	13.6-17.3	15.7	4	14.3-16.0	15.0
2 Head length	5	2.60-3.04	2.85	4	2.79-2.98	2.89
3 " width	5	1.93-2.10	2.03	4	1.91-2.05	1.98
Distance:						
4 inter-ocular	5	0.96-1.14	1.07	4	1.04-1.08	1.05
5 ante-ocular	5	1.14-1.38	1.29	4	1.33-1.40	1.35
Antennae:						
6 segm. I length	5	2.37-2.77	2.60	4	2.12-2.39	2.24
7 " II "	5	4.32-5.04	4.63	4	3.50-4.22	3.92
8 " III "	5	2.25-2.97	2.66	4	2.16-2.64	2.44
9 " IV "	5	2.88-3.60	3.16	4	3.02-3.12	3.09
Labium:						
10 segm. I length	5	2.77-3.42	3.10	4	2.96-3.19	3.08
11 " II "	5	2.60-3.26	2.99	4	2.85-3.13	3.02
12 " III "	5	1.33-1.55	1.44	4	1.50-1.61	1.54
13 " IV "	5	2.58-3.24	2.87	4	2.81-3.42	3.00
14 Promotum length	5	2.54-3.50	3.07	4	2.64-3.16	2.83
15 " width	5	3.98-5.23	4.70	4	4.12-4.84	4.35
16 Scutellum length	5	1.63-2.05	1.87	4	1.71-2.10	1.85
17 " width	5	1.71-2.09	1.93	4	1.71-2.10	1.85
18 Hind tibia length	5	8.01-9.84	9.12	4	7.68-9.21	8.20
Tibial dilation:						
19 total width	5	0.80-1.00	0.92	4	0.84-1.00	0.94
external part:						
20 length	5	4.22-5.52	4.93	4	3.84-5.18	4.55
21 width	5	0.33-0.48	0.42	4	0.38-0.48	0.43
internal part:						
22 length	5	2.88-3.50	3.23	4	2.97-3.55	3.07
23 width	5	0.24-0.28	0.25	4	0.24-0.28	0.27
24 Undilated portion	5	2.88-3.84	3.37	4	2.54-3.26	2.86
Ratios (figures refer to character numbers above).						
1 / 2	5	5.23-5.78:1	5.50:1	4	5.03-5.44:1	5.19:1
1 / 18	5	1.64-1.80:1	1.72:1	4	1.73-1.95:1	1.82:1
2 / 3	5	1.34-1.45:1	1.40:1	4	1.41-1.56:1	1.45:1
6 / 2	5	0.89-0.93:1	0.91:1	4	0.71-0.83:1	0.77:1
10 / 2	5	1.03-1.15:1	1.08:1	4	0.99-1.10:1	1.06:1
9 / 6	5	1.15-1.29:1	1.21:1	4	1.26-1.47:1	1.37:1
15 / 16	5	2.34-2.62:1	2.51:1	4	2.24-2.36:1	2.35:1
20 / 18 %	5	50.2-56.0	54.0	4	50.0-60.0	55.4
22 / 18 %	5	30.0-40.6	35.4	4	31.2-43.0	37.4

NARNIA Stål

(Plates 30 - 31)

Narnia Stål, 1862: 294. Type-species: Narnia femorata Stal by PRESENT DESIGNATION.

Narnia Stål: Stål, 1867: 544; 1870: 166; Distant, 1881: 126; Lethierry & Severin, 1894: 49; Van Duzee, 1917, 90; Gibson 1918: 1 - 4; Torre-Bueno, 1941: 51.

Diagnosis: Large to medium size species. Head. Basically black with the longitudinal band and stripes on dorsal and lateral surfaces reddish brown. Porrect, weakly depressed behind ocelli; tylus deflected, and both the tylus and juga above the level of antenniferous tubercles; ratio between length of head and the inter-ocular distance = 2.84 - 3.15:1 (3.02:1); Ist antennal segment almost half the length of the head; IVth antennal segment almost as long as the IIIrd; labium variable in length, from short reaching only the anterior margin of IVth, to long extending up to the anterior margin of the VIIth sternite, occasionally even beyond the genital segment. Thorax. Scutellum and corium reddish brown to dark brown; the latter with or without yellowish white transverse patch. Pleural region with black irregular patches and spots; sternal area dark brown to black. Pronotum declivent; calli with sculpture different from that of the disk; lateral margins sinuous; pronotal disk with median

longitudinal carina; humeral areas slightly depressed or level with dorsal part of the disk; humeral angles rounded or blunt; posterior margin concave and strongly depressed. Scutellum usually longer than wide, very occasionally as long as wide; transversally rugulose and slightly punctated, with two transverse raised portions on central area, the proximal higher than the distal, and apex medially carinated. Hind tibia (fig. I) with lanceolate dilation, without emarginations, usually the internal part wider than the external one, the latter occasionally absent. Corium finely punctated, occasionally not punctated. Abdomen. Sternites yellow ochre to black, with dark brown to black irregular patches; margins of all sternites yellow ochre to tan; sternites with median longitudinal depression.

Male genitalia: Genital capsule (fig. A,B) short and high - without subprotigeral sac; posterior margin usually slightly concave with inconspicuous median notch; lateral margins slightly or strongly oblique, raising posteriorly, slightly projecting dorso-laterally and deflected inward. Paramere (fig. C,D) - shaft wide at base, with a small dorsal depression (a) densely pilose, and without distal cavity; shank short without median lobe; hook strongly curved terminating in wide rather flat and curved tip; outer lobe absent. Phallus (fig. E) - phallotheca not sclerotized dorso laterally; dorsal sac without sclerotized parts usually terminating in two conspicuous membranous lobes (b) which sometimes are reduced to small apical lobes; processes 4a-b usually present and membranous; 9a-b heavily sclerotized elongate and wide; 8a-b irregularly sclerotized, horizontal, with external margin sinuous; 7a-b membranous

usually reduced and rugose, occasionally very conspicuous; 5a (fig. E,F) thick, with two elongate convolutions, the first one somewhat sinuate ventrally.

Female genitalia: Spermatheca (fig. H) short bulging for a short distance at base and with a narrow distal duct; spermathecal bulb capitate.

Pubescence: Body usually covered with very short, delicate, whitish hairs; dorsal surface of the head, antenna, sternal area, legs and sternites with long delicate hairs.

Geographical distribution: Only known from Central America and the south western part of U.S.A.

Discussion: Narnia was always considered as a genus distinct from Leptoglossus sens. lat. because of the rather short first antennal segment, in relation to the length of the head; some characters of the genitalia, indicate however that it is closely related to the genus Theognis of the Leptoglossus group of genera. The similarity of the shape of paramere, the bilobulate condition of dorsal sac, the shape of processes 9a-b and 8a-b and the shape and size of spermatheca indicate that the two genera are related.

KEY TO SPECIES

Pronotum uniformly reddish brown; propleural area reddish brown with a black patch and with spots; dorsal sac of conjunctiva

with two small lobes (b) .....femorata (p.279)

- With different combination of characters than above.....2

2 (1) Declivous area of pronotum and postepimeral flange I cinnamon, the latter with black spots; tergites yellow.....
.....snowi (p.286)

N. wilson: resembles very closely N. snowi and perhaps these two species are conspecific (for some differntiating characters see the discussion on N. wilsoni)

Narnia femorata Stål, 1862

(Plate 30)

Narnia femorata Stål, 1862: 296.154. Holotype ♀ Mexico (NR) [examined, dissected]

Narnia femorata Stål: Stål, 1870: 166.1; Distant, 1881: 127, pl. 13, fig. 4; Lethierry & Severin, 1894: 49; Van Duzee, 1917: 90; Gibson, 1918: 1-4; Torre-Bueno, 1941: 51.

Narnia pallidicornis Stål, 1870: 166. Holotype ♀ U.S.A (NR) [Synonymized by Gibson, 1918: 1, examined, dissected].

Narnia inornata Distant, 1892: 361, pl. 33, fig. 10. LECTOTYPE ♂, Mexico (BMNH) here designated [examined, dissected]. Syn.n.

Narnia inornata Distant: Lethierry & Severin 1894: 49; Van Duzee 1917: 90; Gibson 1918: 1-4; Torre Bueno, 1941: 51.

General and differential diagnosis: Pronotum uniformly reddish brown; propleural area with a black patch on pleural calli and with small black spots. Characteristic features of ♂♂: shape of genital capsule and paramere; size of apical lobes (b) of dorsal sac, shape of processes 4a-b, 9a-b, 8a-b and 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of basal part of spermatheca.

Description: Head. Basically black, two stripes behind ocelli usually extending up to the bases of antenniferous tubercles and a lateral band usually extending from maxillary plates to the neck, pale reddish brown. Ist labial segment yellow ochre, segments II to IV light brown with darker anterior surfaces. Ist antennal segment brown, segments II to IV cream, sometimes the distal half of IInd and IIIrd segments brownish, but occasionally the two segments entirely brownish. Tylus deflected, blunt, very slightly projecting anteriorly, level with juga; the latter short, slightly bulging. Labium very long, occasionally reaching beyond the apex of abdomen. Thorax. Pronotum, scutellum, corium and pleural region reddish brown; corium sometimes with elongate yellowish white patch at the level of the cross vein m-cu. Pleural region with the following black marking: On propleural region - pleural calli and some scattered spots. On mesopleura - wide central patch extending from anterior to posterior margin and some scattered spots. On metapleura - wide antero-dorsal patch and some scattered spots. Sternal region black. All legs pale reddish brown to dark reddish brown; all coxa with black spots and patches; hind tibial dilation brown usually with two yellowish white small patches; undilated part of hind tibia yellow ochre to pale brown. Pronotal calli

not elevated, pronotum declivent with small dense punctation; humeral areas slightly depressed; humeral angles blunt, horizontal or slightly ascending; posterior margin deeply depressed and concave. Femur of males strongly incrassate with stout spines on ventral surface, and small ones on dorsal and lateral surfaces; femur of females narrow with comparatively small spines; hind tibia (fig. I) usually elongate with external margin usually wider than the internal one, occasionally the former absent. Abdomen. Tergites dark brown to black, with yellow ochre margins; connexivum usually dark brown with yellow ochre sutures, sometimes the anterior segments are almost entirely yellow ochre with small dark brown patches, the latter increasing in size posteriorly on each segment. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males, dark yellow ochre to pale reddish brown, with some irregular dark brown to black patches.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly concave with moderate quadrangular notch; about level with lateral margins; the latter slightly ascending and projecting posteriorly. Paramere (fig. C,D) - shaft slightly projecting laterally; internal margin sinuous. Phallus (fig. E) - dorsal sac terminating in two small apical lobes (b); conjunctiva armed with the following processes: 4a-b membranous, not very conspicuous and flat; 9a-b heavily sclerotized elongate, and wide with dirsal margin concave near the apex; 8a-b each with two anterior projections, the internal one flat rounded and wide, the external one pointed; 7a-b membranous, very conspicuous and bulging; 5a (fig. E,F) elongate and thick.

Female genitalia: Ist gonocoxa, VIIIth laterotergite and spermatheca as shown in figs. G and H respectively.

Measurements and Ratios: (see table 29)

Geographical distribution: (Map 10) Only known from Central America and U.S.A., the material available for this study was collected in: Mexico, Guatemala and in U.S.A. (Texas and California), but it was also recorded from Arizona.

Discussion: This species is quite variable in many aspects such as: general size of the body; transverse patch on corium might be present or absent; tibial dilation might be large or reduced and the external dilation entirely absent; the whole of the margin of the internal dilation may be slightly convex or its basal $\frac{2}{3}$ slightly concave.

Material examined.

a) Type material: Holotype ♀ of Narnia femorata Stål, labelled "Typus. Mexico, Signt." in NR collection.

Narnia inornata Distant 2 ♂♀ syntypes: both from Mexico, labelled "Type, Amula, Guerrero, 6000 ft., Aug. H.H. Smith" in BMNH collection; the ♂ was designated and labelled as lectotype, and the other specimen as paralectotype. N. irornata is identical with N. femorata and is here formally synonymized with the latter.

Holotype of Narnia pallidicornis Stal from U.S.A. labelled "Typus, Texas, Belfrage" in NR collection.

b) Other material: GUATEMALA: San Gerónimo, Champion, 1 ♂ (BMNH).

MEXICO: Boucard, 3 ♂, 1 ♀ (NR); Sallé, 1 ♂ (NR); Sierra Mixtera, C.A. Purpus, 2 ♂, 2 ♀ (NMHU); Env. de Puebla, 1912, A. Gineste, 1 ♂, 2 ♀ (MNHN); Oaxaca, Puerto Angel, 1903, L. Diguet, 1 ♂, (MNHN); 1856, 1 ♀ (MNHN); Puebla, 1911, A. Gineste,1 ♂ (MNHN); Jalisco, Guadalajara, 1903, L. Diguet, 2 ♀ (MNHN); 1895, Sallé, 1 ♀ (MNHN); Cuernavaca, Morelos, 12 - XI - 1935, 1 ♂ (ZI); Procopp, 1 ♂ (TM); Cuernavaca, January, Bilimek, 2 ♂ (NM); 1871, s.c., 1 ♂, 1 ♀ (NM); Orizaba, - II - 1833, s.c., 1 ♀ (NM); 1 ♂, 1 ♀ (NM); Volcán Colina, 20 - X - 1918, J. Lave, 8 ♂, 2 ♀ (ZSBS); 1 ♂, 1 ♀ (MNHU); 2 ♂ (BMNH); Baja California, Cabo San Lucas, 20 - III - 1959; Baja California, Diguet, 1 ♀ (MNHN). U.S.A.: H. Lemche, 1 ♂ (ZMU); 1 ♂ (RNH); Texas, 1 ♀ (ZMU).

Plate 30

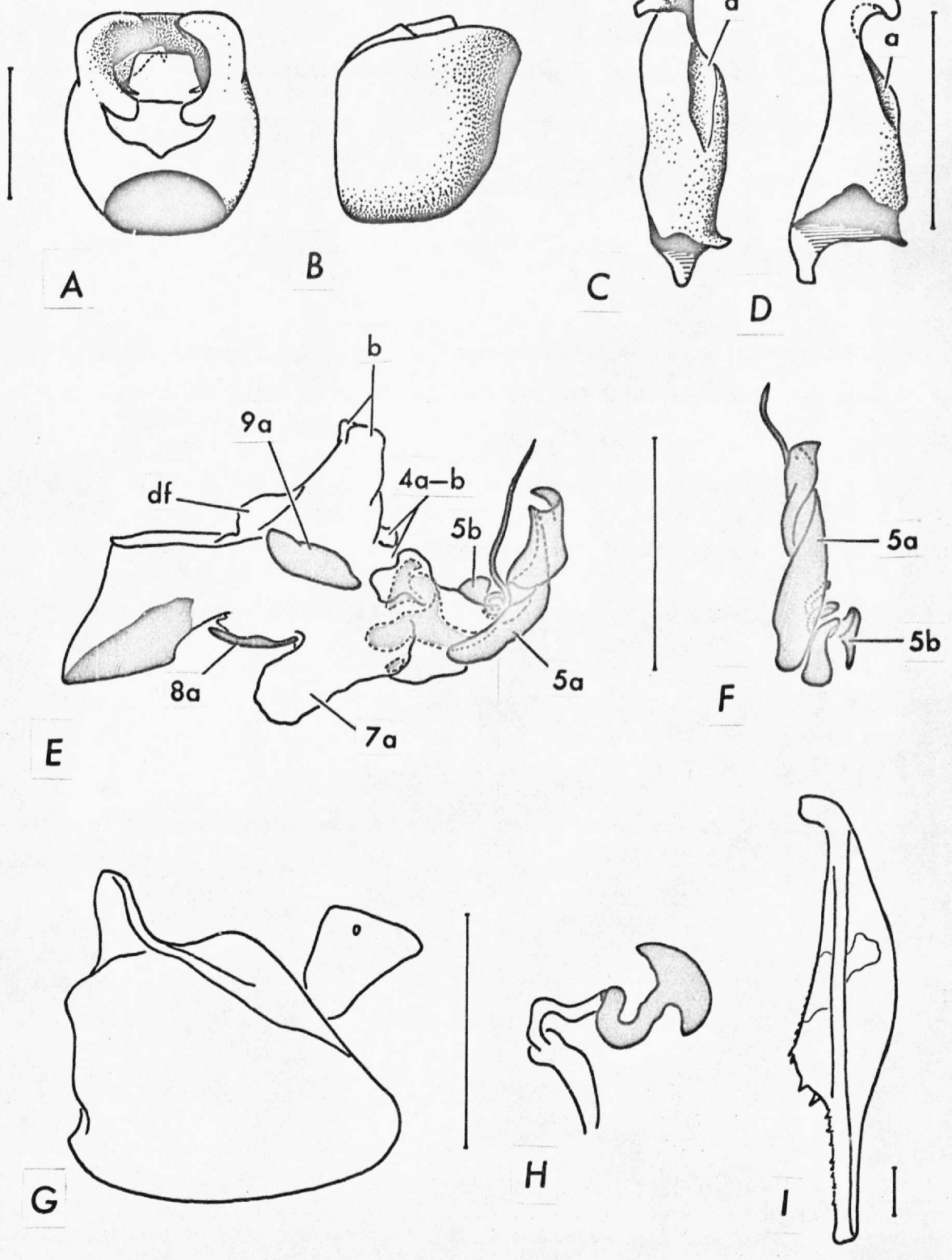


Table 29 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	13.6–18.0	15.7	5	14.0–18.0	16.7
2 Head length	5	2.94–3.43	3.15	5	2.75–3.42	3.19
3 " width	5	1.85–2.24	2.02	5	1.91–2.14	2.07
Disttance:						
4 inter-ocular	5	0.95–1.14	1.04	5	0.96–1.14	1.08
5 ante-ocular	5	1.38–1.57	1.50	5	1.63–1.69	1.48
Antennae:						
6 segm. I length	4	1.86–2.09	2.01	5	1.71–2.09	1.91
7 " II "	4	3.84–4.41	4.16	5	3.26–4.46	4.05
8 " III "	4	2.68–2.97	2.81	5	2.40–3.12	2.93
9 " IV "	4	2.64–3.64	3.11	4	2.40–3.64	2.98
Labium:						
10 segm. I length	5	2.49–3.80	3.15	4	2.85–3.62	3.28
11 " II "	5	2.75–3.80	3.26	4	2.77–3.61	3.28
12 " III "	5	1.14–1.52	1.36	4	1.23–1.42	1.30
13 " IV "	5	3.43–5.13	4.43	4	3.42–4.97	4.43
14 Pronotum length	5	2.44–3.88	3.24	5	2.88–3.64	3.31
15 " width	5	3.45–4.99	4.32	5	4.27–5.28	4.90
16 Scutellum length	4	1.72–2.39	1.90	5	1.71–2.28	2.03
17 " width	4	1.42–1.90	1.61	5	1.61–1.99	1.82
18 Hind tibia length	5	7.68–9.74	8.41	5	6.81–9.07	8.21
Tibial dilation:						
19 total width	5	0.80–1.96	1.47	5	0.80–1.92	1.51
external part:						
20 length	4	4.46–6.48	5.30	5	3.36–5.75	4.76
21 width	4	0.56–0.96	0.70	5	0.24–0.91	0.59
internal part:						
22 length	5	2.40–3.88	3.01	5	3.02–4.80	4.24
23 width	5	0.28–0.62	0.50	5	0.33–0.68	0.59
24 Undilated portion	5	2.01–2.64	2.33	5	2.40–2.64	2.48
Ratios: (figures refer to character numbers above).						
1 / 2	5	4.40–5.27:1	4.98:1	5	4.90–5.75:1	5.23:1
1 / 18	5	1.77–1.95:1	1.86:1	5	1.90–2.20:1	2.03:1
2 / 3	5	1.48–1.66:1	1.55:1	5	1.43–1.61:1	1.54:1
6 / 2	4	0.60–0.68:1	0.65:1	5	0.57–0.62:1	0.59:1
10 / 2	5	0.84–1.10:1	1.00:1	4	0.99–1.09:1	1.04:1
9 / 6	5	1.23–1.74:1	1.54:1	4	1.40–1.74:1	1.56:1
15 / 16	4	2.00–2.42:1	2.22:1	5	2.27–2.49:1	2.41:1
20 / 18 %	4	56.0–66.5	63.0	5	49.3–63.5	57.9
22 / 18 %	5	24.6–50.7	35.7	5	44.3–55.3	51.6

Narnia snowi Van Duzee, 1906

(Plate 31)

Narnia snowi Van Duzee, 1906: 384. Holotype ♀ U.S.A.

General and differential diagnosis: Declivous area of pronotum and postepimeral flange I cinnamon, the latter with black spots. Characteristic features of ♂♂: shape of genital capsule and paramere, shape and size of apical lobe (b) of dorsal sac, shape of processes 4a-b, 9a-b, 8a-b and 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of basal part of spermatheca.

Description: Head. Basically black, with two stripes behind ocelli occasionally extending up to bases of antenniferous tubercles, and a lateral band usually extending from antenniferous tubercles to the neck, occasionally also over juga, pale reddish brown. Ist labial segment dark yellow ochre, IInd to IVth brown to dark brown, becoming darker distally. All antennal segments pale reddish brown, lateral surface of Ist segment sometimes brown to dark brown. Tylus deflected, and blunt slightly projecting anteriorly, and slightly elevated between juga; the latter short, slightly bulging. Labium reaching the anterior margin of the VIIth sternite. Thorax. Calli, area between humeral angles of pronotum, scutellum, corium and pleural region dark brown or black, declivous area of pronotum, postepimeral flange I and III, cinnamon, the former sometimes

with black spots; corium with an elongate transverse yellowish white band. Sternal area black. Coxa, trochanter and femur of fore and middle legs brown to dark brown, and tibia and tarsus cinnamon; hind legs dark brown to black; a spot on internal tibial dilation, undilated part of tibia and the tarsus cinnamon. Pronotal calli not elevated; pronotum declivent, with small dense punctations; humeral areas horizontal, level with dorsal part of disk; humeral angles rounded; posterior margin of pronotum deeply depressed and concave. Femur in both sexes incrassate, with stout spines on ventral side, and small spines on dorsal and lateral surfaces; hind tibia (fig. I) elongate and narrow, the external dilation usually shorter than the internal one, occasionally absent. Abdomen. Tergites yellow; connexivum cinnamon with dark brown to black patches on posterior half of each segment. Sternites dark brown to black; lateral areas and posterior margins of each segment cinnamon to yellow ochre; genital segments in both sexes cinnamon to yellow ochre with brown patches.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly concave, with very shallow notch, and below the level of lateral margins, the latter rapidly ascending posteriorly, forming a rounded posterior projection. Paramere (fig. C,D) - shaft bent medially; shank with internal half unsclerotized. Phallus (fig. E) - conjunctiva with short dorsal sac, apical lobes of the latter (b), somewhat bulging and diverging; conjunctiva armed with the following processes: 9a-b heavily sclerotized, stout and wide, with the dorsal margin concave near the apex; 8a-b each with two anterior flat and acute projections; 7a-b membranous and rugose,

not very conspicuous; 5a (fig. E,F) elongate and thick, second convolution curved.

Female genitalia: Ist gonocoxa, VIIIth laterotergite and spermatheca as shown in figs. G and H respectively.

Measurements and Ratios: (see table 30)

Geographical distribution: (Map 10) Only known from U.S.A.

Material examined.

U.S.A.: Arizona, near Globe, 9 - X - 1951, E.C. Zimmerman, 4 ♂, 3 ♀ (BMNH); s.l., Chiricahui Mts., 8 - VII - 1935, 3 ♂, 2 ♀ (ZI); California, - III - 1932, 1 ♂, 2 ♀ (ZI); Arizona, Huachuea Mts., 8 - VII - 1905, 1 ♂ (ZI).

Plate 31

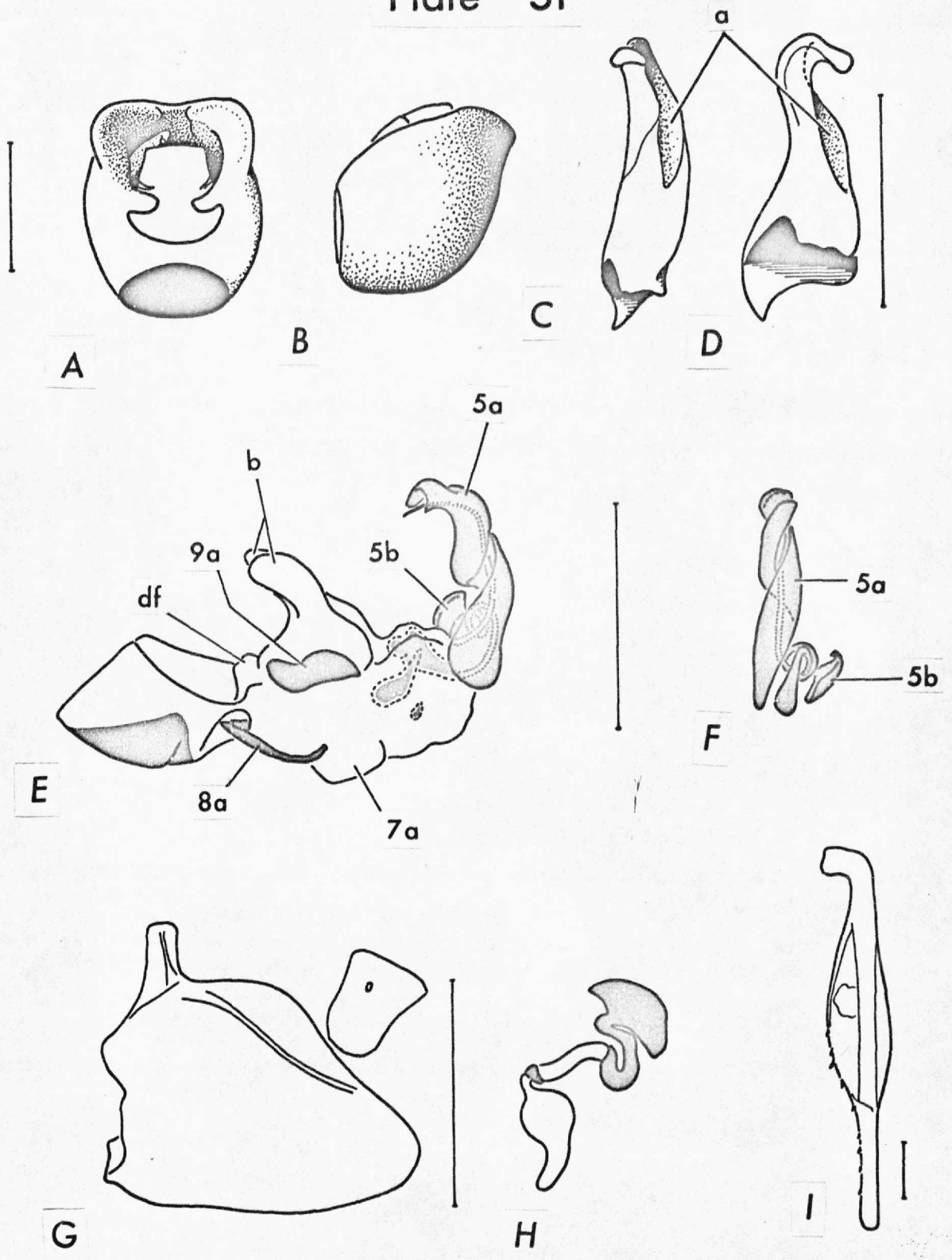


Table 30 Measurements (4 ♂♂ and 3 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	12.8-16.0	14.7	3	15.3-17.0	15.9
2 Head length	4	2.39-2.94	2.74	3	2.85-3.09	2.93
3 " width	4	1.67-1.91	1.81	3	1.93-2.01	1.97
Distance:						
4 inter-ocular	4	0.95-1.06	1.02	3	1.14-1.15	1.14
5 ante-ocular	4	1.21-1.44	1.34	3	1.44-1.52	1.47
Antennae:						
6 segm. I length	4	1.33-1.80	1.59	2	1.65-1.71	1.68
7 " II "	4	2.88-4.08	3.39	2	3.40-3.45	3.42
8 " III "	4	1.92-2.64	2.24	2	2.40-2.49	2.44
9 " IV "	4	1.96-2.59	2.28	2	2.49-2.59	2.54
Labium:						
10 segm. I length	4	2.66-3.24	2.97	3	3.13-3.23	3.19
11 " II "	4	2.56-3.34	2.94	3	3.15-3.30	3.22
12 " III "	4	1.14-1.42	1.31	3	1.19-1.33	1.28
13 " IV "	4	3.47-4.67	4.20	3	4.21-4.57	4.37
14 Pronotum length	4	2.49-3.07	2.74	3	2.92-3.36	3.08
15 " width	4	3.79-4.70	4.29	3	4.75-4.99	4.89
16 Scutellum length	4	1.61-2.01	1.82	3	1.99-2.07	2.01
17 " width	4	1.40-1.80	1.67	3	1.93-2.09	2.01
18 Hind tibia length	4	5.28-6.96	6.43	3	6.48-7.20	6.80
Tibial dilation:						
19 total width	4	0.48-1.25	0.77	3	0.96-1.34	1.08
external part:						
20 length	3	2.73-3.55	3.05	3	2.40-3.98	3.15
21 width	3	0.09-0.38	0.20	3	0.24-0.38	0.33
internal part:						
22 length	4	2.78-3.84	3.35	3	3.36-3.84	3.56
23 width	4	0.24-0.48	0.37	3	0.48-0.52	0.49
24 Undilated portion	4	1.63-2.11	1.89	3	2.16-2.35	2.23
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.26-5.44:1	5.30:1	3	5.04-5.96:1	5.42:1
1 / 18	4	2.21-2.42:1	2.28:1	3	2.32-2.36:1	2.33:1
2 / 3	4	1.43-1.55:1	1.51:1	3	1.41-1.56:1	1.48:1
6 / 2	4	0.47-0.63:1	0.58:1	3	0.55-0.57:1	0.57:1
10 / 2	4	1.03-1.11:1	1.08:1	3	1.04-1.13:1	1.08:1
9 / 6	4	1.28-1.62:1	1.43:1	3	1.45-1.56:1	1.51:1
15 / 16	4	2.12-2.52:1	2.35:1	3	2.38-2.48:1	2.43:1
20 / 18 %	4	42.6-51.7	47.4	3	37.0-55.2	46.3
22 / 18 %	4	47.4-55.1	52.0	3	51.8-52.3	52.3

Narnia wilsoni Van Duzee 1906

No specimen of this species were available for examination. The species was described together with N. snowi, and was based on two females from California, La Jolla. According to the original description this species resemble so closely N. snowi that they could be regarded as conspecific; the most important distinctive characters mentioned in the literature are: "lower surface of the head, antennae, base of the rostrum, bucculae and legs bright ferruginous" or red, "antenna shorter and thicker than any other described species."

THEOGNIS Stål

(Plates 32 - 34)

Theognis Stål, 1862: 294. Type-species: Theognis lineosus Stål by PRESENT DESIGNATION.

Theognis Stål: Mayr, 1865: 434; 1866: 101; Stål, 1867: 544; Kiritschenko, 1935: 191; Hussey, 1953: 33.

Diagnosis: Medium sized to small species. Head. Dorsal and lateral surfaces with narrow yellow ochre longitudinal bands; Declivent; slightly or well depressed behind ocelli; with medial longitudinal carina, sometimes very prominent reaching beyond the ocelli; tylus slightly projecting anteriorly, tylus and juga below the level of antenniferous tubercles; ratio length of head to inter-ocular distance = 2.09 - 2.59:1 (2.50:1). Ist antennal segment shorter than head or slightly longer; labium variable in length, from short reaching only the anterior margin of IIIrd, to long extending up to the posterior margin of the IVth sternite. Thorax. Pronotum, scutellum and corium brown; all margins of pronotum and a median longitudinal line yellowish white; all veins of corium or at least of its distal half, yellowish white; with transverse narrow yellowish white band across the corium. Pleural region dark brown to black, with longitudinal yellow ochre narrow bands. Pronotum gradually declivent; calli with sculpture different from that of the disk, with two small tubercles

on antero-median margin; lateral margins straight; pronotal disk with or without median longitudinal carina; humeral areas level with central part of disk; posterior margin of pronotum straight or slightly concave, and slightly depressed. Scutellum usually wider at base than long occasionally as long as wide or longer; with or without punctures, transversely rugulose, with basal $\frac{2}{3}$ elevated and flat distally. Hind tibia (fig. I) with oval or somewhat rounded dilation, without emarginations. Corium finely or deeply punctated. Abdomen. Tergites brown to dark brown. Sternites brown with irregular pale brown and yellow ochre patches, posterior margin of each sternite and intersegmental membrane, yellow ochre.

Male genitalia: Genital capsule (fig. A,B) - slightly tapering posteriorly; without subproctigeral sac; posterior margin with or without median notch, without dorsal prongs. Paramere (fig. C,D) - shaft wide with dorsal slightly depressed area (a) densely pilose and without distal cavity; shank projecting dorsally at right angle to the shaft, without median lobe; outer lobe absent. Phallus (fig. E) - phallotheca usually very slightly sclerotized laterally; dorsal sac terminating in two conspicuous membranous lobes (b), without sclerotizations; processes: 4a-b usually present; 9a-b and 8a-b heavily sclerotized and elongate.

Female genitalia: Spermatheca short, bulging for a short distance at base, followed by a narrow duct, spermathecal bulb capitate usually projecting at both extremities.

Pubescence: Body with very thin and short hairs, sternal area and appendages with longer hairs; sternites with short dense hairs.

Geographical distribution: (Map 11) Known only from Central America.

Discussion: see discussion under Leptoglossus.

KEY TO SPECIES

Humeral angles produced laterally in form of lanceolate processes; pronotum without transverse yellow ochre band or patch; tibial dilation somewhat rounded; posterior margin of genital capsule with quadrangular notch, lateral margins of genital capsule slightly concave and ascending posteriorly.....
.....lanceata (p.304)

- With different combination of characters as above.....2

2 (1) Pronotum with wide yellow ochre patch on declivous area; lateral margins of genital capsule more or less horizontal; postero ventral surface of genital capsule concave, internal margin of paramere sinuate; shank comparatively narrow and tapering distally; processes 4a-b present or absent, when present small and moderately sclerotized.....subauratus (p.299)

- Pronotum with narrow yellow ochre transverse band between humeral angles; lateral margins of genital capsule sinuous; postero ventral surface of genital capsule very slightly concave;

internal margin of paramere slightly concave; shank not tapering distally; processes 4a-b always present, membranous and conspicuous.....

.....lineosus (p.295)

Theognis lineosus Stål 1862 comb. rev.

(Plate 32)

Theognis lineosus Stål, 1862: 295, 153. Lectotype ♂ Mexico (NR), designated by Allen (1969: 74) [examined]

Leptoglossus lineosus (Stål): Stål, 1870:164.16; Distant, 1881: 126, pl. 12, fig. 17; Lethierry & Severin, 1894: 49; Allen, 1969: 73.

General and differential diagnosis: In addition to the characters mentioned by Allen (1969: 76) the following are characteristic of ♂♂: shape and size of genital capsule and paramere, shape and size of apical lobes (b) of dorsal sac, shape of processes 4a-b, 9a-b, 8a-b, and 5a. Those of ♀♀: shape of Ist gonocoxa and size of basal part of spermatheca. Ratios: head length/head width = 1.20 - 1.24:1 (1.22:1); body length/ head length = 6.61 - 7.03:1 (6.90:1).

Description: General characters see Allen, 1969: 73.

Male genitalia: Genital capsule (fig. A,B) - posterior margin below the level of lateral margins, with a shallow median notch, lateral margins sinuous and slightly ascending posteriorly. Paramere (fig. C,D) - internal margin of shaft slightly concave, external margin not expanded; shank flat, not tapering distally. Phallus (fig. E) - conjunctiva with short

dorsal sac, apical lobes of the latter (b) short and wide; conjunctiva armed with the following processes: 4a-b membranous and bulging; 9a-b heavily sclerotized, wide, large, flat and straight, terminating in a blunt tip; 8a-b heavily sclerotized each with two anterior projections, the external one tapering to form a long pointed tip, the internal one blunt and membranous; 7a-b membranous, not very conspicuous; 5a (fig. E,F) heavily sclerotized, slender and tapering distally, with two elongate convolutions.

Female genitalia: Ist gonocoxa, VIIIth laterotergite and spermatheca as shown in figs. G and H respectively.

Measurements and Ratios: (see table 31).

Geographical distribution: (Map 11) Only recorded from Mexico.

Material examined.

a) Type material: Lectotype ♂ of Theognis lineosus Stål from Mexico, Sallé in NR collection.

2 ♀ syntypes, same data as the lectotype, (NR).

b) Other material: MEXICO: Oaxaca, 3 ♂, 1 ♀ (BMNH). M. Sallé, 1 ♂, 1 ♀ (BMNH); Tepic, Schuman, 1 ♀ (BMNH); 1 ♀ (NMHU); 1895, G. Fallow, s ♀ (MNHN); Signoret Coll. 2 ♂ (NM).

Plate 32

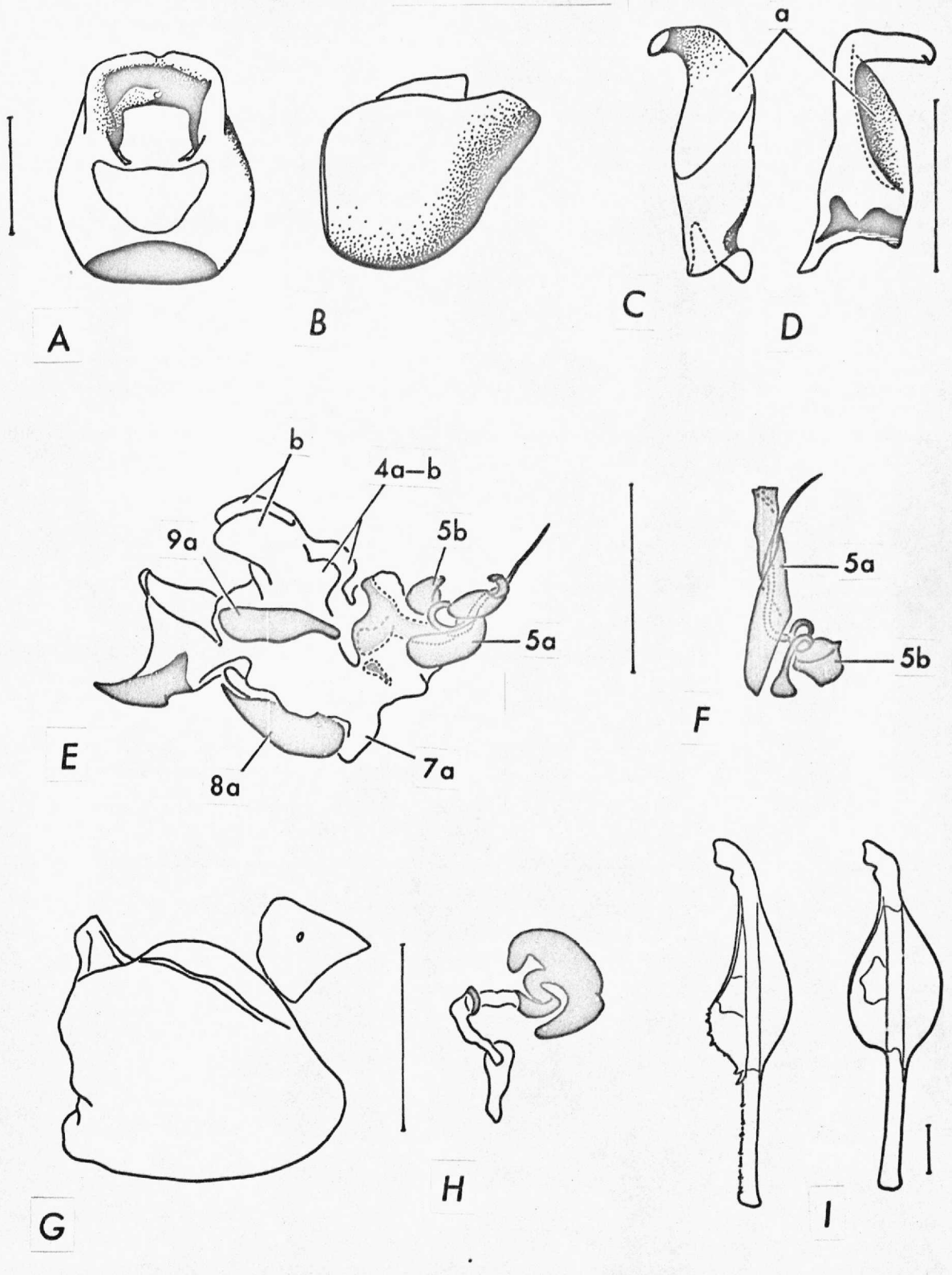


Table 31 Measurements (5 ♂♂ and 3 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.6–18.0	17.3	3	16.8–18.0	17.4
2 Head length	5	2.45–2.58	2.52	3	2.51–2.56	2.52
3 " width	5	2.01–2.12	2.05	3	2.03–2.10	2.07
Distance:						
4 inter-ocular	5	1.04–1.17	1.07	3	1.04–1.12	1.08
5 ante-ocular	5	1.15–1.19	1.16	3	1.23–1.29	1.25
Antennae:						
6 segm. I length	5	2.40–2.85	2.69	3	2.24–2.43	2.32
7 " II "	5	3.74–4.32	4.04	3	3.50–3.93	3.72
8 " III "	5	2.40–2.88	2.57	3	2.54–2.68	2.62
9 " IV "	3	3.36–3.60	3.50	3	3.21–3.31	3.26
Labium:						
10 segm. I length	5	2.28–2.39	2.34	3	2.28–2.47	2.37
11 " II "	5	2.47–2.52	2.49	3	2.47–2.62	2.55
12 " III "	5	0.85–1.14	0.97	3	0.98–1.10	1.02
13 " IV "	5	2.47–2.75	2.61	3	2.60–3.02	2.77
14 Pronotum length	5	2.88–3.36	2.99	3	2.68–2.97	2.85
15 " width	4	5.32–6.14	5.64	3	5.61–6.05	5.85
16 Scutellum length	5	1.90	1.90	3	1.90–1.95	1.92
17 " width	5	1.93–2.09	2.00	3	2.09–2.18	2.15
18 Hind tibia length	4	7.44–8.59	7.89	3	7.05–7.68	7.40
Tibial dilation:						
19 total width	4	1.72–1.96	1.78	3	1.82–1.96	1.90
external part:						
20 length	4	3.36–4.08	3.71	3	3.36–3.60	3.52
21 width	4	0.62–0.76	0.69	3	0.76–0.84	0.81
internal part:						
22 length	4	2.88–3.36	3.00	3	2.88–3.26	3.10
23 width	4	0.62–0.76	0.65	3	0.70–0.84	0.74
24 Undilated portion	4	2.16–3.31	2.79	3	2.59–2.88	2.75
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.61–7.03:1	6.86:1	3	6.69–7.03:1	6.90:1
1 / 18	5	2.09–2.23:1	2.19:1	3	2.33–2.38:1	2.35:1
2 / 3	5	1.21–1.24:1	1.22:1	3	1.20–1.23:1	1.21:1
6 / 2	5	0.95–1.14:1	1.06:1	3	0.89–0.94:1	0.92:1
10 / 2	5	0.90–0.96:1	0.92:1	3	0.89–0.98:1	0.94:1
9 / 6	3	1.19–1.30:1	1.25:1	3	1.34–1.44:1	1.40:1
15 / 16	4	2.80–3.23:1	2.96:1	3	2.93–3.18:1	3.04:1
20 / 18 %	4	45.1–49.0	47.0	3	46.8–47.6	47.5
22 / 18 %	4	36.3–39.1	38.0	3	40.8–43.5	41.8

Theognis subauratus (Distant) 1881 comb.n.

(Plate 33)

Leptoglossus subauratus Distant 1881: 126.8, pl. 12, fig. 18.

LECTOTYPE ♀, Guatemala (BMNH), here designated [examined].

Leptoglossus subauratus Distant: Lethierry & Severin, 1894: 49; Allen, 1869: 75.

General and differential diagnosis: In addition to the characters mentionedby Allen (1969: 76), the following are characteristic of ♂♂: shape and size of genital capsule and parameres, shape and size of apical lobes (b) of dorsal sac, shape of processes 4a-b, 9a-b and 5a. Those of ♀♀: shape of Ist gonocoxa and size of basal part of spermatheca. Ratios: head length/head width = 1.31 - 1.45:1 (1.41:1); body length/ head length = 5.44 - 6.18:1 (5.90:1).

Description: General characters see Allen, 1969: 75.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly curved and slightly below the level of lateral margins; the latter somewhat horizontal, slightly elevated posteriorly. Paramere (fig. C,D) - internal margin of shaft sinuous, external margin not expanded; shank flat and pointed, gradually tapering distally. Phallus (fig. E) - conjunctiva with long dorsal sac, apical lobes of the latter (b) rather long and narrow,

well separated and diverging; conjunctiva armed with the following processes: 4a-b if present moderately sclerotized apically, flat and wide; 9a-b heavily sclerotized, long and gradually tapering anteriorly, flat and slightly curved; 8a-b heavily sclerotized and wide, each with two anterior projections, the external one rapidly tapering to form a rather short tip, the internal one dorsally directed, heavily sclerotized and subacute; 7a-b membranous and small, 5a (fig. E,F) heavily sclerotized, slender, tapering distally with two elongate convolutions.

Female genitalia: Ist gonocoxa, VIIIth laterotergite and spermatheca as shown in figs. G and H respectively.

Measurements and Ratios: (see table 32)

Geographical distribution: (Map 11) Only known from Central America, the material available for study was collected in: Mexico, Guatemala, Honduras, El Salvador, Nicaragua and Costa Rica.

Habitat and Biology: T. subauratus has been recorded on prickly pear in Guatemala and El Salvador (Mann, 1969).

Discussion: The most important variations observed in the examined material were as follows: a male from Costa Rica was darker than any of the other specimens examined, specially the thorax and abdomen where all the usually dark brown areas were black; the patch on middle part of disc was comparatively narrow. According to Allen the aedeagus has no proximal lobes (= processes 4a-b), but these may be present or absent. When present they are small, flat and moderately sclerotized; this condition

was observed in a male from Costa Rica. When absent the corresponding area still shows slight sclerotizations; this condition was observed in a male from Salvador, Nicaragua. In my opinion the similarity of the genitalia of T. subauratus and T. lineosus has been exaggerated by Allen and resulted in his suggestion that these two species may be conspecific. As here described the character of genitalia are sufficiently different to consider the species as distinct.

Material examined.

a) Type material: Leptoglossus subauratus Distant, 2 ♀♀ syntypes: one of these labelled "Type, Guatemala, Capetillo, G.C. Champion", in the BMNH, was designated and labelled as lectotype; the other one labelled "Nicaragua, Chontales" in the BMNH was designated as paralectotype.

b) Other material: COSTA RICA: Coyolar, 16 - IX - 1934, C.H. Ballou, 1 ♂ (IZA). GUATEMALA: 1908, R. Guerin, 1 ♀, (MNHN); Angrand, 1 ♂ (MNHN); Antigua, 26 - XI - 1927, E. Mortensen, 1 ♂ on Opuntia sp (USNM). HONDURAS: Coll. Breddin, 1 ♀ (DEI). MEXICO: 1 ♂ (MNHN); 1 ♂ (NM). NICARAGUA: Matagalpa, 5 - XII - 1951, 1 ♂ on Cereus sp (USNM). EL SALVADOR: La Unión, 6 - XII - 1927, E. Mortensen, 1 ♂ on Opuntia sp (USNM); Acajutla, F. Knab, 2 ♀ (USNM).

Plate 33

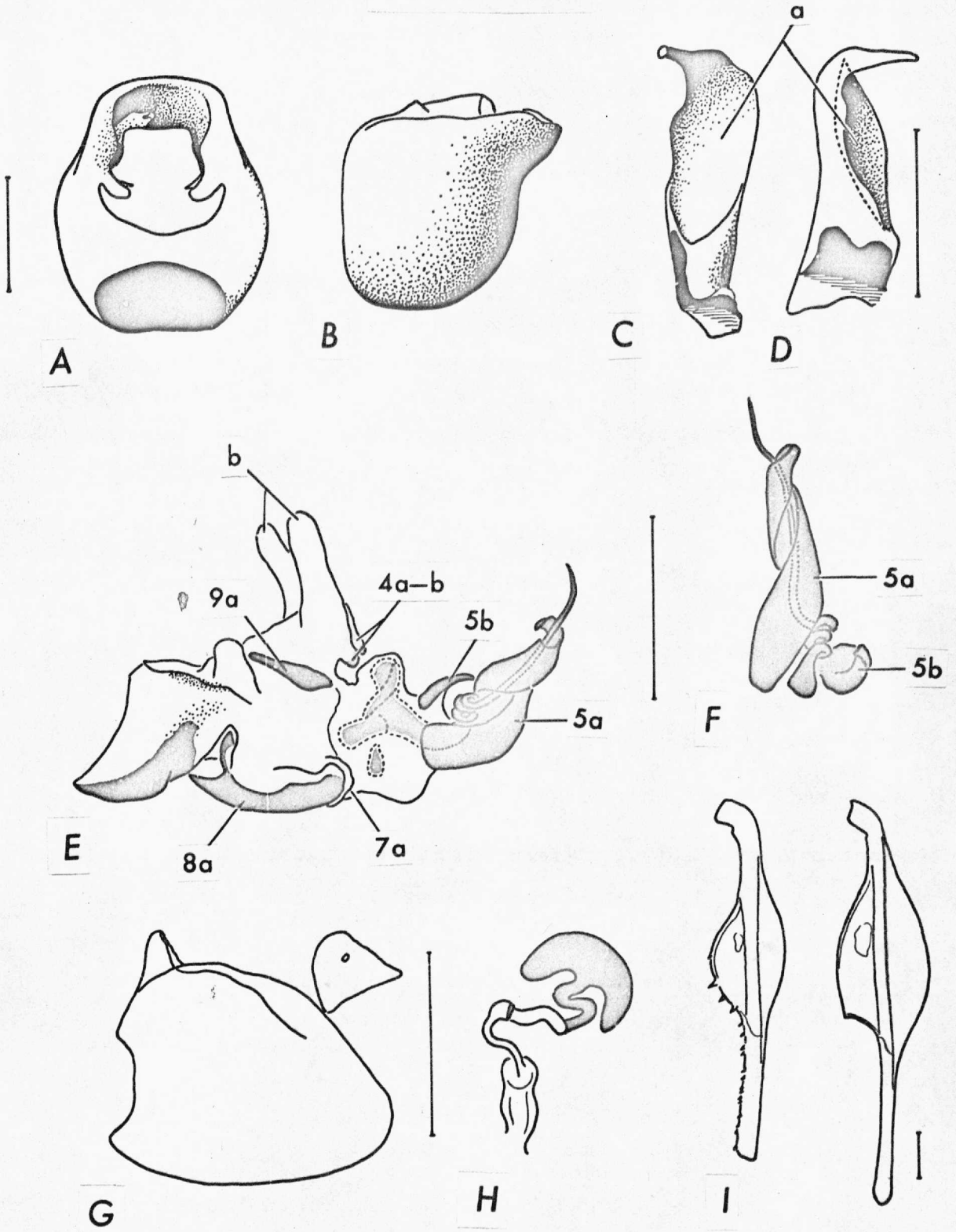


Table 32 Measurements (5 ♂♂ and 4 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.0–17.2	16.7	4	15.6–17.3	16.5
2 Head length	5	2.75–2.94	2.83	4	2.66–2.96	2.85
3 " width	5	2.05–2.09	2.06	4	1.91–2.05	2.01
Distance:						
4 inter-ocular	5	1.14	1.14	4	1.14	1.14
5 ante-ocular	5	1.34–1.38	1.37	4	1.33–1.44	1.40
Antennae:						
6 segm. I length	5	2.28–2.66	2.45	3	2.28–2.47	2.40
7 " II "	4	4.46–4.80	4.61	1	4.46	4.46
8 " III "	4	2.88–2.97	2.91	1	3.07	3.07
9 " IV "	2	3.31–3.60	3.45	1	3.45	3.45
Labium:						
10 segm. I length	5	2.66–2.77	2.70	4	2.50–3.04	2.86
11 " II "	5	2.66–2.96	2.87	4	2.66–3.23	2.98
12 " III "	5	1.23–1.42	1.30	4	1.19–1.42	1.33
13 " IV "	5	3.38–3.70	3.51	4	3.23–3.99	3.63
14 Pronotum length	5	2.73–3.12	2.86	4	2.49–3.02	2.83
15 " width	4	5.42–5.80	5.58	4	4.99–6.00	5.31
16 Scutellum length	5	1.95–2.31	2.08	4	1.74–2.18	1.97
17 " width	5	2.09–2.18	2.12	4	1.82–2.18	2.01
18 Hind tibia length	5	7.87–8.73	8.37	3	7.92–8.64	8.20
Tibial dilation:						
19 total width	5	1.53–1.82	1.69	3	1.87–2.20	2.02
external part:						
20 length	5	3.36–4.22	3.82	3	3.50–4.12	3.82
21 width	5	0.48–0.68	0.56	3	0.68–1.44	0.97
internal part:						
22 length	5	2.30–3.84	2.86	3	3.12–3.36	3.28
23 width	5	0.48–0.72	0.58	3	0.76–0.84	0.78
24 Undilated portion	5	3.07–3.36	3.22	3	3.12–3.26	3.18
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.44–6.18:1	5.90:1	4	5.57–6.00:1	5.76:1
1 / 18	5	1.89–2.16:1	1.99:1	3	2.00–2.13:1	2.01:1
2 / 3	5	1.31–1.41:1	1.37:1	4	1.39–1.45:1	1.41:1
6 / 2	5	0.80–0.93:1	0.86:1	3	0.83–0.85:1	0.84:1
10 / 2	5	0.90–1.00:1	0.95:1	4	0.95–1.02:1	1.00:1
9 / 6	2	1.39–1.45:1	1.42:1	1	1.39:1	1.39:1
15 / 16	4	2.34–2.87:1	2.68:1	4	2.57–2.86:1	2.69:1
20 / 18 %	5	42.6–48.3	45.6	4	44.1–47.6	46.5
22 / 18 %	5	27.3–47.9	34.1	4	38.8–41.6	40.0

Theognis lanceatus sp.n

(Plate 34)

General and differential diagnosis: Pronotum without transverse yellow ochre band or patch; humeral angles produced into long lanceolate processes; postero lateral margin tuberculate; hind tibial dilation subcircular. Characteristic features of ♂♂: shape and size of genital capsule and parameres, shape and size of special lobes (b) of dorsal sac, shape of processes 4a-b, 9a-b, 8a-b and 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

Description: Head. Basically yellow ochre with two stripes on dorsal surface, a band behind the eye, and a band on genae and on gula, brown to dark brown. Labium yellow ochre, the posterior surface occasionally with brownish patches, IVth segment with dark brown to black tip. All antennal segments cinnamon to yellow ochre; external surfaces of segments I to III, sometimes patches on the internal surface, and the distal part of the IVth segment, brown. Tylus deflected, not projecting anteriorly, slightly elevated between juga; the latter short, with rounded tip, straight internal margin. Labium not reaching beyond the anterior margin of IIIrd sternite. Thorax. Pronotum, scutellum and corium brown, with the following yellowish white markings: On pronotum - all margins of pronotum, tubercles on median part of calli, and the median narrow

longitudinal band extending from collar to posterior margin of pronotum. On scutellum - median longitudinal line. On corium - costal margin, boundary between corium and membrane, transverse band across the corium, distal part of vein R, M and Cu, vein Pcu and cross vein m-cu. Pleural region basically yellow ochre with irregular dark brown patches and spots and three longitudinal narrow bands extending over pro, meso and metapleura; the dorsal band slightly curved, the middle band oblique, and the ventral band in line with the supracoxal lobes of each leg. Sternal area dark brown to black. All legs cinnamon to yellow ochre, irregularly marked with brown patches, femur in males almost entirely brown; tibial dilation dark brown with two yellowish white irregular patches. Pronotal calli slightly elevated anteriorly, pronotum, scutellum and corium with numerous deep punctations; lateral margins straight, irregularly tuberculated, with a prominent tubercle at the level of collar; pronotal disk with median longitudinal carina; humeral areas slightly ascending; humeral angles sharply produced into a long ascending lanceolate processes; postero lateral margins tuberculate; posterior margin straight. Femur of males strongly incrassate with stout spines on ventral surface, and small spines on dorsal and lateral surfaces; femur of females narrow with comparatively small spines on ventral side; hind tibial dilation (fig. I) somewhat rounded, extending over 41% (2/5th) of the length of tibia. Abdomen. Tergites brown to dark brown, anterior part of each connexival segment yellow ochre. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males brown with some pale brown areas near lateral margins.

Male genitalia: Genital capsule (fig. A,B) - posterior margin somewhat concave, with wide shallow notch, and slightly below the lateral margins; the latter slightly concave. Paramere (fig. C,D) - internal margin of shaft slightly convex, external margin expanded distally; shank flat tapering distally but comparatively wide. Phallus (fig. E) - conjunctiva with short dorsal sac, apical lobes of the latter (b) somewhat elongate and bulging, well separated at base; conjunctiva armed with the following processes: 4a-b membranous, small, flat and wide; 9a-b moderately sclerotized, distal half gradually tapering, flat and slightly curved; 8a-b moderately sclerotized, each with two anterior projections, the external one tapering to form a narrow pointed tip, the internal one moderately sclerotized and blunt; 7a-b membranous, not very conspicuous; 5a (fig. E,F) moderately sclerotized, slender, tapering distally, with two elongate convolutions.

Female genitalia: Ist gonocoxa, VIIIth laterotergite and spermatheca as shown in figs. G and H respectively.

Measurements and Ratios: (see table 33)

Geographical distribution: (Map 11) Only known from the type locality Panama.

Material examined.

a) Type material: Holotype ♂ of Theognis lanceatus from Panama, Changuinola Bocas, 17 - IV - 1917, C.B. Williams in BMNH. Paratypes: PANAMA: same data as the holotype 1 ♂, 5 ♀ (Allotype) (BMNH).

Plate 34

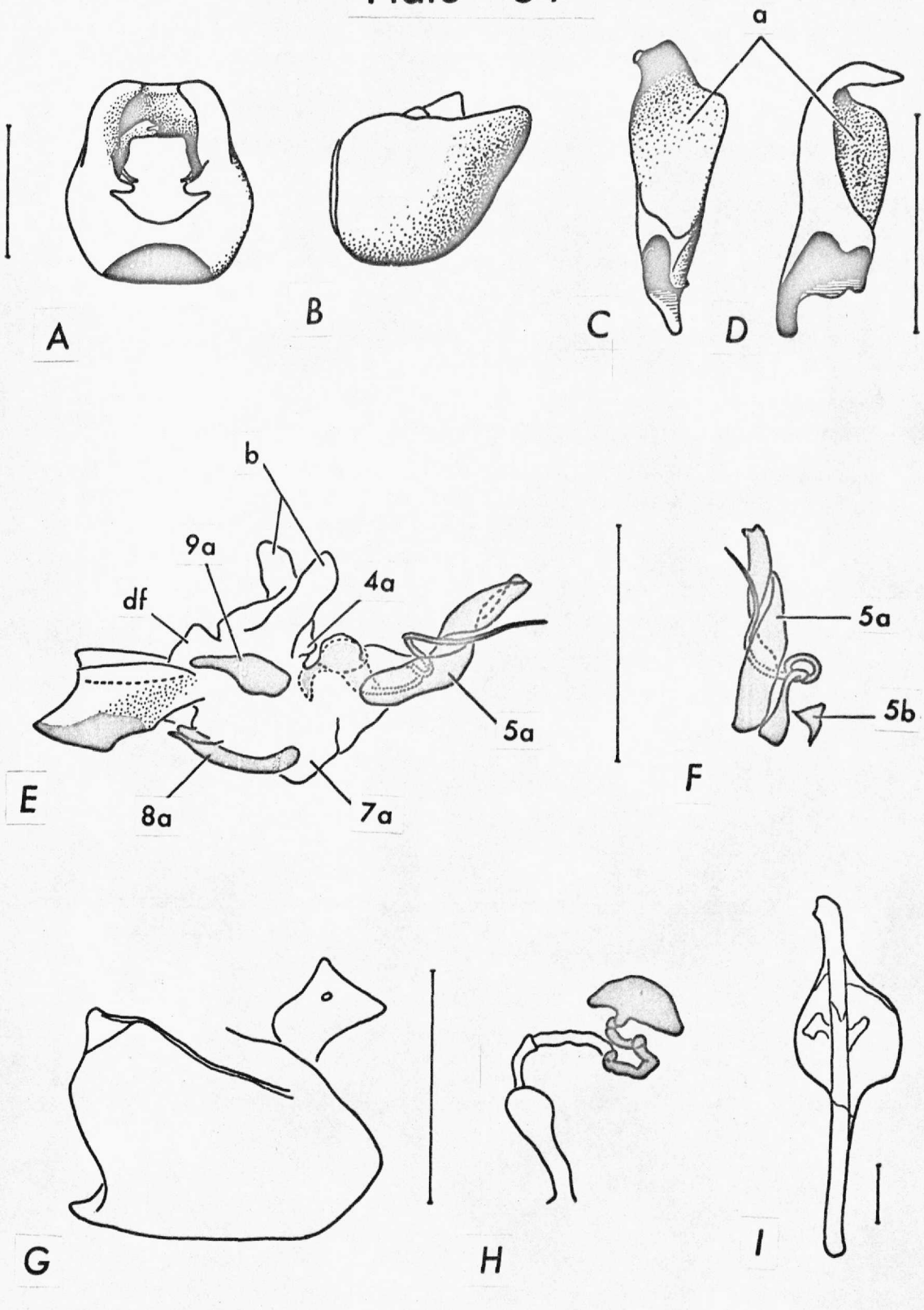


Table 33 Measurements (2 ♂♂ and 5 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	2	11.0–12.0	11.5	5	13.0–14.0	13.3
2 Head length	2	1.95–2.18	2.06	5	2.09–2.43	2.24
3 " width	2	1.71–1.82	1.76	5	1.76–1.88	1.84
Distance:						
4 inter-ocular	2	0.91–0.95	0.93	5	0.95–1.00	0.96
5 ante-ocular	2	0.95–1.04	0.99	5	1.04–1.10	1.07
Antennae:						
6 segm. I length	2	2.39–2.66	2.52	5	2.28–2.43	2.34
7 " II "	2	3.16–3.36	3.26	5	3.16–3.36	3.28
8 " III "	2	2.16–2.49	2.32	5	2.20–2.64	2.41
9 " IV "	2	3.50–3.88	3.69	3	3.50–3.69	3.61
Labium:						
10 segm. I length	2	1.50–1.55	1.52	5	1.69–1.78	1.72
11 " II "	2	1.61–1.71	1.66	5	1.71–1.86	1.79
12 " III "	2	0.64–0.66	0.65	5	0.60–0.72	0.65
13 " IV "	2	1.53–1.55	1.54	5	1.57–1.82	1.70
14 Pronotum length	2	2.16–2.25	2.20	5	2.40–2.54	2.45
15 " width	1	5.37	5.37	5	5.08–5.80	5.44
16 Scutellum length	2	1.29–1.59	1.44	3	1.42–1.55	1.50
17 " width	2	1.33	1.33	3	1.36–1.55	1.48
18 Hind tibia length	2	5.90–6.52	6.21	5	6.05–6.86	6.29
Tibial dilation:						
19 total width	2	1.44–1.68	1.56	5	1.72–1.96	1.77
external part:						
20 length	2	2.30–2.88	2.59	5	2.40–2.92	2.60
21 width	2	0.68–0.84	0.76	5	0.80–0.96	0.86
internal part:						
22 length	2	1.72–1.92	1.82	5	1.92–2.40	2.18
23 width	2	0.48–0.52	0.50	5	0.52–0.62	0.56
24 Undilated portion	2	2.49–2.54	2.51	5	2.40	2.40
Ratios: (figures refer to character numbers above).						
1 / 2	2	5.50–5.64:1	5.58:1	5	5.75–6.50:1	5.93:1
1 / 18	2	1.84–1.86:1	1.85:1	5	2.04–2.18:1	2.11:1
2 / 3	2	1.14–1.19:1	1.17:1	5	1.11–1.29:1	1.21:1
6 / 2	2	1.22:1	1.22:1	5	1.00–1.12:1	1.04:1
10 / 2	2	0.71–0.76:1	0.73:1	5	0.75–0.82:1	0.76:1
9 / 6	2	1.45–1.46:1	1.46:1	3	1.51–1.53:1	1.52:1
15 / 16	1	3.37:1	3.37:1	3	3.45–3.74:1	3.59:1
20 / 18 %	2	38.9–44.1	41.7	5	39.6–44.4	41.3
22 / 18 %	2	29.1–29.4	29.3	5	31.7–36.3	34.6

FABRICTILIS gen.n

(Plate 35)

Type-species: Cimex gonagra Fabricius

Diagnosis: Species of medium size and robust. Head. Basically dark brown to black with yellow ochre to brownish stripes and bands; all segments of antenna dark brown to black, with yellow ochre areas on median part of IInd and IIIrd segments, and on distal $\frac{2}{3}$ of the IVth segment. Slightly declivent, depressed behind ocelli; tylus and juga level with antenniferous tubercles; ratio length of head to inter-ocular distance = 2.05 - 2.52:1 (2.39:1); Ist antennal segment either longer or shorter than head; labium variable in length, from short reaching only the posterior margin of IInd to long extending up to the posterior margin of the Vth sternite. Thorax. Basically dark brown to black, with the following yellow ochre to yellow orange markings: transverse narrow arcuate band on pronotum extending from one lateral margin to the other, a spot on median part of posterior margin of pronotum, the apex and basal portion of margins of scutellum, a small spot on cross vein m-cu and several patches of different shapes and sizes on pleural and sometimes also on sternal regions. Pronotum gradually declivent, and slightly punctated; calli not elevated, the area between calli slightly higher and with different sculpture from the disk; the latter with a median

longitudinal, distinct but not elevated line; humeral areas level with dorsal surface of disk; humeral angles usually raised long and spinose, sometimes level or deflected and obtuse; postero-lateral margins serrate or irregularly dentate; posterior margin straight and slightly depressed beyond the transverse ridge of the disk. Scutellum longer than wide, very occasionally as long as wide; transversely rugulose, flat, sometimes with a median transverse depression; marginal ridges distinct only at its distal half. Hind coxae, particularly in males, broader and more conspicuous than in the fore and middle legs. Hind tibia (fig. I1, I2, I3) with lanceolate or foliaceous dilation of variable length and width, usually with emarginations. Abdomen. Black, with two yellow spots on and around the scent gland scars, or the latter pale yellowish white, occasionally slightly darker; anterior margin of connexivum of segments III to VII yellow ochre to yellow orange; sternites brown to black, with several large yellow ochre to reddish orange patches over the whole of the ventral surface, occasionally the patches smaller and irregular.

Male genitalia: Genital capsule (fig. A,B) - without subproctigeral sac; posterior margin with deep, rounded, occasionally "V" shaped median notch; dorsal prongs absent; lateral margins flared. Paramere (fig. C,D) - tapering distally without distal cavity, shank short without median lobe, terminating in a strongly curved hook. Phallus (fig. E) - phallotheca slightly sclerotized laterally, conjunctiva with a very long and tapering dorsal sac, and armed with the following processes: 3a-b, 9a-b, 8a-b, 7a-b, 12a-b, 11c, 6a, 10a and 5a.

Female genitalia: Spermatheca (fig. H) very reduced with short duct dilation; spermathecal bulb with lateral projections.

Pubescence: Body comparatively bare, with some very thin short hairs on pleura and on sternites, and some thin but slightly longer hairs on calli and on lateral margins of pronotum.

Geographical distribution: (Maps 12-13) This genus is present on both hemispheres, occurring in all circuntropical regions, and extending to the subtropical regions of Neartic, Neotropical, Ethiopian, Oriental and Australian regions. F. gonagra is restricted to the western hemisphere and F. australis to the eastern, both species having a similar spreading potential; F. gonagra has the widest distribution in America, ranging from Virginia (U.S.A.) to the northern part of Argentina and has been reported also from most of the Antilles; F. australis has extremely wide distribution range, from the Cape Verde Is. in the Atlantic ocean across Africa, south east Asia and Australia to Tahiti in the South Pacific, and from Morocco to South Africa in the Ethiopian region and from Taiwan (Formosa) to New South Wales (Australia) in the Oriental and Australian regions.

Discussion: These two species have been formerly included in the genus Leptoglossus sens. lat., but Allen (1969) separated them as the australis group of Leptoglossus spp. The status of this group is here raised to the generic rank, Fabrictilis gen.n for gonagra and australis as the two included species, with australis represented by two subspecies. Fabrictilis is characterized, and differs from the other genera of the

Leptoglossus group of genera by: body dark brown to black with the following yellow ochre to yellow orange markings: transverse band on pronotum; a series of six small spots, two on the median part of posterior margin of pronotum, one each at the bases of lateral margins of scutellum, and one on the cross vein m-cu of each wing; numerous patches on pleural region and sternites and on genital segments. Pronotum with a median longitudinal distinct area, humeral angles raised, long and spinose; hind coxae particularly in males, rather broader and more conspicuous than the fore and middle ones; tibial dilation lanceolate, usually with deep emarginations; paramere suddenly tapering distally, with oblique dorsal carina; dorsal sac of conjunctiva very long tapering distally and armed with processes 3a-b, 9a-b, 8a-b, 7a-b, 11c, 6a, 10a and 5a; the shape of these processes as described for F. gonagra; spermatheca as illustrated (pl. 35, fig. H). The genus is named in honour of J.C. Fabricius.

KEY TO SPECIES AND SUBSPECIES

1 Tibial dilation extending over 82 - 85% about 7/8th of the length of tibia; two yellow spots on scent gland scars of abdomen.....gonagra (p.313)

\- Tibial dilation shorter (extending over less than 70%, 11/16th of the length of tibia); without yellow spots on scent gland scars.....australis (p.324)

1a Tibial dilation long (about 68%, 11/16th, and wide, with deep emarginations and acute projections; humeral angles of

pronotum long and spinose.....
.....australis membranaceus (p.328)

- Tibial dilation short (about 59%, $\frac{5}{8}$) and narrow, sometimes with shallow emarginations and small spines; humeral angles obtuse ..... australis australis (p.327)

Fabrictilis gonagra (Fabricius), 1775 comb.n

(Plate 35)

Cimex gonagra Fabricius, 1775: 708.57. Holotype ♀, St. Thomas (UZM) [examined].

Cimex gonagra Fabricius: Goeze, 1778: 241.23; Fabricius, 1781: 352.82; 1787: 289.101; Gmelin, 1789: 2143.236.

Cimex grallator Herbst, 1784: 259.12. Holotype Surinam (lost). [Synonymized by Stål, 1870: 165].

Lygaeus gonagra (Fabricius): Fabricius, 1794: 140.19; 1803:210.27.

Anisoscelis antica Herrich-Schaeffer, 1835: 92. Holotype ♀, Brasil (lost). [Synonymized by Stål, 1870: 165].

Anisoscelis antica Herrich-Schaeffer: Dallas 1852: 453.7; Walker, 1871: 125.8.

Anisoscelis gonagra (Fabricius): Burmeister, 1839: 332.4; Westwood, 1842: 16; Dallas, 1842: 453.6; Guérin-Méneville, 1857: 387; Walker, 1871: 125.6.

Theognis gonagra (Fabricius): Stål 1862: 295.152.

Theognis gonager (Fabricius): Mayr, 1866: 103.

Leptoglossus gonagra (Fabricius): Stål, 1868:51.1; 1870: 165.7; Berg, 1879: 72.89; Distant, 1881: 126.9; 19016: 417; Lethierry & Severin, 1894: 47; Van Duzee, 1917: 89; Gibson, 1917: 72; Blatchley, 1926: 224; Barber, 1939: 310; Torre-Bueno, 1941: 40⅞ Froeschner, 1942:594.599; Barber and Bruner, 1947: 80; Hussey, 1953: 31; Allen 1969:84.

Anisoscelis praecipua Walker, 1871:128. LECTOTYPE ♂ Mexico (BMNH), here designated [examined].

Anissocelis praecipua Walker: Distant, 1901: 431.

Leptoglossus praecipus (Walker): Lethierry & Severin, 1894: 48.

Leptoglossus gonager (Fabricius): Blöte, 1936: 28.

General and differential diagnosis: Body light brown to chocolate brown, yellow spots on scent gland scars of abdomen, tibial dilation extending over 82.2 to 85.2% of the length of tibia (fig. I_1).

For relationships between F. gonagra and F. australis see Allen (1969).

Description: General characters see Blatchley, 1926: 224; Allen, 1969: 84.

Male genitalia: Genital capsule (fig. A,B) - posterior margin below the level of lateral margins, with a deep rounded median notch, lateral margins ascending and projecting posteriorly. Paramere (fig. C,D) - shaft suddenly tapering distally, with a dorsal oblique transverse carina, continuous with the medial margin of the shank; the latter short; hook strongly curved. Phallus (fig. E) - conjunctiva with a very long and

tapering dorsal sac, and armed with the following processes: 3a-b membranous, small and flat; 9a-b heavily sclerotized, flat and wide, projecting anteriorly into a conspicuous acute tip; 8a-b heavily sclerotized, very conspicuous; 7a-b conspicuous, membranous, projecting laterally in a rugose lobe; 11c small and membranous; 6a membranous; 10a membranous, projecting postero-laterally; 5a heavily sclerotized, short, with two convolutions, the IInd convolution laterally concave and shorter than the Ist.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) very much reduced, with both dilated portion of the duct and the base comparatively wide, and distal part of spermathecal duct joined laterally to the duct dilation.

Measurements and Ratios: (see table 34).

Geographical distribution: (Map 12) Distributed almost over the whole of Neotropical region; collected from most of South America, Central America and Antilles; in the north the range extends also to the Neartic region as far as Virginia (U.S.A.). This species is very common in most parts of its distribution range, except the zone of tropical rain forest where it appears to be rare (few records available).

Habitat and Biology: Collection data of the available material would indicate that the adults are present during the whole year without significant variation in their frequency and occur at the altitude between 100 and 1000m. During the dissections two females were found with

developed eggs, one from Venezuela collected in September and the other from Grant Cayman Is., collected in July; the eggs are subcylindrical, length = 1.57mm, width = 1.23mm, height = 0.95mm. F. gonagra has been reported as pest of various crops (see Alleh, 1969: 84); in Surinam it has been reported by several collectors as feeding on Momordica charantia (L.); in Venezuela it was reported on Manihot esculenta, sugar cane, cotton, guava (Psidium sp), and Luffa sp.; the other reports inclued: Tomato and Phaseolus sp. in St. Vincent Is. (Hutson, 1918); Guava (Psidium sp.) in St. Vincent Is. (H.A. Ballou), Trinidad and Haiti (U,S. Dep. Agric. 1933).

Discussion: The most important variations observed in the available material were: the brown stripes on dorsal surface of the head anterior to the ocelli, may vary individually in shape and size, occasionally some of them might be absent, humeral angles of pronotum may vary from long and spinose to obtuse; two males were observed with a dorsal sac of conjunctiva shorter than that illustrated in fig. E.

Material examined.

a) Type material: Holotype ♀ of Cimex gonagra Fabricius from St. Thomas, West Indies, in UZM (Kiel Coll.) labelled "in Insula St. Thomas Americae, Mus. Tottianum". Anisoscelis praecipua Walker 2 ♂♂ syntypes: one from Mexico, volcano de Orizaba, M. Sallé, labelled "Type, 25 Anisoscelis praecipua, 56.143, Mex." was designated and labelled as lectotype, the other from Brasil, Amazonas, presented by W.W. Saunders, labelled "Anisoscelis praecipua var. Walker's catal., Amaz., Saunders, 65-13" was designated and labelled as paralectotype. Both types are in BMNH collection.

b) Other material: ANTILLES: St. Vincent Is., - X - 1912, H.A. Ballou, on Guaba Belmont, 1 ♂ (BMNH); Jamaica, 1899, C.B. Taylor, 1 ♀ (BMNH); Dominica Is., 1 ♀ (BMNH); Jamaica, St. Catherine, Old Harbour "the whin" Farm, 9 - X - 1957, F.H. Farr, 1 ♀ (BMNH); St. Vincent Is., A.K. Totton, 1 ♀ (BMNH); Nevis Is., 24 - 26 - II - 1931, R.H.S. Rodger, 1 ♀ (BMNH); Trinidad, 8 - IV - 1932, A.M. Gwynn, 1 ♀ (BMNH); Port of Spain, 3 - VIII - 1937, Richards, Smart, 1 ♀ (BMNH); Grand Cayman Is., West End of Georgetown, 25 - VII - 1938, C.B. Lewis, G.H. Thompson 1 ♀ (BMNH); Jamaica, St. Thomas, Lyssons, B.W.I., 15 - II - 1965, R.P. Bengry, 1 ♂ (BMNH); Puerto Rico: - XI - 1874, 2 ♂ (MNHU); Cuba: 1 ♀ (MNHU); Guasas, 8 - VII - 1933, H.J. MacGillary, 1 ♂ (RNH); St. Croix, 12 - IX - 1914, 6 ♂, 10 ♀ (UZM); Trinidad, penal, 27 - VII - 1929, D.C. Geyskes, 1 ♀ (RNH); Cuba: La Havana, 1909, P. Sarre, 1 ♂ (MNHN); Guantánamo, E. le Moult, 2 ♀ (RNH). ARGENTINA: Chaco, 5 - XI - 1897, C. Bruch, 1 ♂ (NM); Misiones El Dorado, - IV - 1936, on Citrus, 2 ♂, 1 ♀ (MLP); s.d., 1 ♂ (IZA); Misiones, 1 ♂, 1 ♀ (MLP). BOLIVIA: Coroico, 2 ♀ (ZMU); Chiquitos, Robore, 300m, 12 - XI - 1950, H. Ertl, 1 ♂ (ZSBS). BRASIL: Lagoa Santa, Reinhardt, 3 ♂ (UZM); 1 ♂, 1 ♀ (UZM); Rio de Janeiro, Cromelin, 1 ♂ (RNH); Sao Paulo, 1932, Staudinger, 1 ♂, 1 ♀ (RNH); 2 ♂, 4 ♀ (MNHN); 1895, G. Fallou, 1 ♀ (MNHN); Espiritu Santo, 1898, Moualhier, 1 ♀ (MNHN); Bahia, 1912, P. Serre, 2 ♂ (MNHN); Rio de Janeiro, 1909, Dupuy, 2 ♂, 1 ♀ (MNHN); Manaos, 7 - VII - 1963, G. Marlier, 2 ♀ (IRSNB); Bahia, 1928, G. Bondar, on Orange, 1 ♂ (BMNH); 1861, Bates, 1 ♀ (UM); Rio de Janeiro, 1 ♀ (UM); 1 ♂, 2 ♀ (ZSBS); Pará, 15 - II - 1937, Independ., 1 ♂ (ZSBS); Bahia, Fruhstorfer, 1 ♀ (DEI); Sta. Cruz, 1 ♂ (DEI); Santos, 1 ♀ (DEI): Mang.,

6 - V - 1916, R. Fischer, 1 ♂, 1 ♀ (DEI); Espiritu Santo, - X - 1920, - II - 1921, F. Hoffman, 1 ♂, 1 ♀ (DEI); Porto do Cadi, Esp. Santo, - III - 1921, s.c., 1 ♀ (DEI); Itatiaya, - III - VII - 1956, S. Rombe, 1 ♀ (ZMU); 1 ♀ (ZMU); Sao Paulo, Piracicaba, Bondar, 5 ♂, 2 ♀ (ZI); Matto Groso, Corumba, Stavdinger & Bang-Haas, 1 ♀ (ZI); Minas Geraes, K.K. Tyduwa, 1 ♀ (ZI); Prov. Goias, Jatai, 9 - XI - 1897, Clermont, 1 ♂ (ZI); Paraná, Salto Yguassu, 29 - 31 - IX - 1914, 1 ♀ (ZI); Pelotas, 24 - XI - 1949, Biezank, 1 ♀ (MN); Bahia, Fruhstorfer,1 ♂, 1 ♀ (NM); Schott, 1 ♂ (NM); Natterer, 1 ♀ (NM); Bahia, 1859, Felder, 2 ♀ (NM); 1 ♂, 1 ♀ (NM); Amazonas, Taperinha, Santarem, - IV - 1916, G. Hagmann, 1 ♂ (NM); Rio de Janeiro, - VIII - 1932, 1 ♀ (NM); Matto Grosso, mid., Cuiaba, C. Heller, 1 ♂ (MNHU); Santos, 1 ♂, 1 ♀ (MNHU); Sao Paulo, 1 ♂, 1 ♀ (MNHU); Bahia, 2 ♀ (MNHU); S. Paulo, 1 ♀ (NMP); Corcovado, Rio D.F., 7 - III - 1946, Wygodzinsky, 1 ♂ (NMP); Rio, - VI - 1942, s.c., 1 ♀ (NMP); Sao Paulo, 1 ♂ (TM); Sao Paulo, 3 ♂, 2 ♀ (NR); Minas Geaes, S. do Caoarao, 800-2000m, Lange-Larsson,1 ♂, 1 ♀ (NR); Monas Geraes, Salmin, 1 ♂, 1 ♀ (NR); Rio Grande do Sul, 1 ♂, 1 ♀ (NR); 1 ♂ (NR); 1 ♂ (IRSNB); Bahia, Lacerda, 1 ♀ (IRSNB); Campos Thobie, 1 ♀ (IRSNB); Santos, - VII - 1950, G. Basilewsky, 3 ♀ (IRSNB); Uberaba, Minas Geraes, E. le Moult, 1 ♂ (RNH); Mato Grosso, 1 ♂ (MLP); Rio Janeiro, 1901, 1 ♂ (MLP). BRITISH HONDURAS: River Sarstoon, Blancaneau, 1 ♀ (BMNH). COLOMBIA: 1 ♀ (MNHU); Palmira, 21 - VIII - 1959, J.G. Beeren, 1 ♀ (RNH); COSTA RICA: San José, 1 ♀ (DEI); Los Palmares, P. de Alajuela, 1 ♂ (TM);. FRENCH GUIANA: 1 ♀ (BMNH); 1899, R. Oberthur, 1 ♂, 1 ♀ (MNHN); Cayene, 2 ♀ (MNHN); s.l., F. Pillault, 1 ♂, 1 ♀ (IRSNB); s.l., Signoret,

1 ♂ (NM). GUATEMALA: 1 ♂ (DEI); San Gerónimo, Champion, 1 ♂, 1 ♀ (BMNH); San Isidro, s.c., 1 ♂ (BMNH); s.l., 480m, Champion, 1 ♀ (BMNH). GUYANA: Isororo, 7 - 1916, C.B. Williams, 1 ♂ (BMNH). HONDURAS: 1 ♂ (BMNH). MEXICO: Jacobsen, 1 ♂ (UZM); 1 ♂ (UZM); Sallé, 2 ♂ (NR); Temax, N. Yucatan, Gaumer, 1 ♂, 5 ♀ (BMNH); s.d., 1 ♀ (IRSNB); s.d., 2 ♂ (NR); s.d., 2 ♂ (TM); s.d., 1 ♀ (NM); Boucard, 2 ♂ (NR); Tabasco, Teapa, March, H.H. Smith, 1 ♀ (BMNH); Orizaba, - XII - 1887, s.c., F.D.G., 1 ♀ (BMNH); - II - 1883, Bilimek, 1 ♂, 1 ♀ (NM); 1867, Sichel, 2 ♀ (NM); Orizaba, 1869, Bilimek, 1 ♀ (NM); Signoret, 1 ♂, 2 ♀ (NM); Puebla, Tehuacan, 1903, L. Diguet, 2 ♂, 1 ♀ (MNMN); 1857, 2 ♂ (MNHN). PANAMA: Panama Bay, 1950-52, Galathea - Ex 1 ♂ (UZM). PARAGUAY: 1893, P. Jordan, 1 ♀ (NM); San Luis, Reimoser, 1 ♀ (NM); Molinus, - X - 1925, F. Schade, 2 ♂ (ZMU); 1 ♀ (TM); Vezenyi, 3 ♂, 1 ♀ (TM); Puerto Sajonia, 10 - VII - 1936, E. le Moult, 1 ♂, 1 ♀ (RNH); San Pedro, 1 ♀ (MLP). PERU: Valparaiso, 1 ♂ (MNHN). SURINAM: Paramaribo, 23 - XII - 1958, P.H. v. Doesburg, Jr., 1 ♂ (RNH); s.l., 24 - XI - 1958, s.c., 1 ♂, 3 ♀ (RNH); Wegn. Zee., 6 - VIII - 1962, s.c., 1 ♂ (RNH); Baboenhol, weg. n., Affobaka, 3 - VIII - 1965, G. Van Vreden, 2 ♀ (RNH); Paramaribo, Clevia, 23 - VI - 1958, P.H. v. Doesburg, Jr., on Momordica charatia (fruits) 1 ♂, 3 ♀ (RNH); s.l., 28 - VIII - 1958, Saginan, on Momordica charatia (fruits), 3 ♂, 1 ♀ (RNH); s.l., - IX - 1959, P.H. v. Doesburg Jr., 1 ♂, 1 ♀ (RNH); Paramaribo, 12 - VI - 1960, H.A. Van Hoof on Momordica charatia 1 ♀ (RNHL); s.l., 20 - IX - 1963, Geijskes, 1 ♂ (RNH); Zampery, 28 - I - 1964, D.C. Geijkes, 1 ♂ (RNH); Manlobbi, Zuvieraba, 28 - II - 1932, D.C. Geijkes, 1 ♀ (RNH); Paloemeu airstrip, - V - VII - 1961, Mohmin,

5 ♂, 8 ♀ (RNH); s.d., 1 ♂, 2 ♀ (IZA); Paramaribo, Fernandez Rd, 28 - VII - 1963, J.v.d. Vecht, 1 ♀ (RNH); Paramaribo, 14 - II - 1959, on Momordica charantia (L.) 1 ♂, 1 ♀ (RNH); s.l., 12 - VI - 1960, H.A. van Hoof, on Momordica charantia (L.), 1 ♀ (RNH); Paramaribo, Bot. Garden, 21 - XI - 1959, s.c., 1 ♀ (RNH); Paramaribo, 7 - V - 1959, P.H. v. Doesburg Jr., 1 ♀ (RNH); s.l., 27 - X - 1958, s.c., 1 ♀ (RNH); s.l., 24 - XI - 1958, s.c., 2 ♂, 2 ♀ (RNH); s.l., - VII - 1959, 1 ♂, 1 ♀ (RNH); Paloemeu, 17 - XI - 1965, G.F. Mees, 1 ♂ (RNH); Paramaribo, 27 - VII - 1963, Bruchhmicer 1 ♀ (RNH); Sancta Berna, 27 - VII - 1968, V. Vreden, 1 ♂, 1 ♀ (RNH); Paramaribo, Blauwgrond, 27 - III - 1963, J.v.d. Vecht, 1 ♀ (RNH), Paramaribo, 12 - X - 1964, D.C. Geijkes, 1 ♂ (RNH). URUGUAY: Montevideo, 1 ♀ (BMNH). U.S.A.: Florida, Broward Co., near Dania, 12 - VII - 1961, O.W. Richards, 1 ♂, 1 ♀ (BMNH); Virginia, 1 ♂ (RNH). VENEZUELA: Aragua: El Limón, 450m, 13 - V - 1966, L. Figueroa, 1 ♂ (IZA); Tocorón, 31 - VIII - 1946, R. Labrador, 1 ♂ (IZA); Carabobo: Central Tacarigua, 30 - IV - 1951, F. Fernández Yépez, 1 ♂ (IZA); Guárico: Mesa de Paya, 12 - V - 1955, J. Loggiodice, 1 ♂ (IZA); Mérida: 2 ♂, 2 ♀ (NR); Monagas: Jusepín, 14 - IX - 1965, P. Salazar, 1 ♂, 1 ♀ (IZA); s.l., 9 - IX - 1965, F. Fernández Yépez, C.J. Rosales, 2 ♂, 2 ♀ (IZA); Zulia: Kasmera, 19 - IX - 1961, F. Fernández Yépez, C.J. Rosales, 1 ♂ (IZA); Dist. Federa: Caracas, 8 - VII - 1965, F. Fernández Yépez, C.J. Rosales, 1 ♂ (IZA); s.l., 24 - VII - 1950, S. Sheri, 1 ♂ (IZA); El Valle, 28 - II - 1940, H. Ballou, on Luffa sp., 1 ♂ (IZA); Caracas, 1 ♂ (MNHU); La Guayra, Canuri Chico, 16 - VIII - 1949, P. Vogl, 1 ♂, 3 ♀ (ZSBS).

c) Material without data: 1 ♂, South America, 1852, Fontanier (MNHN); 1 ♂ (NM); 2 ♀ without locality, 1895, Fallou (MNHN); 1 ♂, 1 ♀, labelled "632/17" (TM); 2 ♂ (NM); 3 ♂, 4 ♀ (ZSBS); 1 ♂, 1895, G. Fallou (MNHN).

Plate 35

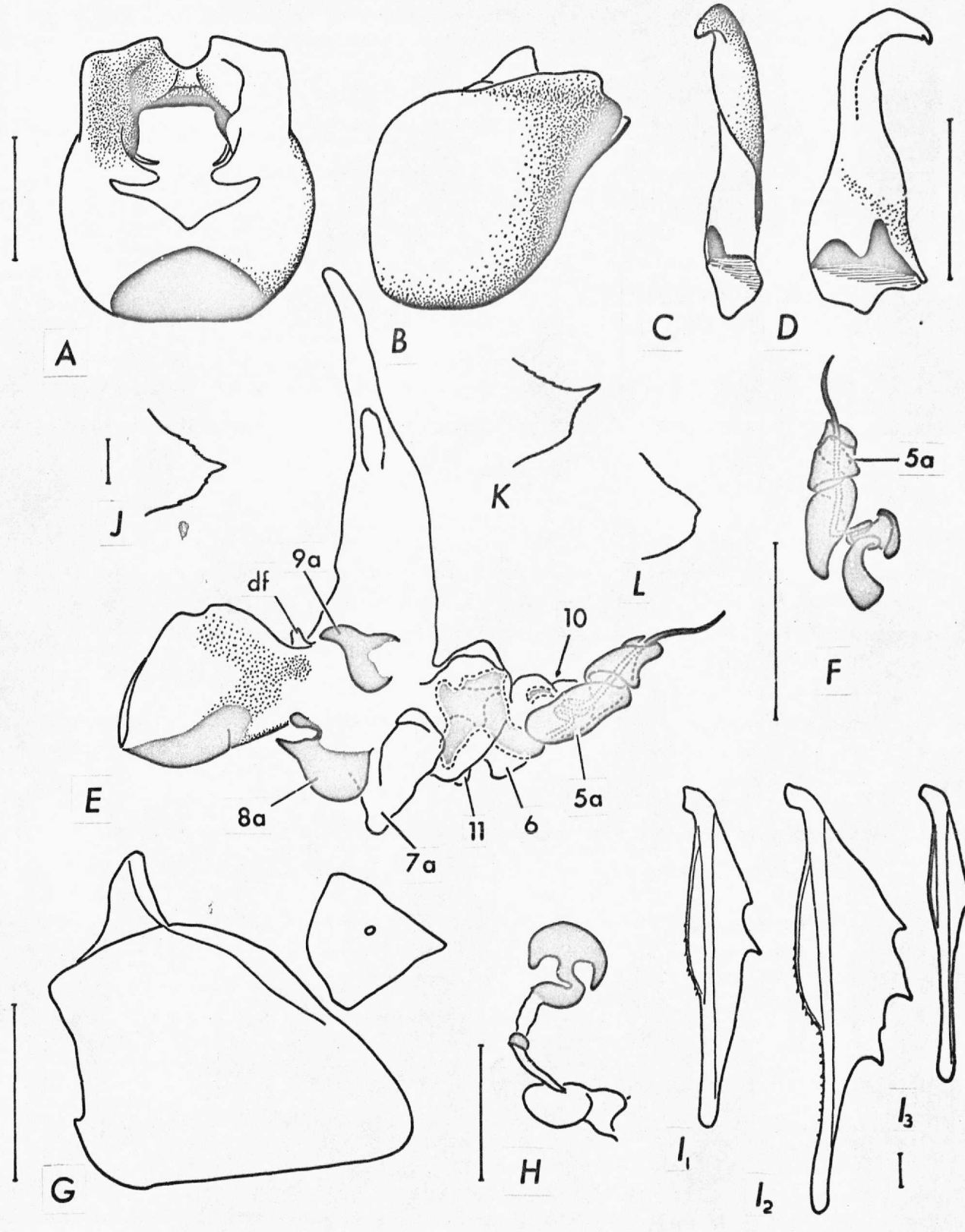


Table 34 Measurements (5 ♂♂ and 5 ♀♀ from 10 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.5–22.5	18.7	5	18.0–20.6	19.2
2 Head length	5	2.94–3.42	3.08	5	2.81–3.23	3.02
3 " width	5	2.29–2.75	2.47	5	2.43–2.52	2.49
Distance:						
4 inter-ocular	5	1.19–1.48	1.34	5	1.31–1.52	1.37
5 ante-ocular	5	1.38–1.63	1.47	5	1.46–1.57	1.52
Antennae:						
6 segm. I length	5	2.47–3.23	2.75	5	2.43–2.64	2.56
7 " II "	5	3.50–4.51	3.85	5	3.55–3.98	3.77
8 " III "	4	2.68–3.36	2.99	5	2.78–3.16	3.02
9 " IV "	3	3.88–4.32	4.12	5	3.79–4.12	3.96
Labium:						
10 segm. I length	5	2.31–2.85	2.51	5	2.47–2.81	2.65
11 " II "	5	2.28–2.66	2.46	5	2.47–2.85	2.64
12 " III "	5	1.33–1.71	1.44	5	1.52–1.61	1.54
13 " IV "	5	2.33–3.06	2.71	5	2.69–3.24	2.94
14 Pronotum length	5	3.12–4.17	3.52	5	3.36–3.64	3.48
15 " width	5	5.85–8.68	7.02	5	6.48–7.58	6.99
16 Scutellum length	5	2.18–2.86	2.37	5	2.28–2.62	2.46
17 " width	5	2.28–3.13	2.61	5	2.47–2.85	2.71
18 Hind tibia length	5	8.83–12.0	9.81	5	9.02–10.1	9.47
Tibial dilation:						
19 total width	5	1.72–2.54	2.03	5	2.20–2.40	2.35
external part:						
20 length	5	7.34–10.5	8.30	5	7.44–9.12	8.07
21 width	5	1.15–1.63	1.33	5	1.44–1.58	1.52
internal part:						
22 length	5	3.55–5.76	4.47	5	4.22–4.80	4.64
23 width	5	0.33–0.52	0.42	5	0.48–0.56	0.51
24 Undilated portion	5	0.68–0.96	0.81	5	0.72–0.90	0.85
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.50–6.57:1	6.07:1	5	5.92–6.66:1	6.35:1
1 / 18	5	1.82–2.01:1	1.90:1	5	1.93–2.08:1	2.02:1
2 / 3	5	1.16–1.31:1	1.24:1	5	1.13–1.28:1	1.21:1
6 / 2	5	0.83–0.94:1	0.89:1	5	0.79–0.93:1	0.84:1
10 / 2	5	0.78–0.83:1	0.81:1	5	0.82–0.94:1	0.87:1
9 / 6	5	1.06–1.50:1	1.07:1	5	0.95–1.23:1	1.10:1
15 / 16	5	2.68–3.15:1	2.96:1	5	2.64–2.92:1	2.84:1
20 / 18 %	5	82.2–88.0	84.6	5	82.4–90.2	85.2
22 / 18 %	5	40.2–53.8	47.2	5	45.0–49.2	47.2

Fabrictilis australis (Fabricius) 1775 comb.n

(Plate 35)

Cimex australis Fabricius, 1775: 709.58. LECTOTYPE ♂ Tahiti (Otaheite) (BMNH), here designated [examined].

Cimex australis Fabricius: Goeze, 1778: 241.24; Fabricius, 1781: 352.84; 1782: 289.103; Genelin, 1790: 2143.237.

Lygaeus australis (Fabricius): Fabricius, 1794: 140.21; 1803: 211.31.

Anisoscelis australis (Fabricius): Dallas, 1852: 454.10; Walker, 1871: 130.30.

Anisoscelis australe (Fabricius): Mountrouzier 1861: 66.25.

Theognis australis (Fabricius): Mayr 1866: 104.

Leptoglossus australis (Fabricius): Stål, 1868: 51.2; Breddin, 1901: 173.47; Cheesman, 1927: 155.8; China, 1930: 96.12; Usinger, 1939; 313, 1946: 23.11; Gross, 1963: 379.12; Szent-Ivany & Catley, 1960: 70; Allen, 1969: 81.

General and differential diagnosis: Body dark brown to black occasionally chocolate brown (specimens from Australia); margin of scent gland scars tinged with yellowish white, occasionally slightly darker; tibial dilation extending over 43 to 72% of the length of tibia (fig. I_2, I_3).

Description: General characters see Mayer, 1866:104; Allen, 1969: 81; male and female genitalia similar to F. gonagra.

Measurements and Ratios: (see tables 35 and 36)

Geographical distribution: (Map 13) The only species of the tribe, not present in America. Its distribution range is extremely wide, extending over the tropical and subtropical zones of the Ethiopian, Oriental and Australian regions and, as its closely related American species, F. gonagra, is not restricted to the mainland, but colonized most of the islands of Africa, south-east Asia and Pacific islands.

Habitat and Biology: The frequency of the adults collected did not vary considerably throughout the whole year, and at dissections, the developed eggs were found in females captured in January, March and May; the eggs are subcylindrical, with one side flat, length = 1.71mm, width = 1.17mm, height = 0.95mm.

F. australis is one of the few species of Anisoscelini in which the life history, economic importance and control has been studied (Szent-Ivany and Catley, 1960; Fernando, 1957; and Pagden, 1928). The host plants recorded by Allen (1969) include cotton, beans, citrus, banana, guava, wild passiofruit and cucurbitaceous plants; it was also reported on tomato (Lever, 1933). According to Muller (1939), F. australis is a vector, transmitting Nematospora coryli on Citrus.

Discussion: As in F. gonagra the most important variations observed in the studied material were as follows: the brown stripes on dorsal

surface of the head anterior to ocelli, vary individually in number and shape, even in specimens from the same locality and in some may be altogether absent; when the stripes are reduced in width or in length or in both this area of the head carries some brown rounded or oval patches whose relative position vary considerably. Marked geographical variation is shown in differences of the general size of the body, shape of humeral angles, and the length and width of tibial dilations. Two distinct allopatric forms can be recognised: (1) one larger and comparatively robust, with humeral angles long and spinose (fig. K), and long and wide foliaceous tibial dilation, with deep emarginations and acute projections on external margin (fig. I_2); this form was described as Cimex membranaceus by Fabricius 1781 and is distributed over Ethiopian and Oriental regions. (2) The second comparatively small and short, with humeral angles obtuse (fig. L), and tibial dilation ovalate, short and narrow, sometimes with shallow emarginations and small spines (fig. I_3); this form was described as Cimex australis by the same author in 1775, and its distribution is restricted to the Pacific Islands of the Australian region. Since their publication these two forms were considered to represent distinct species, until Gross (1963) recognized their conspecifity; and this was confirmed by Allen (1969) and also in this study. The wide intermediate contact area of these two forms extends over Indonesia, New Guinea, New Hebrides and Eastern part of Australia; in this area the condition of the three differentiating characters vary clinally from one form to another and all the material from this area shows various degrees of intermediate conditions between the two forms. (For further comments about geographical

variation see Allen 1969: 82). These observations lead to the conclusion that the two distinct geographical forms of this species do exist, which for convenience may be best treated as subspecies, i.e. F. australis membranaceous (Fabr.) and F. australia australis (Fabr.) of Fabrictilis australis (Fabr.).

Fabrictilis australis australis (Fabricius) 1775

Differential diagnosis: Body comparatively smaller and shorter, humeral angles of pronotum obtuse (fig. L), tibial dilation lanceolate, short and narrow, sometimes with shallow emarginations and small spines (fig. I_3).

Measurements and Ratios: (see table 35).

Geographical distribution: The material was collected in: Solomon Is., Guadalcanal; New Hebrides, Malekula; Samos Is., Upolu Is.; Fiji Is., Nandi; Tonga Is.; Society Is., Tahiti, Borabora; Hawaiian Is., Hawaii.

Material examined.

a) Type material: Cimex australis Fabricius, 1 ♂, 1 ♀ and one specimen without the abdomen (♂ or ♀?) form the syntype series: the male and the female are in BMNH (Banks Collection), the male labelled "63.47" was designated and labelled as lectotype, and the other one labelled "Otaheite, 63.47" as paralectotype; the third specimen in UZM (Kiel Collection), labelled simply "australis" was designated as another paralectotype.

b) Other material: 95 specimens from the above localities in: MNHN. IRSNB, RNH, ZIU, ZMU, UZM, NR, NM, DEI, BMNH.

Fabrictilis australis membranaceus (Fabricius), 1781 stat.n

Cimex membranaceus Fabricius, 1781: 351.79. LECTOTYPE ♂, Cape Verde Is., Atlantic Ocean (Insula St Jago promontorri viridis) (UZM), here designated [examined].

Cimex membranaceus Fabricius: Fabricius, 1787: 289.98; Gemelin, 1790: 2142.233.

Lygeus membranaceus (Fabricius): Fabricius, 1794: 139.16; Wolff, 1800: 22; Fabricius, 1803: 209.23.

Anisoscelis membranacea (Fabricius): Latreille, 1829: 197; Burmeinster, 1839: 332.3; Westwood, 1842: 16; Dallas, 1852: 454.9; Walker, 1871: 129.28.

Coreus (Anisoscelis Latr.) membranaceus (Fabricius): Burmeister, 1834: 295.21.

Cimex mormodice Forster, 1844: 16.10. Holotype Cape Verde Is. (lost)

Anisoscelis orientalis Dallas, 1852: 454.8. LECTOTYPE ♀ Phillippine (BMNH), here designated [examined].

Anisoscelis bidentatus Montrouzier, 1855: 101. Holotype no locality specified (lost).

Anisoscelis flavopunctatus Signoret, 1862: 26. Holotype Reunion (lost).

Theognis membranaceus (Fabricius): Stål, 1865: 86.1; Mayr, 1866: 103.

Leptoglossus membranaceus (Fabricius): Stål, 1870: 648.1; 1873: 68.1;

Tryon, 1892: 22.57; Horrath, 1900: 636.28; Breddin, 1900: 157; 1901: 173.47; Distant, 1902: 382.632; 1903: 343.65; Kirkaldy, 1905: 352; Shouteden, 1907: 286.9; Shiraki, 1913: 122.10, pl. 7, fig. 11; Matsumura, 1913: 135.195, pl. 13, fig. 18; Distant, 1913b: 146.21; Esaki, 1926: 154.77; Tillyard, 1926: 147; Pagden, 1928: 387; Blöte, 1936: 29; Villiers, 1952: 102.

Leptoglossus bidentatus (Mountrouzier): Stål, 1873: 69.2; Distant, 1914: 377.22.

Anisomelis orientalis Kirby, 1891: 92 [incorrect subsequent spelling]

Leptoglossus membranaceus bidentatus (Montrouzier): Shouteden, 1907: 113.29; Bergroth, 1913: 142; Blöte, 1936: 29.

Leptoglossa membranaceus: Shiraki, 1910: 91.65, pl. 38. fig. 18 [incorrect subsequent spelling].

Leptoglossus membranaceus sumbawensis: Blöte, 1936: 29. syn.n.

Differential diagnosis: Body comparatively larger and robust, humeral angles of pronotum long and spinose (fig. K), tibial dilation foliaceous long and wide, with deep emarginations and acute projections, on external margin (fig. I_2).

Measurements and Ratios: (see table 36).

Geographical distribution: Ethiopian region: Morocco, Mauritania, C. Verde Is., Senegal, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Dahomey, Nigeria, Cameroun, Fernando Poo Is., Sao Tome Is., Gabon, Angola, South Africa, Mozambique, Rhodesia, Zambia, Malawi, Madagascar, Tanzania, Zanzibar, Congo, Uganda, Kenya and Sudan. Oriental region:

India, Ceylon, East Pakistan, Burma, Laos, Taiwan (Formosa), West Malaysia and Philippines.

Material examined.

a) Type material: Cimex membranaceus Fabricius, 2 ♂♂ syntypes: one of these labelled "membranaceus" is in UZM (Kiel Collection) and in the course of this study, was designated and labelled lectotype; the other specimen in BMNH (Bank's Collection) with no label was designated as paralectotype.

Anisoscelis orientalis Dallas was based on two syntypes but only one of them, a female specimen labelled "type, 29 Anisoscelis orientalis, 42-22, Phill. Isla" is preserved in BMNH and was designated and labelled lectotype.

b) Other material: Approximately 1500 specimens from above localities, in: MNHN, IRSNB, ZI, TM, RNH, ZMU, UZM, NR, NHM, NM, ZSBS, DEI, BMNH, MRAC.

Table 35 Measurements (5 ♂♂ and 5 ♀♀ from 10 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.0-20.7	18.2	5	17.3-20.0	18.9
2 Head length	5	2.75-3.04	2.92	5	2.96-3.23	3.09
3 " width	5	2.37-2.56	2.46	5	2.39-2.56	2.50
Distance:						
4 inter-ocular	5	1.31-1.33	1.32	5	1.29-1.42	1.36
5 ante-ocular	5	1.36-1.46	1.44	5	1.48-1.53	1.51
Antennae:						
6 segm. I length	5	2.58-3.57	3.12	5	2.51-3.23	2.89
7 " II "	4	3.69-4.65	4.19	5	3.84-4.32	4.15
8 " III "	4	2.88-3.60	3.24	5	3.12-3.60	3.33
9 " IV "	4	4.17-4.56	4.39	4	3.84-4.51	4.22
Labium:						
10 segm. I length	5	2.71-3.13	2.92	5	3.04-3.47	3.22
11 " II "	5	2.85-3.04	2.93	5	2.85-3.42	3.17
12 " III "	5	1.71-1.90	1.78	5	1.90-2.07	1.95
13 " IV "	5	3.42-3.80	3.57	5	3.42-3.99	3.84
14 Pronotum length	5	2.68-3.45	3.07	5	2.92-3.50	3.26
15 " width	5	5.08-6.72	5.85	5	5.37-6.86	6.15
16 Scutellum length	5	2.01-2.66	2.27	5	2.18-2.60	2.44
17 " width	5	2.09-2.81	2.44	5	2.28-2.98	2.59
18 Hind tibia length	5	8.54-11.2	9.98	5	8.80-10.2	9.60
Tibial dilation:						
19 total width	5	1.29-2.44	1.99	5	1.29-2.82	2.19
external part:						
20 length	5	4.27-7.20	5.82	5	3.84-6.86	5.68
21 width	5	0.62-1.63	1.22	5	0.68-1.82	1.34
internal part:						
22 length	5	2.88-4.56	3.85	5	2.54-4.46	3.59
23 width	5	0.28-0.52	0.44	5	0.32-0.72	0.56
24 Undilated portion	5	1.20-2.44	1.99	5	2.88-3.50	3.15
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.46-7.04:1	6.23:1	5	5.38-6.57:1	6.13:1
1 / 18	5	1.68-1.93:1	1.82:1	5	1.89-2.03:1	1.97:1
2 / 3	5	1.27-1.14:1	1.18:1	5	1.18-1.29:1	1.23:1
6 / 2	5	0.85-1.25:1	1.06:1	5	0.78-1.06:1	0.93:1
10 / 2	5	0.94-1.03:1	1.00:1	5	0.95-1.14:1	1.04:1
9 / 6	4	1.24-1.51:1	1.36:1	4	1.33-1.58:1	1.45:1
15 / 16	5	2.43-2.76:1	2.57:1	5	2.34-2.63:1	2.52:1
20 / 18 %	5	50.0-63.8	58.3	5	43.2-63.7	59.1
22 / 18 %	5	33.7-42.7	38.5	5	28.6-43.4	37.3

Table 36 Measurements (5 ♂♂ and 5 ♀♀ from 9 localities) in millimetres.

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	17.0-22.0	20.2	5	17.0-21.0	19.6
2 Head length	5	2.85-3.23	3.09	5	2.85-3.23	3.07
3 " width	5	2.29-2.62	2.53	5	2.35-2.64	2.50
Distance:						
4 inter-ocular	5	1.29-1.42	1.35	5	1.25-1.52	1.36
5 ante-ocular	5	1.42-1.63	1.54	5	1.38-1.61	1.49
Antennae:						
6 segm. I length	4	2.85-3.42	3.23	5	2.47-3.23	2.89
7 " II "	4	3.98-4.80	4.47	5	3.36-4.46	4.11
8 " III "	4	3.45-3.84	3.63	4	2.64-3.60	3.29
9 " IV "	2	4.65-5.08	4.86	3	4.32-4.89	4.57
Labium:						
10 segm. I length	5	2.47-3.38	3.09	5	2.56-3.53	3.04
11 " II "	4	2.56-3.36	2.95	5	2.47-3.42	2.91
12 " III "	4	1.52-1.99	1.73	5	1.46-2.12	1.76
13 " IV "	4	2.86-4.48	3.50	5	2.66-4.18	3.33
14 Pronotum length	5	3.16-3.84	3.54	5	2.83-3.98	3.32
15 " width	5	7.39-8.16	7.51	5	6.29-8.92	7.27
16 Scutellum length	5	2.22-2.67	2.56	5	2.24-3.02	2.62
17 " width	5	2.28-2.96	2.71	5	2.28-3.42	2.81
18 Hind tibia length	5	10.1-11.8	11.2	5	7.92-11.5	10.1
Tibial dilation:						
19 total width	5	2.44-3.26	2.81	5	2.16-3.79	2.96
external part:						
20 length	5	6.24-8.16	7.44	5	4.80-8.16	6.67
21 width	5	1.58-2.35	1.90	5	1.44-2.44	1.95
internal part:						
22 length	5	4.08-5.28	4.78	5	2.97-5.28	4.43
23 width	5	0.48-0.68	0.58	5	0.48-0.96	0.67
24 Undilated portion	5	1.96-3.12	2.61	5	2.16-2.64	2.54
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.96-7.02:1	6.53:1	5	5.59-7.07:1	6.38:1
1 / 18	5	1.68-1.91:1	1.80:1	5	1.82-2.14:1	1.94:1
2 / 3	5	1.19-1.26:1	1.22:1	5	1.15-1.28:1	1.22:1
6 / 2	4	1.00-1.09:1	1.04:1	5	0.85-1.06:1	0.94:1
10 / 2	5	0.86-1.06:1	1.00:1	5	0.89-1.06:1	0.99:1
9 / 6	2	1.41-1.48:1	1.45:1	3	1.44-1.74:1	1.58:1
15 / 16	5	2.81-3.04:1	2.93:1	5	2.54-3.07:1	2.77:1
20 / 18 %	5	61.9-72.6	66.4	5	60.5-68.3	66.0
22 / 18 %	5	40.4-44.5	42.6	5	37.5-48.6	43.8

MICROPHYLLIA Stål gen. rev.

(Plates 36 - 4)

Microphyllia Stål, 1870: 167.1. Type-species: Theognis fasciolatus Stål by monotypy.

Diagnosis: Small to medium sized species. Head. Basically black with two stripes behind ocelli and a patch on genae yellow ochre to reddish brown. Slightly declivent; depressed behind ocelli; tylus slightly or well projecting above, and anterior to juga; tylus and juga below the level of antenniferous tubercles; ratio length of head to inter-ocular distance = 2.07 - 2.57:1 (2.39:1); Ist antennal segment variable in length, it may be slightly shorter or slightly longer than the head, labium variable in length, from short reaching only the posterior margin of second, to long extending up to the anterior margin of the fourth sternite. Thorax. Pronotum, scutellum and corium usually dark brown to black, occasionally reddish brown, with four yellow ochre to orange rounded patches on pronotum, and two smaller on corium. Pleural region yellow orange to orange brown, or reddish brown with black markings, or reddish brown to black with yellow ochre to orange markings. Pronotum gradually declivent; calli with sculpture different from the disk, well separated from each other by a slightly elevated median part, the latter sometimes with a pair of small tubercles; lateral margins slightly to moderately

sinuate and entire; pronotal disk with low median longitudinal carina; humeral areas slightly projecting laterally, usually somewhat depressed below the level of dorsal part of the disk, slightly deflected or rising towards the humeral angles, posterior margin of pronotum slightly concave or straight and strongly depressed, the depression extending over the humeral areas. Scutellum usually longer than wide, sometimes wider than long or as long as wide, transversely rugulose and punctate, slightly convex, occasionally with a median transverse depression. Hind tibia (fig. I) with small somewhat rounded tibial dilation, occasionally rather wide and foliaceous, or very small almost obsolete; with or without emarginations. Corium finely or moderately densely punctated. Abdomen. Tergites dark brown to black, usually with round spots on scent gland scars, but occasionally without this spot; tergites III to VII very occasionally with median part reddish orange (this condition only observed as a variation in one species).

Male genitalia: Genital capsule usually projecting posteriorly (fig. A,B) - without subproctigeral sac; posterior margin usually short, with dorsal prongs, median notch always present. Parameres (fig. C,D) - shaft with slightly to moderately developed outer lobe and small distal cavity; shank variable in shape, without median lobe. Phallus (fig, E) - phallotheca slightly sclerotized laterally; conjunctiva bulging dorsally with very conspicuous dorsal fold; dorsal sac variable in shape and size, may be short and bulging or elongate tapering distally, with a pair of small distal lateral lobes or a single subapical and posterior lobe (b); processes 3a-b membranous, occasionally with sclerotized apex, variable

in shape and size and may be long and narrow, very long and wide projecting laterally or bent anteriorly, or stout and short with an intermediate process 3c; processes 9a-b present or absent and sclerotized or not; processes 11a-b membranous; process 5a short, thick or very thick, second convolution short and strongly coiled. Processes 4a-b absent.

Female genitalia: Spermatheca very short, but occasionally with the tubular portion of the duct long; duct dilation variable in shape and size, occasionally the latter reduced to a small bulging part; distal part of the duct usually thick and short, occasionally rather narrow and elongate; coiled part strongly to moderately coiled; spermathecal bulb capitate, occasionally with one extremity abnormally produced.

Geographical distribution: (Maps 14, 15) Only known from South America, but the records are scarce and apparently incomplete, from widely separated localities at altitudes from 0 to 3000m.

Discussion: Microphyllia was established by Stål as a monotypic genus to include M. fasciolata; the principal character differentiating it from Leptoglossus sens. lat. and Narnia was the very small size of the tibial dilation. The examination of other morphotogical characters and female genitalia, indicated that Microphyllia has the same rank as any of the other genera in the Leptoglossus group of genera and that M. fasciolata is related to several species such as harpagon, flavosignata and three other species here described, forming a group of related species now included in the genus Microphyllia as here conceived, amended and defined. Among the other genera of the Leptoglossus group of genera this

genus is quite distinct but related to the genera Fabrictilis and Veneza.

KEY TO SPECIES

1 Humeral areas expanded into large broadly rounded lateral processes; pronotum black with a wide orange patch across the disk.....alata (p.339)

- With different combination of characters than above.....2

2 (1) Tibial dilation very small, almost obsolete; two elongate patches extending from calli to posterior margin of pronotum yellow ochre to reddish orange.....fasciolata (p.343)

- With different combinations of characters than above.....3

3(2) Tibial dilation with strong or shallow emarginations; a white small to large patch at least on internal tibial dilation; rounded yellow orange spots on abdominal scent gland scars.....4

- Tibial dilation without emarginations and unicolour; without spots on scent gland scars.....6

4 (3) Anterior pair of pronotal spots wide, fused medially and almost reaching the lateral margins; pleural region basically yellow orange, orange or orange brown, with black patches; duct dilation of spermatheca fusiform .....harpagon (p.365)

- Anterior pair of pronotal spots distinct and well separated from lateral margins; pleural region with different colour pattern; duct dilation of spermatheca not fusiform 5

5 (4) Anterior pair of pronotal spots rounded and large occupying most of the declivous area of pronotum, very close to one another; fore and middle tibia with white annulus; spermatheca globuliform with distal part of the duct narrow .....
.....flavosignata (p.373)

- Anterior pair of pronotal spots rounded and small, separated by a distance greater than the width of each spot; fore and middle tibia without white annulus; spermatheca with duct dilation almost as wide as the duct itself, distal part of the duct wide .....brasiliensis (p.359)

Anterior pair of pronotal spots reduced to small points; pleural region basically black with yellow ochre to yellow orange patches; dorsal prongs of genital capsule projecting obliquely; paramere with small outer lobe; phallus as in plate 38, fig. E .....pittieri (p.354)

- Anterior pair of pronotal spots wider, pleural region basically yellow orange to reddish orange with black patches; dorsal prongs of genital capsule projected dorsally; outer lobe absent; phallus as in plate 39, fig. E .....alleni (p.348)

Michrophyllia alata (Walker) 1871 comb.n

(Plate 36)

Anisoscelis alata Walker, 1871: 129. Holotype ♀ Brasil (BMNH) [examined, dissected].

Leptoglossus alata (Walker): Lethierry & Severin, 1894: 46; Allen, 1969: 71.

General and differential diagnosis: Pronotum with wide orange patch across the disk; humeral areas expanded into large broadly rounded lateral processes; lateral and postero lateral margins conspicuously dentate. Characteristic features of ♀♀: shape and size of spermatheca.

Description: General characters see Allen, 1969: 71.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with subovoidal moderate duct dilation, tubular part of the duct long and narrow.

Measurements (1♀) in millimetres: Body length = 23.0; Heal length = 3.42; Head width = 1.67; Distances: inter-ocular = 1.38, ante-ocular = 1.44; Antennal segments: I = 3.32, II = 2.85, III = 3.40, IV = ; Labial segments: I = 3.40, II = 3.04, III = 1.86, IV = 4.27; Pronotum:

length = 3.74, width = 4.46; Scutellum: length = 2.77, width = 2.85; Hind tibia length = 9.40; Tibial dilation width = 1.82; External tibial dilation: length = 4.80, width = 0.80; Internal tibial dilation: length = 3.84, width = 0.62; undilated part = 3.84.

Ratios: Body length/head length = 6.72; Body length/tibia length = 2.44; Head length/head width = 2.04; Ist Antennal segment/head length = 0.97; Ist Labial segment/head length = 0.99; IVth Antennal segment/Ist Antennal segment = ; Pronotum width/scutellum length = 1.61; External tibial dilation length/tibia length = 51.0; Internal tibial dilation length/tibia length = 40.8.

Geographical distribution: (Map 14) Only known from type locality Brasil.

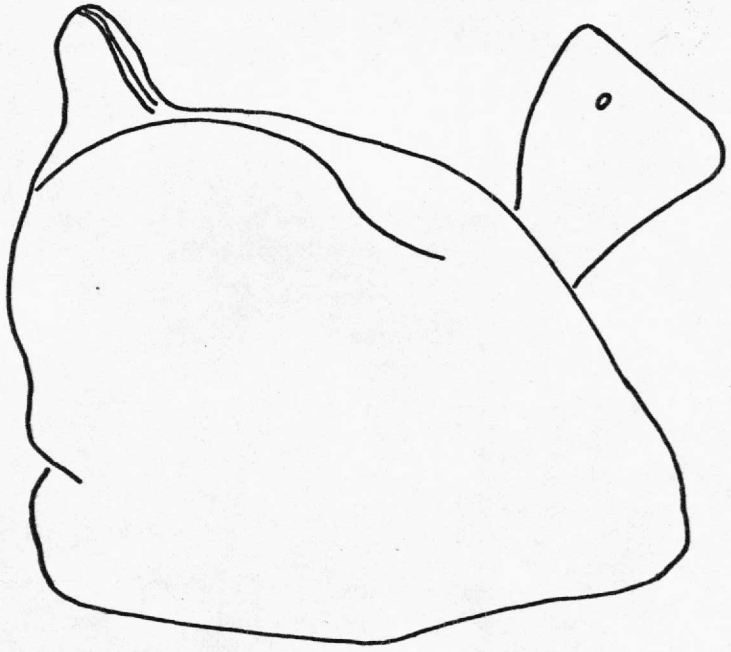
Discussion: Allen (1969) placed M. alata in the harpagon group of species and close to Theognis lineosus and T. subauratus, on the basis of the declivous condition of the head, shape of the tibial dilation, surface texture and the amount of pubescence on the body. In my opinion the actual conditions of these characters, and - in addition - the orange and metallic colouration on pronotum, the spot on corium, colour pattern of thoracic pleurae and of the abdominal tergites and sternites, suggest that this species is more closely related to species included in the genus Microphyllia than to those of the genus Theognis as here understood; its locality of occurrence is also within the distribution range of the genus Microphyllia. The shape of spermatheca of M. alata is quite different from that prevailing in Theognis; it differs also to some extent from

that of any species placed in Microphyllia but conforms better with the general conditions found in these species than with any of Theognis spp. M. alata is however known only from a single female specimen (the holotype) and at present I am tentatively placing it in Microphyllia.

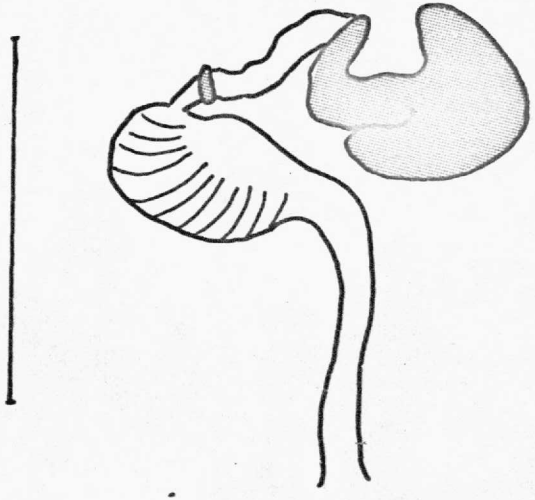
Material examined.

a) Type material: Holotype ♀ of Anisoscelis alata Walker, from Brasil, Pará, labelled "Type, 27 Anisoscelis alata, Para, 51/42" in BMNH collection.

Plate 36



G



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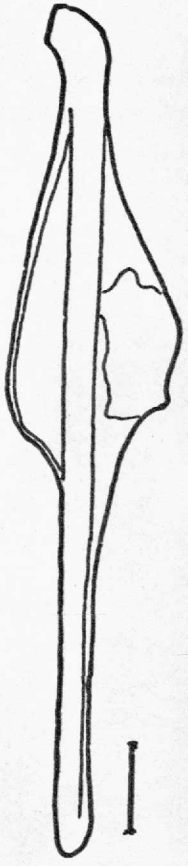


I

Microphyllia fasciolata (Stål) 1862

(Plate 37)

Theognis fasciolatus Stål 1862: 295. not. Holotype ♀, Colombia (NR) [examined, dissected]

Microphyllia fasciolata (Stål): Stål, 1870: 167.1

General and differential diagnosis: Two elongate patches extending from calli to posterior margin of pronotum, colour pattern of pleural region, and shape and size of tibial dilation. Characteristic features of ♂♂: shape of Ist gonocoxa and shape and size of spermatheca.

Description: (based only on females) Head. Basically black, with two short dorsal stripes behind the ocelli, and two lateral patches, one below the antenniferous tubercle and the other below and behind the eye, yellow ochre to orange brown. All labial and antennal segments black, IVth antennal segment dull. Tylus blunt and slightly projecting, forming a curved and slightly elevated ridge anterior to and between the juga; the latter somewhat bulging tapering anteriorly, with straight median margin. Labium reaching the IVth sternites. Thorax. Pronotum, scutellum and corium basically black, with the following yellow ochre to reddish orange markings: On pronotum - elevated area between calli and two irregular elongate patches extending from posterior margin of calli to posterior margin of pronotum. On corium - a rectangular to suboval transverse patch on cross vein m-cu. Pleural region reddish orange to orange brown with collar, precoxal bridges and margins of supracoxal lobes black. Sternal area black with a median longitudinal band on mesosternum

dark yellow ochre. All legs black, antero-distal surface of femora with a suboval dark orange brown patch. Pronotal calli elevated; pronotum declivent, scarcely punctated; humeral areas raised and depressed towards the horizontal subacute humeral angles; posterior margin of pronotum concave. Hind tibia (fig. I) with small external and internal dilation the internal one sometimes absent. Abdomen. Tergites basically black, with anterior part of each connexival segment reddish orange. Sternites basically dark yellow ochre to reddish orange, with the following black markings: median part of IInd sternite; postero-lateral corner of each segment; suboval patch below and slightly behind each spiracle, on sternites V to VIII, these patches cover the area of trichobothria; median part of sternite VII; ventral part of Ist gonocoxa, and proctiger.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with short and thick duct.

Measurements and Ratios: (see table 37).

Geographical distribution: (Map 14) Only known from Colombia.

Habitat and Biology: During the dissection the two available females whose dates of collection were not recorded, were found with developed eggs; the eggs are subcylindrical with one side flat, length = 1.82mm, width = 1.33mm, height = 1.04mm.

Discussion: The other female specimen examined, showed the following

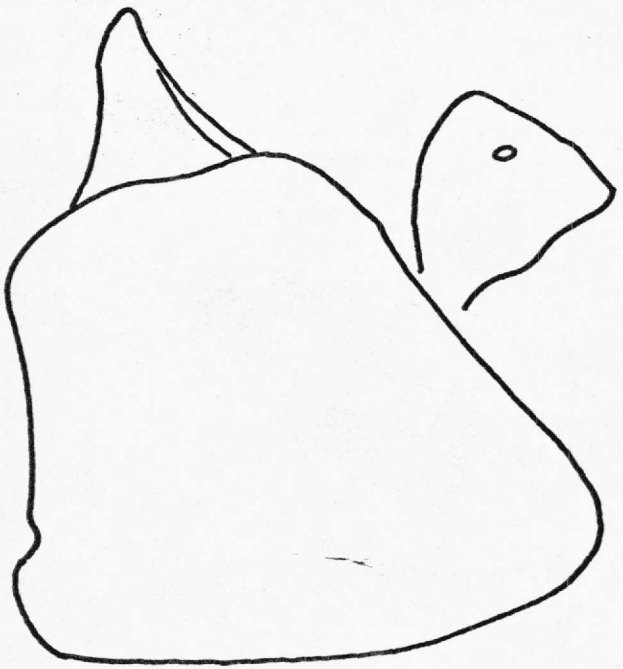
differences with the holotype: lateral patches on head restricted to a very small spot on dorsal anterior part of buccula and a tiny spot below the eye; patch on central part of calli, absent; patches on pronotum restricted to two divergent subrectangular patches behind the posterior margin of calli and two subtrapezoidal patches on posterior margin of pronotum; pleural region with black markings as follows: On propleural region - dorsal margin of postepimeral flange I, pleural calli, pleura and most of supracoxal lobes. On mesopleura - ventral half of supracoxal lobes. On metapleura - dorsal and anterior margin of pleura, and ventral half of supracoxal lobe. Median part of tergites III to VII reddish orange.

Material examined.

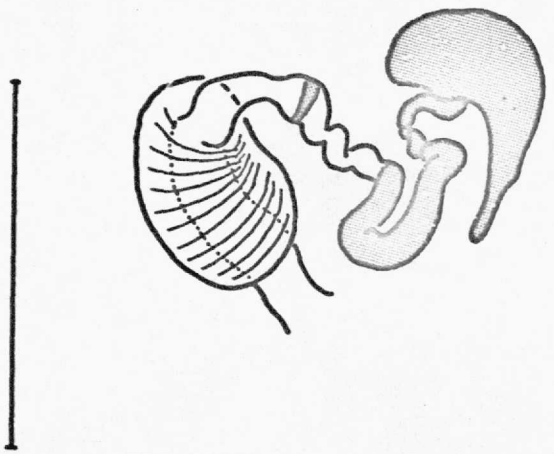
a) Type material: Holotype ♀ of Microphyllia fasciolata Stal, labelled "Typus, Colombia, Nisser", in NR.

b) Other material: COLOMBIA: Bogota, Lindig, 1 ♀ (NR).

Plate 37



G



H

I

Table 37 Measurements (2 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	–	—	—	2	18.0–18.5	18.2
2 Head length	–	—	—	2	2.56–2.58	2.57
3 " width	–	—	—	2	2.28–2.45	2.36
Distance:						
4 inter-ocular	–	—	—	2	1.15–1.23	1.19
5 ante-ocular	–	—	—	2	1.25–1.27	1.26
Antennae:						
6 segm. I length	–	—	—	2	2.47–2.66	2.56
7 " II "	–	—	—	2	3.55–3.98	3.76
8 " III "	–	—	—	2	2.54–2.88	2.71
9 " IV "	–	—	—	2	3.98–4.12	4.05
Labium:						
10 segm. I length	–	—	—	2	2.37–2.47	2.42
11 " II "	–	—	—	2	2.14–2.37	2.25
12 " III "	–	—	—	2	1.34–1.42	1.38
13 " IV "	–	—	—	2	2.43–2.58	2.50
14 Pronotum length	–	—	—	2	3.02–3.36	3.19
15 " width	–	—	—	2	5.66–5.95	5.80
16 Scutellum length	–	—	—	2	2.01–2.29	2.15
17 " width	–	—	—	2	2.26–2.31	2.28
18 Hind tibia length	–	—	—	2	7.24–7.44	7.34
Tibial dilation:						
19 total width	–	—	—	2	0.62–0.76	0.69
external part:						
20 length	–	—	—	2	1.34–1.68	1.51
21 width	–	—	—	2	0.28–0.33	0.30
internal part:						
22 length	–	—	—	1	1.10	1.10
23 width	–	—	—	1	0.19	0.19
24 Undilated portion	–	—	—	2	4.27–4.36	4.31
Ratios: (figures refer to character numbers above).						
1 / 2	–	—	—	2	7.03–7.17:1	7.08:1
1 / 18	–	—	—	2	2.48:1	2.48:1
2 / 3	–	—	—	2	1.05–1.12:1	1.04:1
6 / 2	–	—	—	2	0.96–1.03:1	0.99:1
10 / 2	–	—	—	2	0.92–0.95:1	0.94:1
9 / 6	–	—	—	2	1.49–1.66:1	1.58:1
15 / 16	–	—	—	2	2.59–2.81:1	2.69:1
20 / 18 %	–	—	—	2	18.0–23.2	20.5
22 / 18 %	–	—	—	1	14.7	14.7

Microphyllia alleni, sp.n

(Plate 38)

General and differential diagnosis: Colour pattern on pleural region and shape of tibial dilation. Characteristics features of ♂♂: the shape of genital capsule and parameters; the swollen dorsal sac, the shape size and position of processes 3a-b, shape of processes 8a-b, shape and size of process 5a, absence of processes 9a-b. Those of ♀♀: the shape of Ist gonocoxa and shape and size of spermatheca.

M.alleni shows close relationship with M. brasiliensis and particularly with M. pittieri;the relationship between these three species is indicated by the genital capsule projecting posteriorly, with very conspicuous dorsal prongs; with the latter it also shares the absence of spots on scent gland scars. (see differential diagnosis of these two species).

Description: Head. Basically black, with two dorsal short stripes behind ocelli, an elongate lateral patch extending from base of antenniferous tubercles to the neck, and anterior part of buccula, yellow ochre to reddish orange. All labial and antennal segments black, IVth antennal segment dark yellow ochre to brown. Tylus blunt and slightly projecting forming a curved and elevated ridge between the juga; the latter tapering anteriorly with straight median margin. Labium not reaching beyond the middle of IIIrd sternite. Thorax. Pronotum, scutellum and corium basically black, with the following yellow ochre markings: On pronotum - two suboval spots anterior to the median transverse line of pronotum, and two smaller rounded

spots on posterior margin. On corium - a small subcupular transverse patch on cross vein m-cu. Veins of corium partially or totally dark red. Pleural region basically yellow orange to reddish orange, with the following black markings: On pleural region - collar, a patch on pleura sometimes extending posteriorly on postepimeral flange I, margins of supracoxal lobes, occasionally extending to the whole lobe. On mesopleura - precoxal bridge and margins of supracoxal lobes; occasionally a wide patch on anterior margin and central area and part of postepimeral flange II. On metapleura - margin of supracoxal lobe, and upper anterior corner of pleura; occasionally a small patch on postepimeral flange III and the whole supracoxal lobe. Sternal area and legs black, femur occasionally with dark reddish brown colouration on external and anterior surfaces. Pronotal calli elevated, pronotum declivent, with dense fine punctation; humeral areas horizontal, level with disk of pronotum; humeral angles rising, subacutely expanded; posterior margin of pronotum slightly concave. Hind tibia (fig.I) with oval tibial dilation, external margin of the latter without emarginations. Abdomen. Tergites basically black, with anterior part of each connexival segment, yellow orange. Sternites basically yellow orange to reddish orange with the following black markings: posterior half of margins of each sternite; suboval patches below and slightly behind each spiracle, on sternites V to VIII, these patches cover the area of trichobothria; median area of sternites II and III, and partially the median area of sternites IV to VII. Genital segments black with yellow orange to reddish orange patches.

Male genitalia: Genital capsule projecting posteriorly (fig. A,B) - posterior margin short, above the level of lateral margins, with deep wide notch, dorsal prongs (a) very conspicuous projecting dorsally; lateral margins deeply concave. Paramere (fig. C,D) - shaft without outher lobe (b), shank terminating in thick, widely curved hook. Phallus (fig. E) - conjunctiva with short and swollen dorsal sac, the latter posteriorly with a bulging area (c) near the apex; conjunctiva armed with the following processes: 3a-b membranous, very large, directed antero laterally and terminating in a weakly sclerotized tip; 8a-b heavily sclerotized, subhorizontal with emarginated external margin, each with two flat anterior projections, 7a-b weakly sclerotized ; 11a-b membranous, 11a acute and 11b blunt; 5a(fig. E,F) short and very thick. 9a-b absent.

Female genitalia: First gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca fig. H with short and thick duct dilation.

Measurements and Ratios: (see table 38)

Geographical distribution: (Map 15) The material examined was collected from different localities in Bolivia, and one in Peru.

Habitat and Biology: During the dissections the two females examined whose date of collection was not recorded, contained developed eggs; the eggs are subcylindrical with one side flat, length = 1.61mm, width = 1.23mm, height = 0.87mm.

Discussion: The most important variations observed in the material examined were as follows: The male holotype had a tiny dark reddish brown patch on median distal half of scutellum and this was also found in two other examined specimens; four specimens, three males and one female from the same locality in Bolivia showed dark red colouration scattered on corium, and here and there on central area of scutellum and pronotum, extending the latter over the median elevated part of calli; or in one specimen almost over the whole calli. Two specimens, one male from Peru and a female from Bolivia showed an overall reddish brown colouration, the head with tylus and a median longitudinal line light brown, the black colouration on pronotum was restricted to humeral angles and posterior margin, and on corium to costal margin and posterior margin of clavus and the latteral surfaces of head and thorax were without distinct black patches, except for a propleural patch.

Material examined.

a) Type material: Holotype ♂ of Microphyllia alleni, Bolivia, San Antonio, O.Garlepp, in NR collection. Paratypes: BOLIVIA: same data as holotype, 1 ♂ (NR); Songo, 1 ♂, 1 ♀ (NR); Yungas de Coroico, Fassel, 1 ♂, 1 ♀ (Allotype) (NW), s.d., 1 ♂ (IZA); Coroico, 2 ♂ (RNH). PERU: Huancabamba, 1 ♂ (RNH).

Plate 38

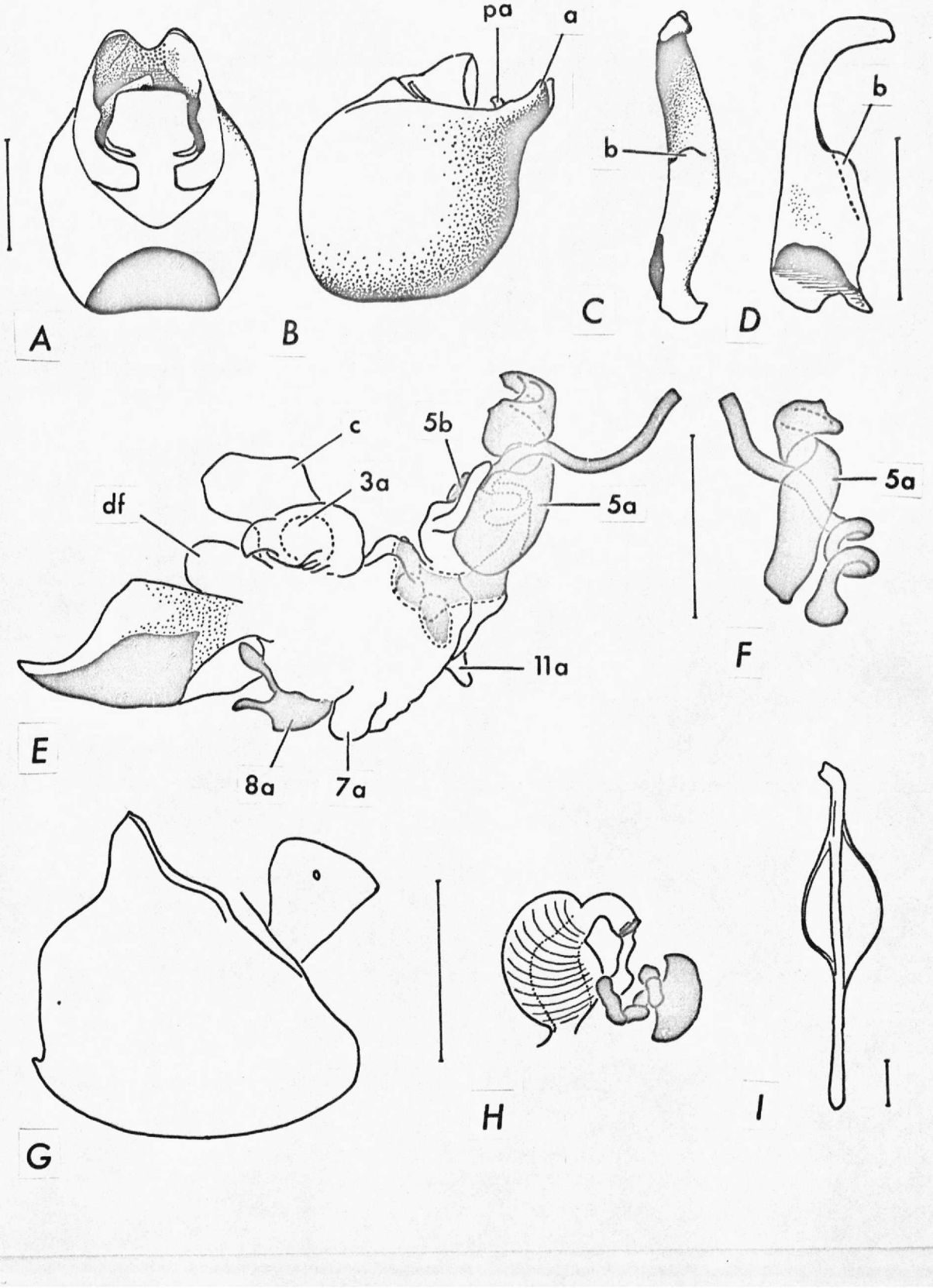


Table 38 Measurements (5 ♂♂ and 2 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.5-17.2	16.1	2	17.8-18.1	18.2
2 Head length	5	2.26-2.56	2.40	2	2.35-2.54	2.44
3 " width	5	2.05-2.24	2.16	2	2.24-2.33	2.28
Distance:						
4 inter-ocular	5	0.96-1.15	1.10	2	1.12-1.25	1.18
5 ante-ocular	5	1.14-1.29	1.20	2	1.19-1.23	1.21
Antennae:						
6 segm. I length	4	2.66-2.85	2.74	2	2.28-2.66	2.47
7 " II "	4	3.74-3.93	3.83	2	3.50-3.84	3.67
8 " III "	4	2.64-2.88	2.74	2	2.54-2.64	2.59
9 " IV "	4	4.56-4.03	4.35	2	4.17-4.36	4.26
Labium:						
10 segm. I length	4	2.09-2.28	2.19	2	2.28-2.47	2.37
11 " II "	4	2.09-2.18	2.12	2	2.18-2.28	2.23
12 " III "	4	1.17-1.33	1.23	2	1.23-1.38	1.30
13 " IV "	4	2.28-2.39	2.30	2	2.18-2.39	2.28
14 Pronotum length	5	2.64-3.12	2.90	2	3.21-3.55	3.38
15 " width	5	4.12-5.42	4.85	2	5.66-5.90	5.78
16 Scutellum length	4	1.90-2.09	1.98	2	2.09-2.18	2.13
17 " width	5	1.72-2.09	1.94	2	1.99-2.33	2.16
18 Hind tibia length	5	7.72-8.06	7.84	2	7.44-7.96	7.70
Tibial dilation:						
19 total width	5	1.48-1.82	1.66	2	1.68-1.72	1.70
external part:						
20 length	5	3.07-3.55	3.31	2	2.88-3.21	3.04
21 width	5	0.72-0.84	0.80	2	0.80	0.80
internal part:						
22 length	5	2.64-3.16	2.89	2	2.40-2.78	2.59
23 width	5	0.48-0.62	0.53	2	0.52	0.52
24 Undilated portion	5	2.97-3.12	3.02	2	2.97-3.26	3.11
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.41-6.87:1	6.70:1	2	7.00-7.91:1	7.45:1
1 / 18	5	1.87-2.14:1	2.05:1	2	2.33-2.39:1	2.36:1
2 / 3	5	1.05-1.15:1	1.11:1	2	1.00-1.13:1	1.07:1
6 / 2	4	1.07-1.17:1	1.14:1	2	0.89-1.13:1	1.01:1
10 / 2	4	0.84-0.94:1	0.91:1	2	0.89-1.05:1	0.97:1
9 / 6	4	1.49-1.69:1	1.58:1	2	1.63-1.82:1	1.72:1
15 / 16	4	2.50-2.59:1	2.53:1	2	2.70:1	2.70:1
20 / 18 %	5	38.7-44.8	42.2	2	38.7-40.3	39.4
22 / 18 %	5	34.3-40.4	36.8	2	32.2-34.9	33.6

Microphyllia pittieri sp.n

(Plate 39)

General and differential diagnosis: Colour pattern of pleural region, and shape of tibial dilation. Characteristics features of oo: the shape of genital capsule and parameres; the shape, size and position of processes 3a-b, shape and condition of processes 9a-b and 7a-b, shape of processes 8a-b, and shape and size of process 5a. Those of ♀♀: the shape of Ist gonocoxa and shape and size of spermatheca.

M. pittieri resemble **M. alleni** and **M. brasiliensis**. From both it can be distinguished by: the colour pattern of pleural region, absence of bulging area near apex of dorsal sac, and the condition of processes 9a-b of conjunctiva.

Description: Head. Basically black, with two dorsal short stripes behind ocelli and an elongate lateral patch extending from buccula to the neck, yellow ochre. All labial and antennal segments I to III black, IV antennal segment yellow ochre. Tylus blunt and slightly projecting, forming a curved and elevated ridge between the anterior part of juga; the latter tapering anteriorly, with straight median margin. Labium hardly reaching beyond the IIIrd sternite. Thorax. Pronotum, scutellum, corium and pleural region basically black, with the following yellow ochre to yellow orange markings: On pronotum - four identical rounded spots, forming the corners of an imaginary square, the posterior pair on the posterior margin of pronotum and the anterior slightly anterior to the middle of pronotum. On corium - a small sub-cupular transverse patch on cross vein **m -cu**. Veins of corium partially

dull dark red. On propleural region - patch above pleural calli, oval patch on median part of postepimeral flange I, one patch each at both extremities of the margin of the latter, and a patch on basal half of episternal supracoxal lobe. On mesopleura - patch extending over central area and episternal supracoxal lobe, and a patch on postemimeral flange II. On metapleura - a patch on evaporative area, and one on supracoxal lobe. Sternal area and legs black, distal half of hind tibia, dark yellow ochre. Pronotal calli elevated; pronotum declivent, densely and deeply punctated; humeral areas below the level of disk, horizontal and deflected towards humeral angles; the latter rising and obtuse; posterior margin of pronotum slightly concave. Hind tibia (fig. I) with wide and short tibial dilation, external margin of the latter without deep emarginations. Abdomen. Tergites and sternites basically black, with anterior part of each connexival segment, anterior corner of each sternite and a small spot on anterior margin of sternites IV and V yellow orange; genital segment dark yellow ochre to yellow orange with black margins.

Male genitalia: Genital capsule projecting posteriorly (fig. A,B) - posterior margin short, above the level of lateral margins, with deep "V" shaped median notch; prongs (a) projecting postero-dorsally; lateral margins concave. Paramere (fig. C,D) - shaft with small outer lobe, shank thick terminating in a thick curved hook. Phallus (fig. E) - conjunctiva with short and narrow dorsal sac, the apex of the latter with two small lateral lobes (b); conjunctiva armed with the following processes: 3a-b membranous, large, directed laterally and terminating in a weakly

slerotized tip; 9a-b reduced to a small flat lobe; 8a-b heavily sclerotized, subhorizontal with emarginated external margin, each with two flat anterior projections; 7a-b weakly sclerotized; 11a-b membranous and acute; 5a (fig. E,F) short and thick.

Female genitalia: First gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca, fig. H, with short and thick duct dilation.

Measurements and Ratios: (see table 39)

Geographical distribution: (Map 14) Only known from type locality.

Habitat and Biology: During the dissection all the females collected on 7 - VI - 1958 were found with developed eggs; the eggs are subcylindrical with one side flat, length = 1.65mm, width = 1.14mm, height = 0.76mm.

Discussion: The most important variations observed in the material examined were: two females had the lateral yellow ochre patch on head extended up to the antenniferous tubercles, and bucculae with only a small spot, one female had the IIIrd antennal segment with yellow ochre colouration on external margin, and two females had the median part of calli slightly tinged with brown.

Material examined.

a) Type material: Holotype ♂ of Microphyllia pittieri, Venezuela, Aragua, Rancho Grande, 1,100m, 2 - VI - 1958, C.J. Rosales in IZA collection. Paratypes: 2 ♀♀(Allotype), same data as holotype, in IZA collection; 1 ♀ s.d. (NW).

Plate 39

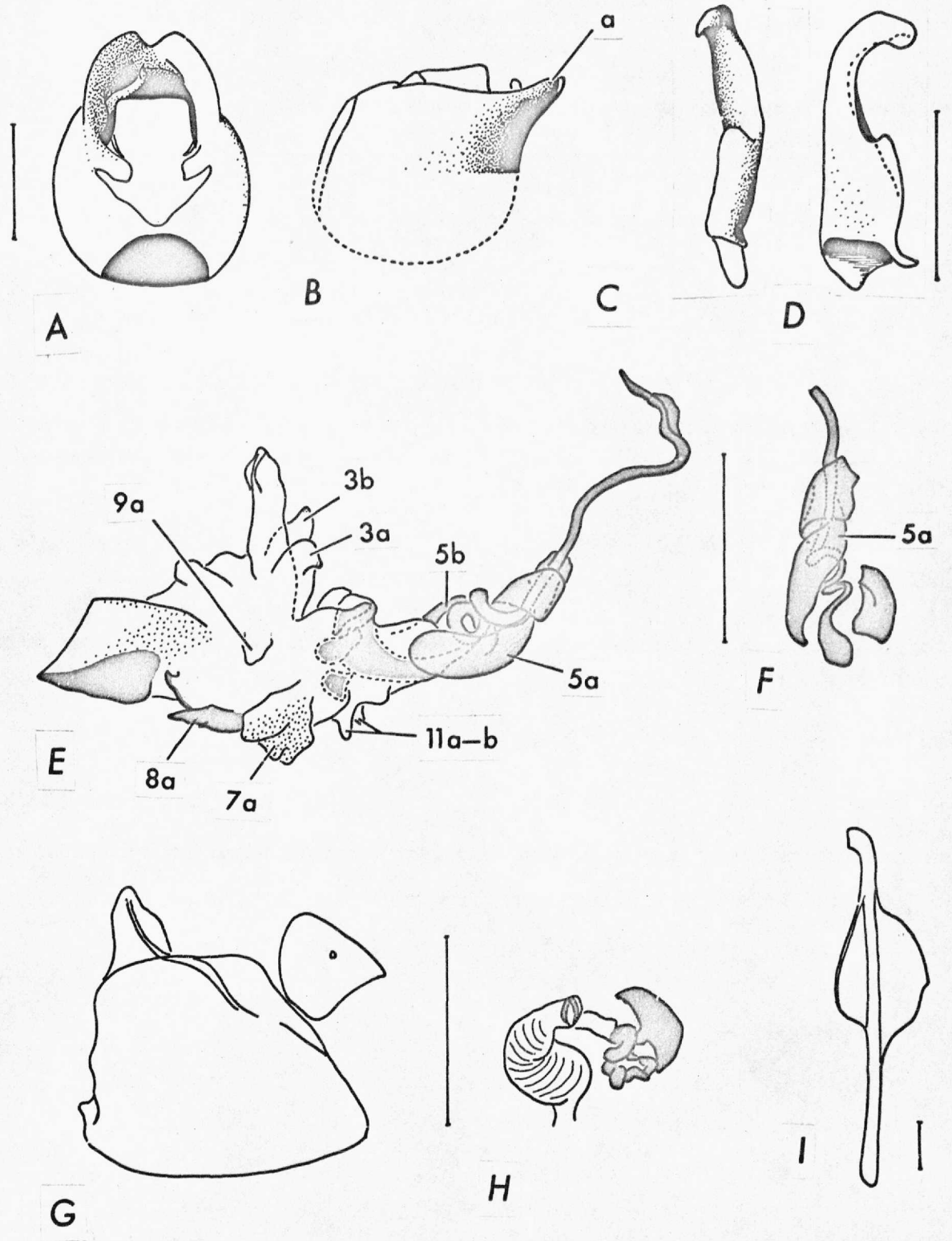


Table 39 Measurements (1 ♂ and 3 ♀♀ from 1 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	16.0	16.0	3	18.2-18.4	18.3
2 Head length	1	2.47	2.47	3	2.26-2.47	2.35
3 " width	1	2.10	2.10	3	2.26-2.28	2.26
Distance:						
4 inter-ocular	1	1.04	1.04	3	1.14-1.17	1.15
5 ante-ocular	1	1.04	1.04	3	1.10-1.19	1.15
Antennae:						
6 segm. I length	1	2.62	2.62	3	2.51-2.56	2.53
7 " II "	1	3.64	3.64	3	3.60-3.79	3.69
8 " III "	1	2.64	2.64	3	2.54-2.73	2.63
9 " IV "	1	3.98	3.98	3	4.27-4.56	4.38
Labium:						
10 segm. I length	1	2.35	2.35	3	2.37-2.52	2.46
11 " II "	1	2.24	2.24	3	2.37-2.47	2.43
12 " III "	1	1.23	1.23	2	1.33-1.42	1.37
13 " IV "	1	2.29	2.29	2	2.51-2.77	2.64
14 Pronotum length	1	3.16	3.16	3	3.12-3.36	3.24
15 " width	1	4.56	4.56	3	5.52-5.85	5.66
16 Scutellum length	1	1.90	1.90	3	2.09-2.22	2.15
17 " width	1	1.90	1.90	3	2.24-2.47	2.32
18 Hind tibia length	1	7.58	7.58	3	7.87-8.44	8.15
Tibial dilation:						
19 total width	1	1.87	1.87	3	2.16-2.54	2.28
external part:						
20 length	1	3.07	3.07	3	3.36-4.08	3.76
21 width	1	1.00	1.00	3	1.05-1.39	1.21
internal part:						
22 length	1	2.88	2.88	3	2.88-3.36	3.20
23 width	1	0.56	0.56	3	0.62-0.76	0.70
24 Undilated portion	1	2.97	2.97	3	2.88-3.16	3.05
Ratios: (figures refer to character numbers above).						
1 / 2	1	6.47:1	6.47:1	3	7.44-8.14:1	7.78:1
1 / 18	1	2.11:1	2.11:1	3	2.18-2.33:1	2.24:1
2 / 3	1	1.17:1	1.17:1	3	1.00-1.08:1	1.03:1
6 / 2	1	1.06:1	1.06:1	3	1.03-1.11:1	1.07:1
10 / 2	1	0.95:1	0.95:1	3	1.01-1.08:1	1.04:1
9 / 6	1	1.51:1	1.51:1	3	1.66-1.80:1	1.73:1
15 / 16	1	2.40:1	2.40:1	3	2.57-2.68:1	2.63:1
20 / 18 %	1	40.5	40.5	3	42.6-50.0	46.1
22 / 18 %	1	37.9	37.9	3	36.5-41.1	39.2

Microphyllia brasiliensis sp.n.

(Plate 40)

General and differential diagnosis: Shape of tibial dilation. Characteristic features of ♂♂: the shape of genital capsule and parameres; the shape, size and position of processes 3a-b-c, shape and condition of processes 9a-b and 7a-b, shape of processes 8a-b and shape and size of process 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

M. brasiliensis shows close relationships with M. pittieri and M. alleni, from both it can be distinguished by: the presence of yellow orange spots on scent gland scars, the sinuous median notch of the genital capsule, the shape of parameres, presence of process 3c and the condition of processes 9a-b of conjunctiva.

Description: Head. Basically black, with two dorsal short stripes behind ocelli and an elongate lateral patch extending from buccula to the neck, yellow ochre to pale brown. Dorsal surface of the head sometimes with three reddish brown bands, i.e. one median from tylus to the level of ocelli, and two lateral from antenniferous tubercles to the neck. All labial and antennal segments reddish brown to black. Tylus generally projecting well above and anterior to juga, forming a very conspicuous keel between the anterior part of jugae, occasionally reduced to a ridge

between jugae; the latter with curved external margin and straight median margin. Labium not reaching beyond anterior half of IVth sternite. Thorax. Pronotum, scutellum and corium basically reddish brown to black with the following yellow ochre to orange markings: On pronotum - four somewhat rounded spots, two on central area and two near the posterior margin of pronotum. On corium - rounded or ovoid spot on cross vein m-cu. Posterior margin of pronotum and humeral areas black. Pleural region reddish brown to brown with the following yellow ochre to orange markings: On propleural region - supracoxal lobes, a patch on central and on ventral part of postepineral flange I, the latter two occasionally fused. On mesopleura - episternal supracoxal lobe and a patch on dorsal part of postepineral flange II. On metapleura - supracoxal lobe. Margin of supracoxal lobes II and III and sternal region black. All legs reddish brown to black. Tibial dilation with small white patch on basal half of internal dilation. Pronotal calli elevated; pronotum declivent with dense fine punctation; humeral areas horizontal, slightly below the level of the disk; humeral angles obtuse to subacute and horizontal; posterior margin of pronotum slightly concave. Hind tibia (fig. I) with external dilation slightly emarginated. Abdomen. Tergites basically black, with two rounded spots on each scent gland scar, and the anterior part of each connexival segment yellow orange. Sternites, first gonocoxa and laterotergites in females and genital capsule in males yellow ochre to reddish brown with the following black markings: rounded to ovoid patches below and slightly behind each spiracle, on sternites V to VIII, these patches cover the area of trichobothria; thricobothria of segments III and IV.

Male genitalia: Genital capsule projecting posteriorly (fig A,B) - posterior margin short, above the level of lateral margins, with wide slightly sinuous median notch, dorsal prongs (a) conspicuous, projecting obliquely, lateral margins deeply concave. Paramere (fig. C,D) - shaft with small rounded outer lobe, shank very thick, with internal margin sinuous, terminating in a wide gently curved hook. Phallus (fig, E) - conjunctiva with short and wide dorsal sac which posteriorly has a bulging area (b) near the apex; conjunctiva armed with the following processes: 3a-b-c membranous and short; 9a-b very conspicuous, moderately sclerotized; 8a-b heavily sclerotized, flat with blunt anterior projections, with lateral spine and emarginate lateral margins; 7a-b slightly sclerotized laterally; 11a-b membranous; 5a (fig. E,F) short and thick.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca, fig. H, very short and narrow, duct dilation reduced as illustrated but occasionally larger.

Measurements and Ratios: (see table 40)

Geographical distribution: (Map 14) Only known from several localities in Brasil.

Material examined.

a) Type material: Holotype ♂ of Microphyllia brasiliensis, labelled "Brasil, Parana, E.D. Jones 1905-163" in BMNH collection. Paratypes: BRASIL: Santa Catarina, Corupa, (Hansa Humbolt), - XI - 1948, 1 ♂ (AM); Pernanbuco, 1 ♀ (NM); s.d., 2 ♂ (MNHU); 1 ♂ (IZA); Botafogo, C. Van Voixem,

1 ♀ (IRSNB); Blumenau, 1 ♂ (RNH); Minas Geraes, 1 ♀ (NR). Without data, labelled "Distant coll. 1911-383, 1 ♀ (BMNH). La Palma, 1600m, P. Biolley, 1 ♀ (BMNH).

Plate 40

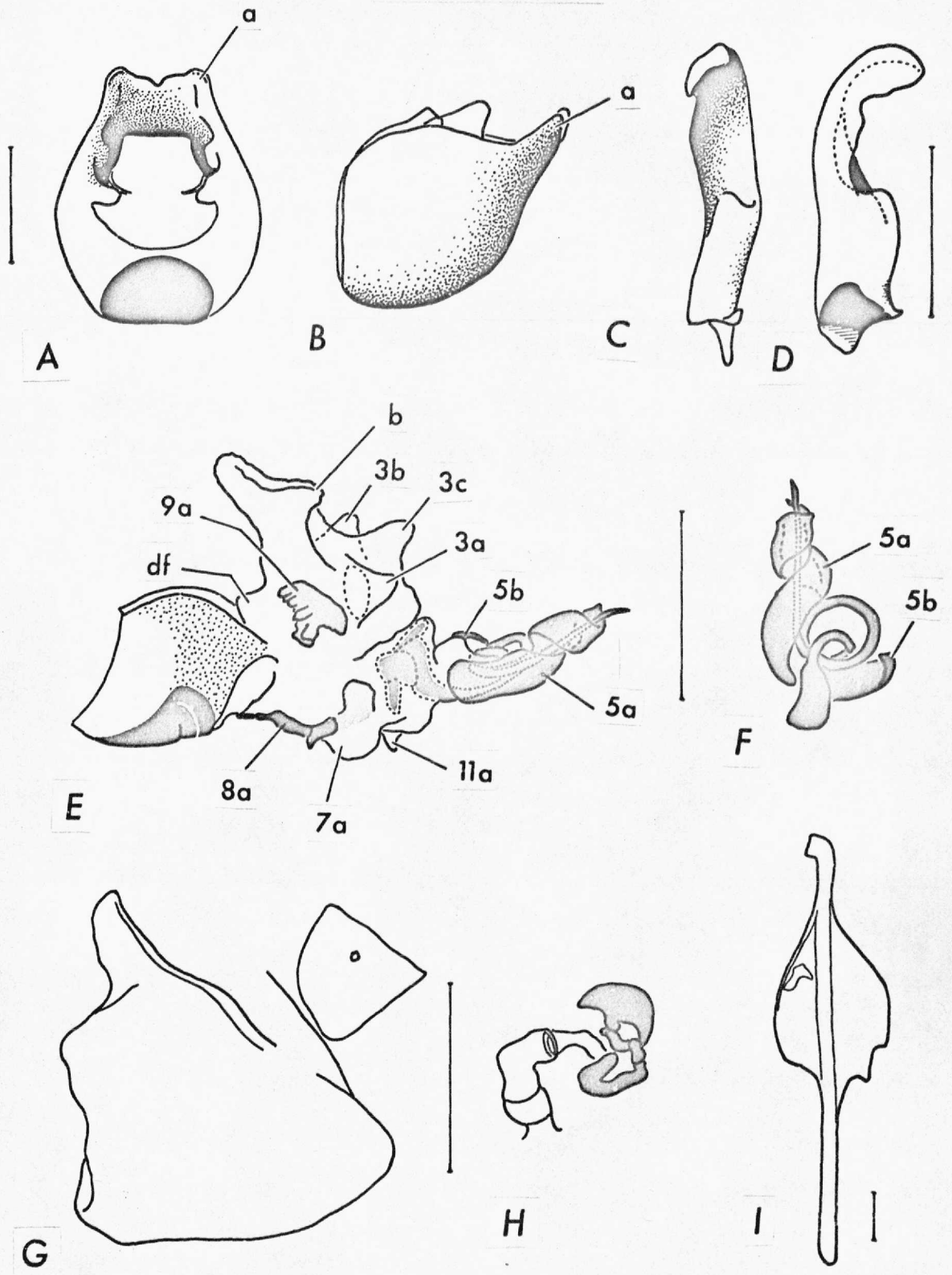


Table 40 Measurements (5 ♂♂ and 4 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.4–17.7	16.0	4	17.7–20.0	18.7
2 Head length	5	2.33–2.60	2.44	4	2.58–2.94	2.77
3 " width	5	2.05–2.28	2.15	4	2.24–2.47	2.37
Distance:						
4 inter-ocular	5	0.96–1.06	1.01	4	1.14–1.23	1.16
5 ante-ocular	5	1.02–1.10	1.05	4	1.17–1.38	1.24
Antennae:						
6 segm. I length	5	2.28–3.13	2.60	4	2.47–2.60	2.54
7 " II "	4	3.45–4.08	3.68	4	3.50–4.12	3.88
8 " III "	4	2.25–2.78	2.45	4	2.54–3.02	2.83
9 " IV "	3	3.88–4.56	4.23	1	3.93	3.93
Labium:						
10 segm. I length	4	2.09–2.28	2.19	4	2.28–2.96	2.53
11 " II "	4	1.93–2.28	2.12	4	2.09–2.75	2.41
12 " III "	4	1.14–1.25	1.18	4	1.33–1.48	1.39
13 " IV "	4	1.95–2.39	2.13	4	2.14–3.45	2.61
14 Pronotum length	5	2.73–3.21	2.95	4	3.12–3.84	3.56
15 " width	5	4.08–4.94	4.38	4	5.04–5.90	5.57
16 Scutellum length	4	1.82–2.14	1.94	4	2.29–2.58	2.44
17 " width	4	1.61–1.90	1.76	4	2.12–2.43	2.30
18 Hind tibia length	5	7.24–8.92	8.03	3	8.25–9.40	8.84
Tibial dilation:						
19 total width	5	1.44–2.30	1.76	3	1.96–2.97	2.45
external part:						
20 length	5	2.88–3.84	3.26	3	4.32–5.28	4.72
21 width	5	0.62–1.20	0.89	3	0.96–1.44	1.20
internal part:						
22 length	5	2.54–3.50	2.89	3	3.45–4.56	3.88
23 width	5	0.48–0.72	0.57	3	0.62–1.00	0.82
24 Undilated portion	5	3.02–3.84	3.34	3	2.20–3.50	2.86
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.18–6.80:1	6.55:1	4	6.39–7.27:1	6.75:1
1 / 18	5	1.90–2.20:1	1.99:1	4	2.06–2.12:1	2.11:1
2 / 3	5	1.11–1.16:1	1.13:1	4	1.11–1.21:1	1.16:1
6 / 2	5	0.97–1.22:1	1.06:1	4	0.84–0.96:1	0.91:1
10 / 2	4	0.87–0.91:1	0.89:1	4	0.81–1.00:1	0.91:1
9 / 6	2	1.04–1.75:1	1.67:1	1	1.59:1	1.59:1
15 / 16	4	2.14–2.39:1	2.26:1	4	2.20–2.28:1	2.25:1
20 / 18 %	5	37.5–43.0	40.5	3	45.9–59.4	53.3
22 / 18 %	5	34.3–39.2	35.9	4	36.7–51.3	43.4

Microphyllia harpagon (Fabricius) 1775 comb.n.

(Plate 41)

Cimex harpagon Fabricius, 1775: 717.101. NEOTYPE ♂ Brasil (NR), here designated [examined].

Cimex harpagon Fabricius: Goeze, 1778: 255.7; Fabricius, 1781: 361.139; 1787: 297.182.

Cimex harpator Gmelin, 1788: 2188.514 [incorrect subsequent spelling]

Lygaeus harpagon (Fabricius): Fabricius, 1794: 146.40; 1803: 215.81.

Anisoscelis sexmaculata Stål, 1859: 458. Holotype ♀ Brasil (RN) [examined, synonymized by Stål, 1870: 165]

Theognis erythrinus Mayr, 1865: 434. Holotype ♀ Brasil (NM) [examined, synonymized by Stål, 1870: 165].

Theognis erythinus Mayr: Mayr, 1866: 105, fig. 24.

Leptoglossus harpagon (Fabricius): Stål, 1870: 165.18; Lethierry & Severin, 1894: 47; Blöte, 1936: 28; Allen, 1969: 68 (excluding general description).

General and differential diagnosis: Wide orange patch behind ocelli; two large oval patches on posterior margin of pronotum; colour pattern of pleural region; shape of tibial dilation. Characteristic features of ♂♂: the shape of genital capsule and parameres; the tapering dorsal sac; the shape, size and position of processes 3a-b, shape and condition of

processes 9a-b, shape of processes 8a-b, and shape and size of process 5a. Those of ♀♀: The shape of Ist gonocoxa and shape and size of spermatheca.

M. harpagon shows certain affinities with M. fasciolata, M. alleni, M. pittieri and M. brasiliensis which is indicated by the shape of the spermatheca.

Description: Head. Basically shiny black, with two stripes lateral to ocelli and an elongate lateral patch extending over buccula, maxillary plate and gena, yellow ochre to orange brown. All labial segments yellow ochre to orange brown, usually with brown patches. First three antennal segments black, the IVth brownish grey. Tylus projecting above and anterior to juga forming a conspicuous keel between the jugae but occasionally reduced to a ridge between jugae; the latter with curved external margin and straight median margin. Labium not reaching beyond the IIIrd sternite. Thorax. Pronotum, scutellum and corium basically black with metallic pale green shine and with the following orange markings: On pronotum - wide patch behind calli, extending over most of central area of pronotum, and apparently formed by the fusion of two rounded patches; two large oval patches on posterior margin of pronotum. On corium - an oval transverse patch on vein m-cu. Veins of corium sometimes partially tinged with dark reddish brown. Pleural region basically yellow orange, orange or orange brown, and with the following black markings: On propleural region - a small patch above supracoxal lobes, and occasionally one small patch on postepimeral flange I. On mesopleura - an irregular patch occupying the central part of pleura. On metapleura -

a corner of pleura and occasionally a wide median patch just anterior to the postepimeral flange III. Sternal region black; on prosternum the black colouration is restricted to the central area only. All legs basically black, distal half of hind femur usually with a yellow ochre annulus which occasionally is incomplete and restricted to the internal face only. Tibial dilation with white patch on basal half of internal dilation and on the external dilation a small one close to the main shaft of tibia. Pronotal calli elevated, pronotum declivent, densely and deeply punctated; humeral areas horizontal slightly below the level of the disk; humeral angles obtuse usually horizontal, occasionally slightly elevated; posterior margin of pronotum usually straight, sometimes slightly concave. Hind tibia (fig. I) with external and internal dilation approximately as long as wide, external one with pronounced emarginations and conspicuous teeth. Abdomen. Tergites basically black with two large rounded spots on each scent gland scar and the anterior part of each connexival segment yellow orange. Sternites and first gonocoxa and laterotergites in females yellow orange to orange brown with the following black markings: posterior half of each sternite; rounded to suboval patches below and slightly behind each spiracle, on sternites V to VIII these patches cover the area of trichobothria; area of sternites II to IV level with third coxa. Genital capsule in males black.

Male genitalia: Genital capsule (fig. A,B) - posterior margin below the level of lateral margins, with deep quadrate notch, without prongs; lateral margins straight, almost horizontal. Paramere (fig. C,D) - shaft with small outer lobe, shank almost straight, terminating in a short,

wide and flat hook. Phallus (fig. E) - conjunctive with elongate and tapering dorsal sac, the apex of the latter with two small, flat lateral lobes (b); conjunctiva armed with the following processes: 3a-b membranous, large, rather narrow, terminating in a weakly sclerotized tip; 9a-b moderately sclerotized, flat and somewhat directed posteriorly; 8a-b heavily sclerotized, subhorizontal, each with two flat anterior projections, the internal blunt and the external acute; 7a-b projecting dorsally; 11a-b membranous, 11a reduced and subacute, 11b blunt, 5a (fig. E,F) with first convolution ventrally sinuate.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca fig H with fusiform duct dilation.

Measurements and Ratios: (see table 41)

Geographical distribution: (Map 15) Most of the material examined was collected in the northern part of South America (French Guiana, Surinam and western part of Venezuela), and also in Brasil (Sao Paulo), but the two specimens from Brasil, mentioned by Allen 1969: 70 as harpagon are in fact referable to M. brasiliensis sp.n.

Habitat and Biology: During the dissections, two females were found with developed eggs, one of them from French Guiana was without the date of collection, and the other from Surinam, was collected on 19 November 1948; the eggs are subcylindrical with one side flat, length = 1.52mm, width = 1.08mm, height = 0.85mm.

Discussion: Two different forms are present in this species, one dark reddish brown (see Allen, 1969: 68) to which the types of A. sexmaculata Stål and T. erythrinus Mayr belong, and a black form on which the present redescription of the species was based. Detailed examination of external morphology and genitalia of both forms showed that except for an overall reduction in size of the brown form, there are no sufficiently significant differences to consider these forms as different species; the subspecific rank also does not appear to be quite appropriate, because neither of the two forms seems to be associated with a separate geographical area, both being collected together in the same locality in Surinam. At present these two forms are considered to represent individual variation, and only further extensive collection of new material may clarify the actual relationships between these two forms.

Material examined.

a) Type material: Neotype of Cimex harpagon Fabricius. This type was not found in Fabricius' collection in UZM nor in the Bank's collection in BMNH and apparently is lost. Fabricius' description is very brief and may refer to several species of Microphyllia. Specimens of L. flavorignatus and particularly of the new species M. alleni and M. brasiliensis have been frequently misidentified as M. harpagon. For this reason it is obvious that in the interest of stability of nomenclature, a neotype for Cimex harpagon should be designated. In the course of this study, a male specimen from Brasil, Sao Paulo in NR was

chosen as neotype and accordingly labelled. This specimen fully agrees with Fabricius' original description and also with subsequent synonymy given by Stål.

Holotype ♀ of Anisoscelis sexmaculata Stal from Brasil, labelled "Typus, Anisoscelis sexmaculata Stal, M. Berl" in NR collection. Holotype ♀ of Theognis erythrinus Mayr from Brasil, labelled "Brasillien, Natterer, erythrinus det. Mayr" in NM collection.

b) Other material: BRASIL: Sao Paulo, Piracicaba, 1 ♀ (ZI); Sao Paulo, 1 ♂ (NR). FRENCH GUIANA: 1899, R. Obertur, 2 ♀ (MNHN). SURINAM: Wia wia Km 38 Ritsenbos, 19-22 - XI - 1948, Surinam Exp. 1948-9, 4 ♂, 1 ♀ (RNH). VENEZUELA: Barinas, Reserva Forestal Ticoporo, 230m, on light, 3-10 - IV - 1966, F. Fernández Yépez, L.J. July, 3 ♂ (IZA).

Plate 41

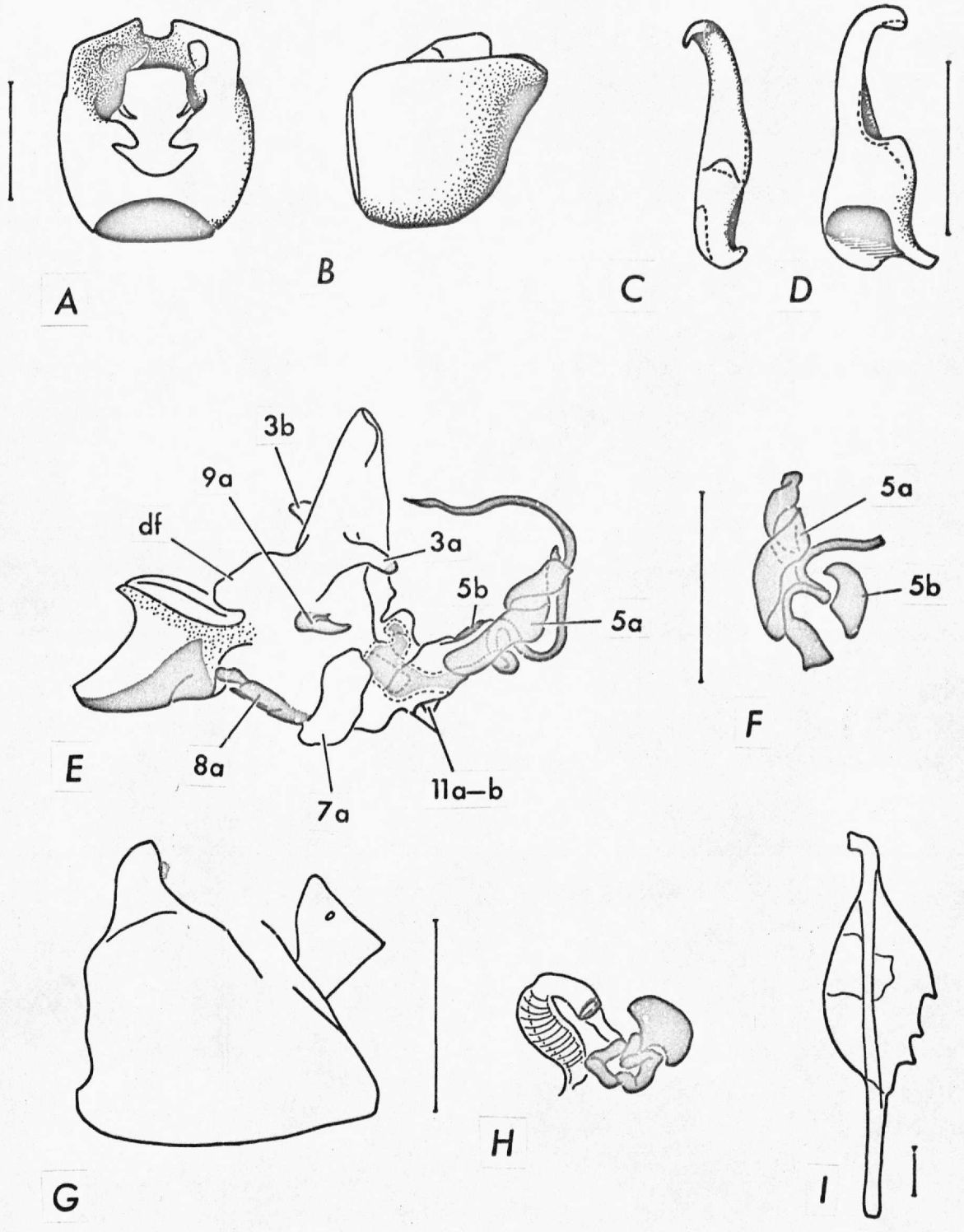


Table 41 Measurements (5 ♂♂ and 5 ♀♀ from 5 localities) in millimetres:

	Characters:	Males			Females		
		No.	Range	Mean	No.	Range	Mean
1	Body length	5	14.7-16.0	15.0	5	13.0-18.5	16.5
2	Head length	5	2.28-2.47	2.39	5	2.43-2.75	2.61
3	" width	5	1.99-2.16	2.09	5	2.05-2.33	2.23
	Distance:						
4	inter-ocular	5	0.96-1.04	1.00	5	1.10-1.23	1.16
5	ante-ocular	5	1.08-1.10	1.08	5	1.14-1.33	1.23
	Antennae:						
6	segm. I length	5	2.28-2.49	2.39	5	1.90-2.39	2.15
7	" II "	5	3.55-4.08	3.87	5	2.78-3.98	3.49
8	" III "	5	2.68-3.02	2.90	5	2.11-3.12	2.66
9	" IV "	5	2.40-4.80	3.94	5	3.12-4.56	4.02
	Labium:						
10	segm. I length	5	2.22-2.39	2.28	5	2.03-2.66	2.41
11	" II "	5	2.09-2.28	2.20	5	1.90-2.51	2.33
12	" III "	5	1.14-1.23	1.17	5	1.14-1.33	1.27
13	" IV "	5	2.18-2.33	2.27	5	1.93-2.75	2.44
14	Pronotum length	5	2.73-3.12	2.95	5	1.00-3.69	2.92
15	" width	5	4.22-4.46	4.32	5	1.61-5.66	4.46
16	Scutellum length	5	1.74-1.90	1.82	4	1.93-2.37	2.17
17	" width	5	1.71-1.86	1.78	4	2.03-2.31	2.18
18	Hind tibia length	5	7.68-8.16	7.98	3	6.91-8.73	8.01
	Tibial dilation:						
19	total width	5	1.92-2.35	2.07	4	1.72-2.35	2.08
	external part:						
20	length	5	3.88-4.32	4.06	4	3.36-4.75	4.17
21	width	5	0.84-1.15	1.01	4	0.80-1.20	1.03
	internal part:						
22	length	5	3.45-3.84	3.67	4	3.26-4.65	3.87
23	width	5	0.68-0.80	0.72	4	0.56-0.76	0.71
24	Undilated portion	5	2.40-2.78	2.60	4	2.20-2.83	2.52
	Ratios: (figures refer to character numbers above).						
	1 / 2	5	5.95-6.75:1	6.27:1	5	5.34-6.95:1	6.32:1
	1 / 18	5	1.83-1.96:1	1.87:1	3	2.06-2.25:1	2.18:1
	2 / 3	5	1.09-1.19:1	1.14:1	5	1.09-1.21:1	1.12:1
	6 / 2	5	0.92-1.05:1	1.00:1	5	0.76-0.89:1	0.82:1
	10 / 2	5	0.89-1.00:1	0.95:1	5	0.83-1.00:1	0.92:1
	9 / 6	5	1.05-1.92:1	1.64:1	5	1.63-1.93:1	1.86:1
	15 / 16	5	2.29-2.48:1	2.37:1	4	2.33-2.40:1	2.38:1
	20 / 18 %	5	48.7-53.9	50.8	3	48.6-56.5	52.0
	22 / 18 %	5	45.1-47.9	45.9	3	46.1-53.2	48.3

Microphyllia flavosignata Blöte (1936) comb.n

(Plate 42)

Leptoglossus flavorignatus Blöte, 1936: 28. Holotype ♀, Surinam (RNH) [locality here restricted, examined].

Leptoglossus flavosignatus Blöte: Allen, 1969: 70.

General and differential diagnosis: Yellowish white annulus on tibia and the shape and size of tibial dilation. Characteristic features of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

M. flavosignata shows very distinctive characters unique within the genus, which distinguish it from the other species of Microphyllia.

Description: General characters see Allen, 1969: 70.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G, spermatheca (fig. H) rudimentary, globuliforme, with narrow distal spermathecal duct.

Measurements and Ratios: (see table 42).

Geographical distribution: (Map 15) Only known from Surinam.

Discussion: The three females examined from Surinam are much darker

than the holotype; one specimen has the pronotum, scutellum and corium basically black, and the veins of corium and clavus are partially or totally tinged with dark red.

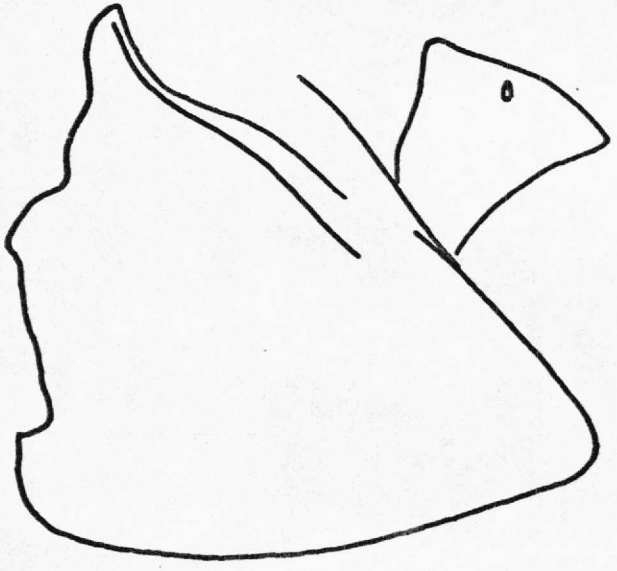
Among the material examined there were three females from three different localities in Peru whose genitalia resemble very closely the genitalia of M. flavosignata, the only difference noticed was the rather more coiled distal part of spermathecal duct; externally they differ in their brown colour, rather smaller thoracic orange spots, and the elongate patch on corium which extends almost across the whole width of corium. At present the exact relationships between M. flavosignata and this form can not be established.

Material examined.

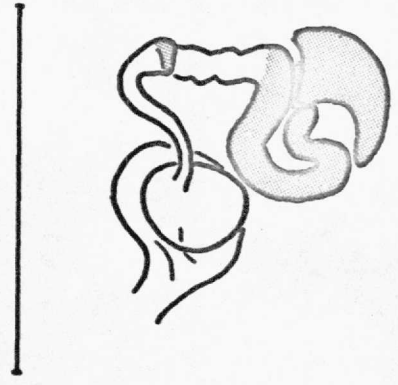
a) Type material: Holotype ♀ of Leptoglossus flavosignatus Blöte, labelled "holotypus, flavosignatus Blöte, Amer. mer." and with two identification labels. The type locality originally given as "America meridionalis" is here restricted to Surinam. As there are no records of this species from countries other than Surinam, it seems likely that the holotype may have been also collected there.

b) Other material: SURINAM: Paramaribo, IX - X - 1962, P.H.v. Doesburg Jr., 2 ♀ (RNH); s.l., 3 - XII - 1958, s.c., 1 ♀ (RNH).

Plate 42



G



H

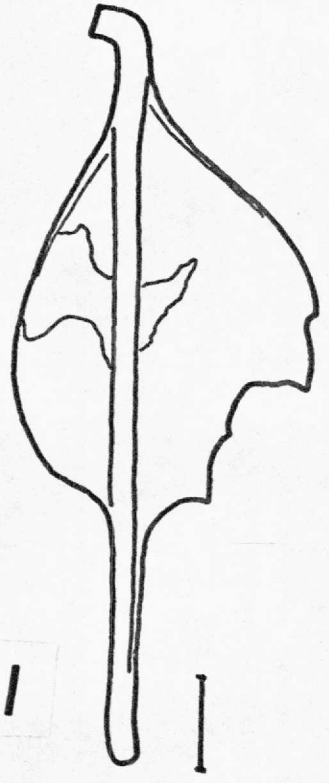


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Table 42 Measurements (4 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	–	—	—	4	16.0–18.4	17.4
2 Head length	–	—	—	4	2.49–2.87	2.66
3 " width	–	—	—	4	1.84–2.41	2.21
Distance:						
4 inter-ocular	–	—	—	4	1.10–1.19	1.15
5 ante-ocular	–	—	—	4	1.17–1.23	1.19
Antennae:						
6 segm. I length	–	—	—	4	2.39–2.66	2.50
7 " II "	–	—	—	4	3.84–4.32	4.05
8 " III "	–	—	—	4	2.83–3.12	2.98
9 " IV "	–	—	—	4	4.41–5.04	4.74
Labium:						
10 segm. I length	–	—	—	4	2.49–2.77	2.61
11 " II "	–	—	—	4	2.31–2.56	2.39
12 " III "	–	—	—	4	1.14–1.33	1.26
13 " IV "	–	—	—	4	2.31–2.49	2.39
14 Pronotum length	–	—	—	4	3.21–3.64	3.51
15 " width	–	—	—	4	4.94–5.47	5.27
16 Scutellum length	–	—	—	4	2.28–2.47	2.38
17 " width	–	—	—	4	2.03–2.31	2.15
18 Hind tibia length	–	—	—	4	8.16–9.60	9.01
Tibial dilation:						
19 total width	–	—	—	4	3.16–3.50	3.34
external part:						
20 length	–	—	—	4	5.04–5.90	5.50
21 width	–	—	—	4	1.72–1.92	1.83
internal part:						
22 length	–	—	—	4	4.56–5.28	4.92
23 width	–	—	—	4	0.96–1.20	1.09
24 Undilated portion	–	—	—	4	2.64–2.78	2.72
Ratios: (figures refer to character numbers above).						
1 / 2	–	—	—	4	6.35–6.69:1	6.54:1
1 / 18	–	—	—	4	1.82–2.15:1	1.93:1
2 / 3	–	—	—	4	1.11–1.44:1	1.20:1
6 / 2	–	—	—	4	0.86–1.00:1	0.93:1
10 / 2	–	—	—	4	0.93–1.04:1	0.98:1
9 / 6	–	—	—	4	1.78–2.10:1	1.89:1
15 / 16	–	—	—	4	2.13–2.31:1	2.21:1
20 / 18 %	–	—	—	4	54.4–65.0	61.0
22 / 18 %	–	—	—	4	51.9–58.8	54.6

LEPTOGLOSSUS Guérin gen. rev.

(Plates 43 - 47)

Leptoglossus Guérin-Méneville 1831 (1938), pl. 12, fig. 9; 1838: 174.

Type-species: Leptoglossus dilaticollis Guérin-Méneville, by monotypy.

Leptoglossus Guérin-Méneville: Stål, 1870: 160; Distant, 1881: 123; Kirkaldy, 1906: 257; Gibson, 1917: 69; Gibson & Holdridge, 1918: 3; Allen, 1969: 45.

[Anisoscelis Latreille; Spinola, 1837: 200. Misidentification]

Diagnosis: Body robust, medium to long. Head. Dorsal surface either entirely black with brownish patches, or reddish brown, usually with black patches; all segments of antenna tan, the IVth sometimes yellowish white. Porrect depressed behind ocelli, tylus and juga above the level of antenniferous tubercles; ratio length of head to inter-ocular distance 2.28:1 to 3.42:1; Ist antennal segment shorter than head; labium variable in length, from short reaching only the middle of IIIrd, to long extending up to the middle of the VIIth sternite. Thorax. Pronotum, scutellum and corium dark reddish brown to dark brown; corium with or without a transverse yellowish patch; pleural region usually with numerous small black spots; pro and mesosternum black. Pronotum anteriorly steeply declivent, occasionally almost vertical; surface of pronotum coarsely

sculptured with large faveolae and deep punctures or occasionally rugulose; calli with different sculpture from the disk; humeral areas usually expanded into prominent wide and long lateral processes, but occasionally broadly rounded (1 species) or produced into long tapering process (1 species), margins of the expansions and the lateral margins of pronotum usually with spines and large teeth, occasionally with only small teeth; posterior margin straight and slightly depressed. Scutellum usually wider at base than long, transversely rugulose, with two transverse raised portions, one at base and the other in the middle, and with thick marginal ridges. Hind tibia (fig. I) with lanceolate not emarginated tibial dilation of variable length. Abdomen. Tergites with a median longitudinal pale yellow band extending from Ist to VIIth tergite, occasionally absent on the Ist tergite, and usually wider over the scent gland scars; sternites usually with (occasionally without) numerous small black spots.

Male genitalia: Genital capsule (fig. A,B) - without subproctigeral sac; posterior margin with median notch variable in shape and size; dorsal prongs variable in shape, occasionally absent; lateral margins posteriorly expanded, usually flared. Paramere (fig. C,D) - shaft flattened laterally, with wide base, without outer lobe or distal cavity, sometimes expanded dorsally or dorso-laterally; shank narrow variable in length, strongly curved dorsally or occasionally dorso-medially, and produced into a short apical hook usually with small medial subapical projection. Phallus (fig.E) - phallotheca slightly sclerotized laterally; conjunctiva with the dorsal sac without sclerotizations and variable in shape and size, sometimes asymmetrical; with the following processes: 3a-b

membranous, variable in shape and size, 4a-b membranous, occasionally absent; 9a-b at least in part heavily sclerotized, with a truncate or blunt tip; 8a-b heavily sclerotized, each with two anterior projections, the external flat usually blunt, and the internal smaller and acute; 7a-b membranous occasionally weakly sclerotized; 5a (fig. E,F) - short and thick with only two complete convolutions.

Female genitalia: Spermatheca (fig. H) with large duct dilation, usually elongate-oval with narrow and short base; spermathecal bulb sometimes projecting at both extremities.

Pubescence: Body except dorsal area of meso and metanotum and dorsal surface of abdomen covered with numerous, short and delicate whitish hairs.

Geographical distribution: (Map 16) Known from Neotropical and Nearctic region, but the existing records are rather fragmentary and incomplete. Often the localities of occurrence of the species of this genus are widely separated from each other by vast, ecologically similar areas from which so far they have not been recorded.

Discussion: The genus Leptoglossus was established by Guérin in 1831, with L. dilaticollis as the only included species. Theognis was established by Stål in 1862, but later, in 1870 synonymized by himself with Leptoglossus, thus raising the total number of species in the genus to 24. Lethierry & Severin in 1894 in their catalogue included 35 species in this genus, many of which are now known to be synonyms of other species. In 1935 Kiritshenko reversed Stål's action and re-erected Theognis as a

genus distinct from Leptoglossus leaving only dilaticollis in the latter. According to Kiritshenko the bases for separation of the two genera were: (1) Humeral angles of pronotum produced in long anteriorly curved processes. (2) All lateral margins strongly dentate. (3) Pronotum with deeply excavated rounded faveolae; (4) Body robust, very long (length 27-29mm). (5) Length of the head three times the interocular distance. Hussey (1953) accepted Kiritshenko's action, but recently Allen (1969) rejected the validity of this separation and all the species placed in Theognis assigned to Leptoglossus, but divided them into several groups of species. In general I agree with Allen's recognition of the groups of species within the genus, but in my opinion some of the groups deserve higher rank. I am therefore proposing the following classification of Leptoglossus sens. lat. According to my observations in this study, the genus Leptoglossus sens. lat. in fact represent a group of 7 genera, four of them are already known i.e. Leptoglossus sens. str., Theognis, Microphyllia and Narnia (the last two described by Stål); in addition to these I am suggesting three new genera: Stalifera, Fabrictilis and Veneza. Microphyllia and Narnia always have been regarded as genera distinct from Leptoglossus sens. lat., but in my opinion they belong to the Leptoglossus group of genera as here conceived. This conclusion is based on the characters of male and female genitalia as well as on the other relevant external characters. To establish this classification of the genus, it was necessary to clarify and revaluate the relationship between the species within the Leptoglossus group of genera, and to redefine the limits of the groups of species recognized by Allen and their relationships with the other genera of

Anisoscelini. The details of this will be given in the diagnosis of and discussion on the individual genera. Perhaps my main motivation for questioning the conseption and past status of Leptoglossus sens. lat., was the discovery of two new species closely related to dilaticollis, which together with the latter and two already known species, clearly form a distinct group of generic rank. Some of the groups of species suggested by Allen correspond exactly with the genera as here recognized; the others it was necessary to redefine their limits. This conceived genera of Leptoglossus group of genera appears to have the same toxonomic status as the already recognized genera in the Anisoscelis group of genera.

KEY TO SPECIES

1 Humeral areas of pronotum expanded into a broad and long lateral processes, margins of the latter and lateral margins armed with large teeth, occasionally rounded tubercles; transverse patch on middle of corium; two short light brown stripes behind ocelli.....2

\- Humeral areas not as above, margins of pronotum with small stout teeth; corium without transverse patch; without two stripes behind ocelli.....4

2 (1) Pronotum with faveolae, tibial dilation short not extending over more than 68% ($\frac{2}{3}$) of length of tibia.....3

\- Pronotum not faveolate, tibial dilation extending over 83% (about 4/5th) of length of tibia.....distanti (p.395)

3 (2) With very conspicuous, large, rounded and deep black faveolae; scattered black spots on corium, comparatively wide and long humeral lateral processes; comparatively long undilated part of hind tibia.....faveolatus (p.389)

- With conspicuous rounded shallow faveolae; without black spots on corium; comparatively narrow and short humeral processes; comparatively short undilated part of hind tibia.....
.....dilaticollis (p.382)

4 (1) Humeral areas of pronotum expanded into long, tapering, lateral processes; pronotum with dense and deep uniform punctation; length of undilated part of hind tibia 1.48 - 1.97 (1.64)mm..
.....rubroscens (p.406)

- Humeral areas expanded into short rounded processes; pronotum coarsely punctate almost rugulose; length of undilated part of hind tibia = 2.49 - 2.97 (2.64)mm.....fulvicornis (p.400)

Leptoglossus dilaticollis Guérin, 1831

(Plate 43)

Leptoglossus dilaticollis Guerin, 1831, pl. 12, fig. 9, 1938: 174. Holotype ♀, Brasil (MNHN) [type rediscovered, examined].

Leptoglossus dilaticollis Guerin: Stål, 1870: 161.1; Lethierry & Severin, 1894: 47; Distant, 1902: 382; Kirkaldy, 1906: 257; Kiritschenko, 1935: 191; Blöte, 1936: 28; Costa Lima, 1940: 85, fig. 292; Dupuis, 1952: 449; Hussey, 1953: 33; Allen, 1969: 40, fig. 1.

General and differential diagnosis: Pronotum with conpsicuous rounded shallow faveolae; humeral areas expanded into broad and long lateral processes; margins of the latter and lateral margins of pronotum armed with conspicuous though comparatively short spines, and with obtuse to subacute, occasionally rounded teeth; length of undilated part of hind tibia 3.84 - 4.80 (4.20)mm. Characteristic features of ♂♂: shape and size of genital capsule and paramere, and the shape and size of dorsal sac and the processes 3a, 4a-b, 21a, 9a-b and 5a. Those of ♀♀: shape of Ist gonocoxa, and shape and size of spermatheca. L. dilaticollis shows close relationships with L. faveolatus and L. distanti , the relationship between these three species is indicated by similarity of the humeral area of pronotum, transverse yellowish patch on the middle of corium, and two short brownish stripes behind the ocelli (see differential diagnosis of these two species).

Description: General characters see Allen 1969, p.79.

Male genitalia: Genital capsule (fig. A,B) - posterior margin below the level of lateral margins,with a shallow median notch; the bottom of the latter (a) with a wise, raised swelling divided into two globular halves by a shallow longitudinal suture; dorsal prongs (b) not very conspicuous, sometimes blunt, directed posteriorly; lateral margins gradually raised dorso-laterally, with obtuse posterior projections. Paramere (fig. C,D) - gradually tapering distally, with a short shank terminating in a curved hook; shank without median lobe. Phallus (fig. E) - phallotheca slightly sclerotized laterally; conjunctiva with slender,

asymmetrical, laterally deflected dorsal sac and armed with the following processes: 3a membranous in form of a wide bulge; 4a-b membranous, prominent and directed upwards, 4b slightly larger than 4a; 21a small and membranous; 9a-b heavily sclerotized, thick, apically blunt, 8a-b heavily sclerotized, subhorizontal, each with two anterior projections, the internal one flat and acute and the external flat and blunt; 7a-b membranous, wide and flat, with minute sclerotized areas; 5a (fig. E,F) short and thick, with two convolutions, the second one almost as long as the first.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig, H) short with both the dilated portion of the duct and the base wide.

Measurements and Ratios: (see table 43)

Geographical distribution: (Map 16) Restricted only to the southern part of Brasil, collected in the following states: Rio de Janeiro, Sao Paulo, Minas Geraes and Rio Grande do Sul. Allen (1969) reported two specimens from Panama and Mexico respectively, but in my opinion the specimen from Panama after detailed morphological examination and dissection of genitalia represents a different species and its description is given later; the specimen from Mexico, although not examined, appears to be conspecific with it.

Habitat and Biology: L. dilaticollis has been collected at altitudes between 200 to 1000m; the record of the date of collection in September, was given to only one of the 11 available specimens; Da Costa Lima has

reported it as occurring on "cacaueiro" Theobroma sp and Magnolia sp.

Discussion: The most important variations observed in the examined material, were as follows: the leveling of the humeral areas might vary from the usual slightly declivent anteriorly, to horizontal and occasionally even slightly ascending; external margin of external tibial dilation normally with three well developed spines, but their number might vary from one to four; the presence of small spine-like teeth on margins of undilated portions and on entire length of dorsal margin of hind tibia, as described by Allen (1969), is not only a variable character of the species, but expresses sexual dimorphism being present only in the males and are totally absent in females.

Material examined.

a) Type material: Holotype ♀ of Leptoglossus dilaticollis Guérin, from Brasil, Sao Paulo, in MNHN collection, labelled "Du midi de la Cap de St. Paul, Leptoglossus dilaticollis Guer. Voy. de Duperrey, pl. 12, f.9". The specimen was pinned on another label "Leptoglossus Amyot. dilaticollis Guer. Voy. Dup. pl. 12, f.9 - Brasil", but this label was probably the heading label of dilaticollis in the original box of Amyot and Serville collection; the specimen was rediscovered in this box among the mixed material of Coreidae.

b) Other material: BRASIL: Boucard, 1 ♀ (NR); 1 ♀ (UM), Rio Grande do Sul, 1 ♂ (RNH); s.l., 1 ♀ (NR); s.l., 1 ♂ (TM); Sao Paulo, 1 ♀ (RNH); Sao Paulo, Piracicaba, 1 ♂ (ZI); Minas Geraes, Uberaba, E. le Moult,

2 ♂, 1 ♀ (RNH); Petropolis, 26 - IX - 1898, 1 ♂ (IZA).

c) Material without data: 1 ♀, labelled "M. Berl" (NR).

Plate 43

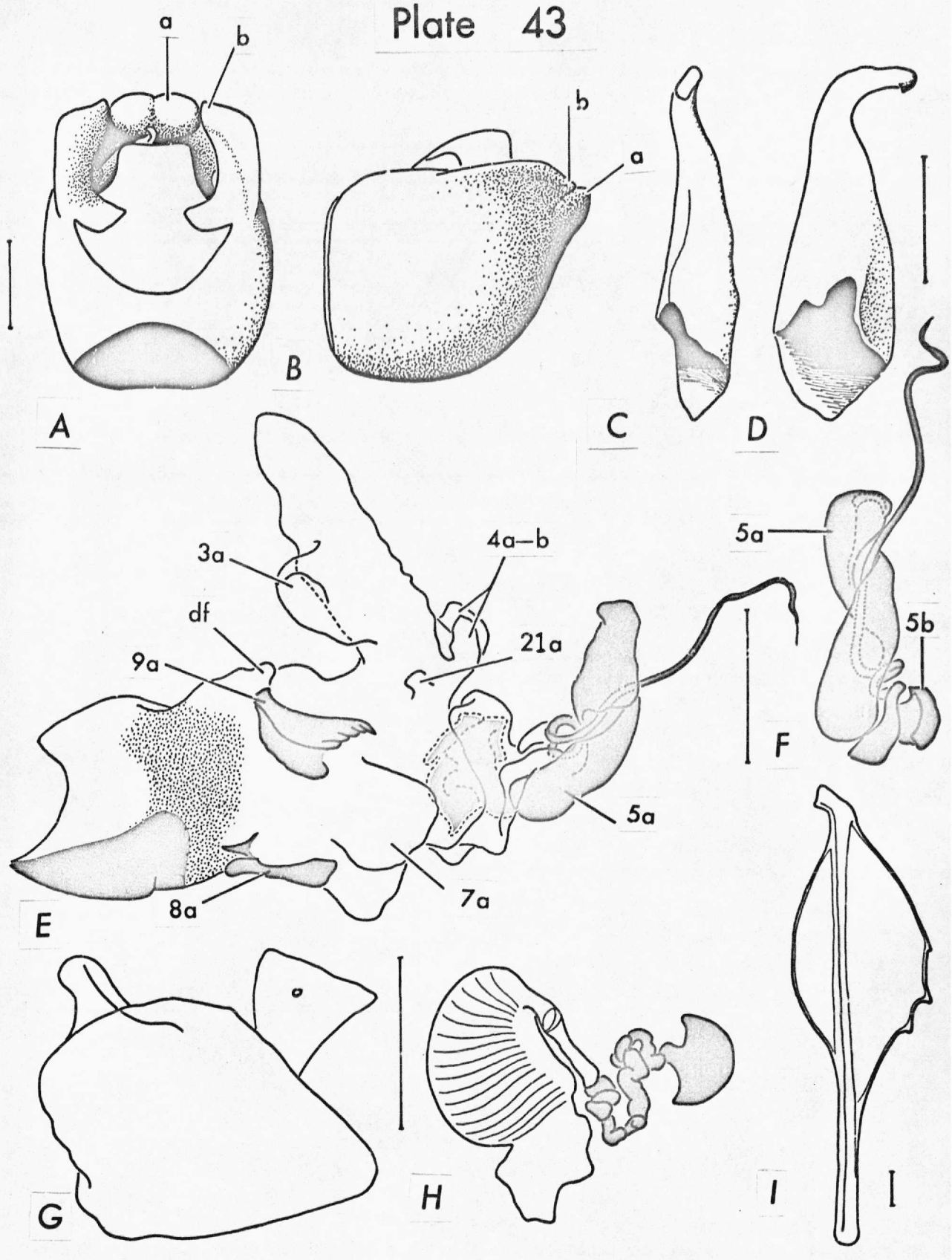


Table 43 Measurements (5 oo and 5 ^{oo} from 4 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	27.8-30.6	29.3	5	30.0-35.0	32.6
2 Head length	5	4.65-5.04	4.85	5	4.80-5.76	5.26
3 " width	5	2.73-2.97	2.85	5	2.97-3.16	3.07
Distance:						
4 inter-ocular	5	1.58-1.68	1.62	5	1.68-1.77	1.70
5 ante-ocular	5	2.54-2.68	2.60	5	2.64-2.97	2.76
Antennae:						
6 segm. I length	4	3.21-3.60	3.37	5	3.12-3.69	3.39
7 " II "	4	5.66-6.52	6.09	4	5.28-7.39	6.32
8 " III "	4	4.32-5.37	4.82	4	4.12-5.42	4.73
9 " IV "	1	7.20	7.20	1	7.82	7.82
Labium:						
10 segm. I length	5	4.89-5.52	5.22	4	5.32-5.76	5.50
11 " II "	5	5.42-6.06	5.77	4	5.52-6.33	5.93
12 " III "	5	3.55-4.32	4.03	4	3.69-4.80	4.21
13 " IV "	5	7.05-9.60	8.40	4	7.53-9.79	8.29
14 Pronotum length	5	4.84-5.27	5.27	5	5.76-6.43	6.01
15 " width	5	14.0-16.0	14.9	5	15.7-18.0	16.9
16 Scutellum length	5	2.88-3.36	3.11	5	3.31-3.89	3.53
17 " width	5	3.12-3.74	3.47	5	3.79-4.46	3.98
18 Hind tibia length	5	12.2-14.5	13.3	4	12.5-15.4	13.8
Tibial dilation:						
19 total width	5	7.58-8.92	8.22	4	8.11-10.3	9.29
external part:						
20 length	5	1.68-1.92	1.77	4	16.8-20.6	18.5
21 width	4	5.90-6.96	6.43	4	6.72-8.16	7.12
internal part:						
22 length	4	0.96-1.15	1.04	4	1.10-1.34	1.22
23 width	5	3.02-3.60	3.38	4	3.36-4.03	3.66
24 Undilated portion	5	3.84-4.80	4.20	4	3.36-4.56	3.89
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.86-6.14:1	6.04:1	5	5.53-6.62:1	6.01:1
1 / 18	5	2.08-2.29:1	2.20:1	4	2.15-2.48:1	2.36:1
2 / 3	5	1.67-1.72:1	1.70:1	5	1.61-1.82:1	1.71:1
6 / 2	4	0.65-0.71:1	0.68:1	5	0.61-0.66:1	0.64:1
10 / 2	5	1.00-1.12:1	1.07:1	4	1.00-1.10:1	1.07:1
9 / 6	1	2.00:1	2.00:1	1	2.11:1	2.11:1
15 / 16	5	4.61-5.06:1	4.79:1	5	4.62-5.07	4.78:1
20 / 18 %	5	60.8-63.3	61.8	4	66.8-68.3	67.3
22 / 18 %	5	46.6-48.0	48.3	4	48.3-53.7	51.5

Leptoglossus faveolatus sp.n

(Plate 44)

General and differential diagnosis: Faveolae of pronotum and several scattered spots on scutellum and corium, black; pronotum with very conspicuous, large, rounded and deep faveolae; humeral areas expanded into comparatively broad and long lateral processes; margins of the latter and lateral margins of pronotum armed with very conspicuous thick spines and large acute teeth; length of undilated part of hind tibia = 5.42 - 5.95 (5.68)mm. Characteristic features of ♂♂: shape and size of genital capsule and paramere, and the shape and size of dorsal sac and the processes 3a-b, 4a-b, 9a-b and 5a.

L. faveolatus resembles L. distanti and particularly L. dilaticollis; with dilaticollis it shares the following characters: pronotum with faveolae, humeral areas of pronotum expanded into broad and large lateral processes; tibial dilation short, not extending over more than 68% ($\frac{2}{3}$) of the length of tibia. L. faveolatus can be distinguished from L. dilaticollis by: numerous very conspicuous, large, rounded and deep black faveolae; the presence of scattered black spots on scutellum and corium; comparatively wider and longer humeral lateral processes armed with acute stout spines and tubercles. From L. dilaticollis it differs also by the longer undilated part of hind tibia, and from L. distanti by the shorter tibial dilation.

Description: (based only on males). Head. Dorsal surface and gula black; lateral surface and two dorsal short stripes behind ocelli light brown; the former with several spots and a patch just before the eye black. First labial segment light brown, the others tan with a black band on the anterior medial surface; distal part of the IVth black. First three antennal segments tan, the IVth yellowish white. Tylus blunt and prominent, forming a rounded and elevated ridge in front and between juga; the latter slender, tapering anteriorly, with straight median margin. Labium not reaching beyond the middle of Vth sternite. Thorax. Pronotum, scutellum and corium dark reddish brown; the teeth and spines on margins of pronotum, pronotal faveolae, several spots scattered on scutellum and corium, black; corium with broad straight transverse dull yellow patch. Lateral and ventral surfaces light brown with numerous small black spots; pro and mesosternum black. Fore and middle legs dark yellow ochre to light brown; coxa of both legs with dark brown to black patches; spines of femur of both legs black. Hind legs light reddish brown; femur darker distally, with spines entirely or at least apically black; coxa with black patches; trochanter dark brown; posterior surface of tibial dilation dark brown with margins and main shaft paler; anterior surface of tibial dilation light brown tinged with black; undilated portion of tibia tan. Pronotal calli somewhat elevated; pronotum steeply declivent, with numerous very conspicuous, large, rounded and deep faveolae, and with small punctures; lateral margins and humeral areas expanded into broad and long horizontal, anteriorly projecting lateral processes; margins of the latter and lateral margins of pronotum armed with very conspicuous stout spines;

posterior margin straight. Hind tibia (fig. I) with lanceolate tibial diltaion, extending over about 58% (3/5th) of the length of tibia. Abdomen. Tergites dark brown to black, with a median longitudinal band yellow ochre; connexivum, brown to dark brown. Sternites and genital capsule in males light brown, with numerous black spots, usually fused together on median parts of sternites thus forming larger patches.

Male genitalia: Genital capsule (fig. A,B) - posterior margin below the level of lateral margins, with a shallow median notch; the bottom of the latter (a) with comparatively narrow, rather well raised swelling divided into two somewhat globular halves by a shallow longitudinal suture; dorsal prong (b) not very conspicuous, directed posteriorly; lateral margins somewhat sinuate and elevated dorso-laterally, with rounded posterior projections. Paramere (fig. C,D) - gradually tapering distally with the shank with sudden deflection of its dorsal margin to form a constricted shank; shank terminating in a curved hook, without median lobe. Phallus (fig. E) - phallotheca slightly sclerotized laterally; conjunctiva with a short asymmetrical dorsal sac; armed with the following processes: 3a-b membranous, widely expanded; 4a membranous, reduced, considerably smaller than lobe 4b; the latter very large forming a broad vertical membranous bulge almost reaching the apex of the dorsal sac; 21a membranous and slightly larger than lobe 4a; 9a-b heavily sclerotized with horizontal, flat and wide tip; 8a-b heavily sclerotized, subhorizontal each with two anterior projections, the internal one flat and acute and the external flat and blunt; 7a-b membranous, well developed, with the ventro-lateral area very undulated and somewhat denser; 5a (fig. E,F)

short and thick with two convolutions, the second one almost as long as the first.

Female genitalia: No female specimens were available for study.

Measurements and Ratios: (see table 44)

Geographical distribution: (Map 16) Only known from the type locality. One specimen from Mexico, Rinton, Antonio, Oaxaca, Feb. 1908, F. Hamilton, included by Allen (1969) in L. dilaticollis, was not available for study; its location however is geographically closer to that of L. faveolatus than to the known distribution range of L. dilaticollis; it seems to me that this Mexican specimen may be conspecific with L. faveolatus.

Material examined

Type material: Holotype ♂ of Leptoglossus faveolatus, from Panama, labelled "Panama, AMNH, Leptoglossus dilaticollis Guer. det. R.C. Allen 1968" is preserved in AMNH collection. Paratype ♂, of no precise location, labelled "S. America" is preserved in BMNH collection.

Plate 44

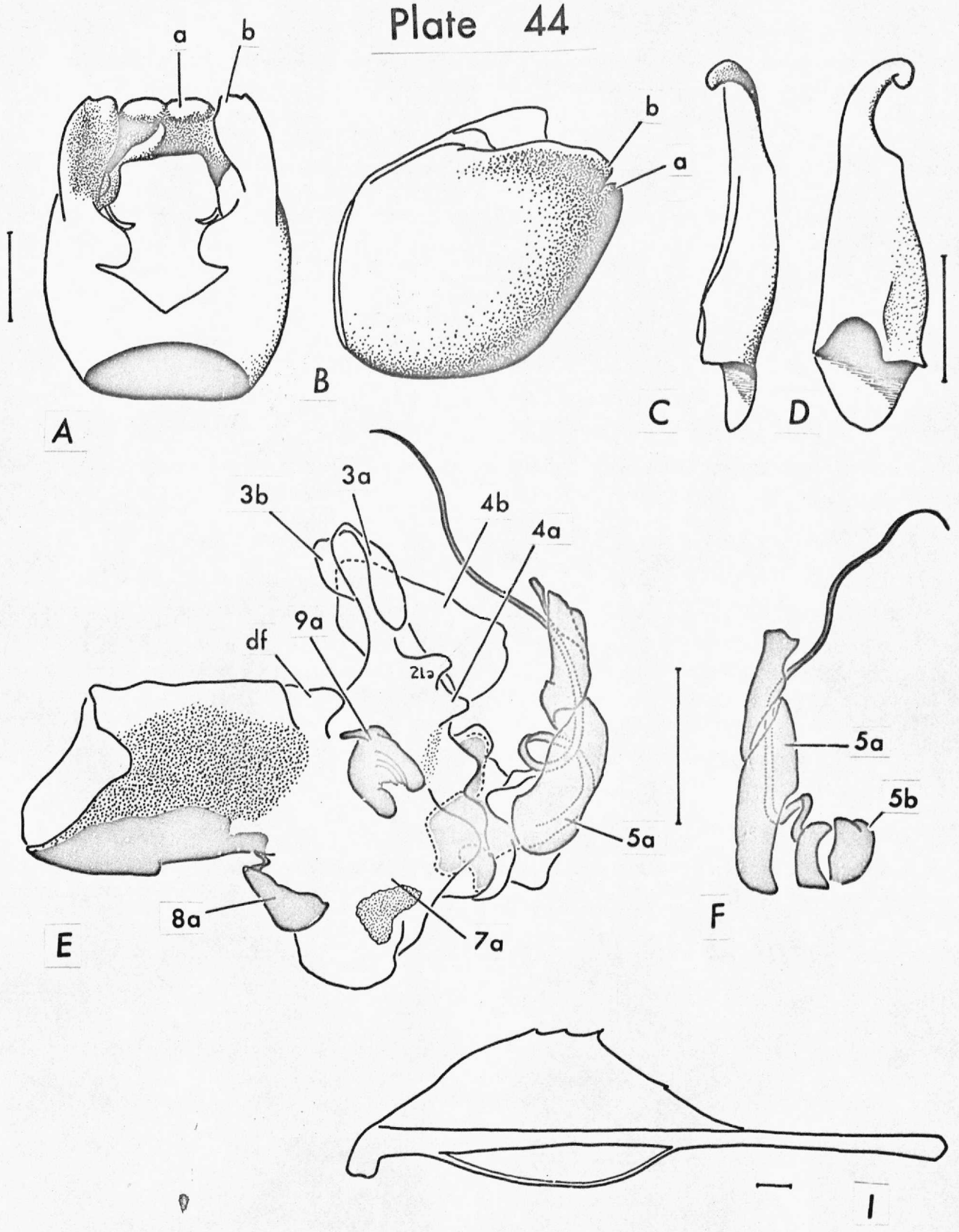


Table 44 Measurements (2 ♂♂ from 1 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	2	33.5-33.6	33.5	-	—	-
2 Head length	2	5.13-5.42	5.27	-	—	—
3 " width	2	3.21-3.26	3.23	-	—	—
Distance:						
4 inter-ocular	2	1.68-1.77	1.72	-	—	—
5 ante-ocular	2	2.73-2.83	2.78	-	—	—
Antennae:						
6 segm. I length	1	4.08	4.08	-	—	—
7 " II "	1	7.20	7.20	-	—	—
8 " III "	1	5.52	5.52	-	—	—
9 " IV "	1	8.25	8.25	-	—	—
Labium:						
10 segm. I length	1	5.32	5.32	-	—	—
11 " II "	1	5.76	5.76	-	—	—
12 " III "	2	4.08-5.04	4.56	-	—	—
13 " IV "	2	8.78-9.93	9.35	-	—	—
14 Pronotum length	2	6.24-6.72	6.48	-	—	—
15 " width	2	17.2-17.5	17.3	-	—	—
16 Scutellum length	2	3.50-3.55	3.52	-	—	—
17 " width	2	3.79-3.93	3.86	-	—	—
18 Hind tibia length	2	15.8-17.3	16.5	-	—	—
Tibial dilation:						
19 total width	2	4.51-4.75	4.63	-	—	—
external part:						
20 length	2	9.12-10.2	9.66	-	—	—
21 width	2	2.88	2.88	-	—	—
internal part:						
22 length	2	7.20	7.20	-	—	—
23 width	2	1.10-1.20	1.15	-	—	—
24 Undilated portion	2	5.42-5,95	5.68	-	—	—
Ratios: (figures refer to characters numbers above).						
1 / 2	2	6.18-6.54:1	6.35:1	-	—	—
1 / 18	2	1.93-2.12:1	2.03:1	-	—	—
2 / 3	2	1.57-1.68:1	1.63:1	-	—	—
6 / 2	1	0.79:1	0.79:1	-	—	—
10 / 2	1	1.03:1	1.03:1	-	—	—
9 / 6	1	2.02:1	2.02:1	-	—	—
15 / 16	2	4.91-4.92:1	4.91:1	-	—	—
20 / 18 %	2	57.7-58.9	58.5	-	—	—
22 / 18 %	2	41.6-45.5	43.6	-	—	—

Leptoglossus distanti sp.n

(Plate 45)

[Leptoglossus dilaticollis Guerin; Distant, 1881: 124. Misidentification].

General and differential diagnosis: Head with a median longitudinal narrow light brown band; external and posterior surfaces of distal half of femur, black; pronotum almost vertical, densely punctated; humeral area expanded into moderately broad and long lateral processes; margins of the latter armed with large acute teeth; lateral margins of pronotum armed with prominent rounded tubercles; length of undilated part of hind tibia = 1.10mm. Characteristic features of ♂♂: shape of Ist gonocoxa and shape and size of spermatheca.

L. distanti resembles L. faveolatus and L. dilaticollis, but can be distinguished from both by: brown longitudinal median band on head, pronotum not faveolate, and tibial dilation extending over 83% (about 4/5th) of tibial length. For relationship with these species see L. dilaticollis.

Description: (based on a single female specimen). Head. Dorsal surface, lateral surface of juga and gula black; lateral surface, tylus, two dorsal short stripes behind ocelli and a median longitudinal narrow band light brown. All labial segments yellow ochre to tan, with a dark

brown to black band on the anterior median surface, spex of IVth segment black. All antennal segments tan. Tylus blunt; forming a prominent and elevated ridge anterior to and between the juga, the latter slender, tapering anteriorly, with straight median margin. Labium not reaching beyond the IIIrd sternite. Thorax. Pronotum, scutellum and corium dark reddish brown; with teeth and tubercles on margins of pronotum black; corium with wide, straight, transverse dull yellow patch. Lateral and ventral surfaces light brown, with scattered small black spots; pro and mesosternum black. Fore and middle legs dark yellow ochre to light brown, coxa of both legs without colour patches; spines on femur of both legs black. Hind legs light reddish brown; femur darker distally with the dorsal half of the external and posterior surfaces dark brown to black; spines entirely or at least apically black; posterior surface of tibial dilation brown with margins and main shaft slightly paler; anterior surface of tibial dilation light brown tinged with black; undilated portion of tibia light brown. Pronotal calli not elevated; anterior part of pronotum almost vertical; pronotum densely punctated; lateral and humeral areas expanded into broad, comparatively short, slightly elevated and anteriorly projecting lateral processes; margins of the latter armed with large acute teeth; lateral margins of pronotum armed with prominent rounded tubercles; posterior margin straight. Hind tibia (fig. I) with long lanceolate tibial dilation, extending over 83% (4/5th) of the length of tibia. Abdomen. Tergites black, with a median longitudinal band yellow ochre to yellowish white, becoming narrow anteriorly; connexivum brown to dark brown. Sternites, Ist gonocoxa and laterotergite light brown, with scattered

black spots.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in Fig. G; spermatheca (fig. H) with dilated portion of the duct elongate, and narrow base.

Measurements (1 ♀) in millimetres: Body length = 29.0; Head length = 3.66; Head width = 2.71; Distances: inter-ocular = 1.44, ante-ocular = 1.99; Antennal segments: I = 3.16, II = 4.60, III = 2.88, IV = 5.76; Labial segments: I = 3.42, II = 3.42, III = 1.74, IV = 3.51; Pronotum: length = 1.76, width = 4.37; Scutellum: length = 7.05, width = 7.68; Hind tibia length = 10.4; Tibial dilation width = 3.21; External tibial dilation: length = 8.64, width = 1.72; Internal tibial dilation: length = 5.76, width = 1.00; undilated part = 1.10.

Ratios: Body length/head length = 7.92:1; Body length/tibia length = 2.78:1; Head length/ head width = 1.35:1; Ist Antennal segment/head length = 0.86:1; Ist Labial segment/head length = 0.93:1; IVth Antennal segment/Ist Antennal segment = 1.82:1; Pronotum width/scutellum length = 0.61:1; External tibial dilation length/tibia length = 83.1%; Internal tibial dilation length/tibia length = 55.3%.

Geographical distribution: (Map 16) Only known from type locality.

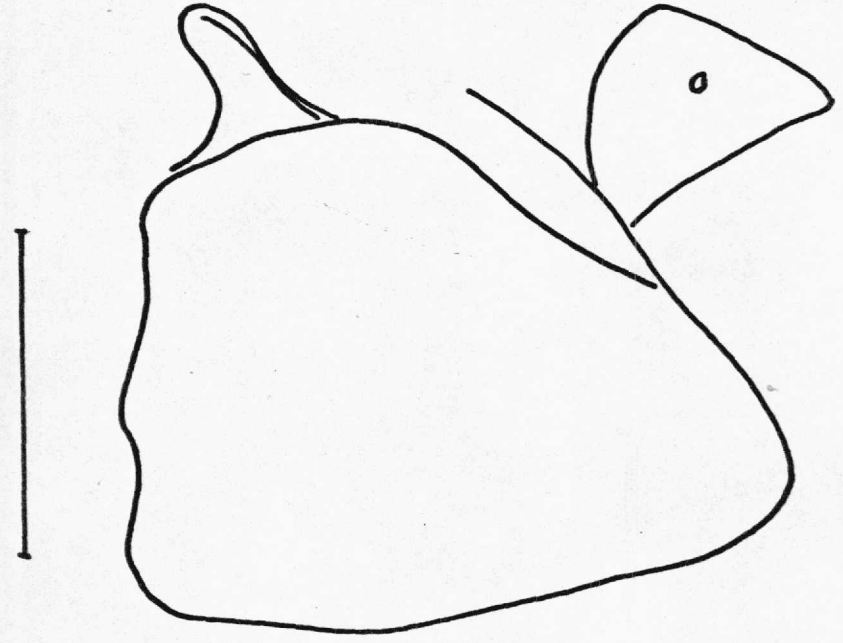
Habitat and Biology: During the dissection of the available specimen well developed eggs were found which are subcylindrical with one side

flat, length 1.90mm, width 1.40mm, height 1.14mm.

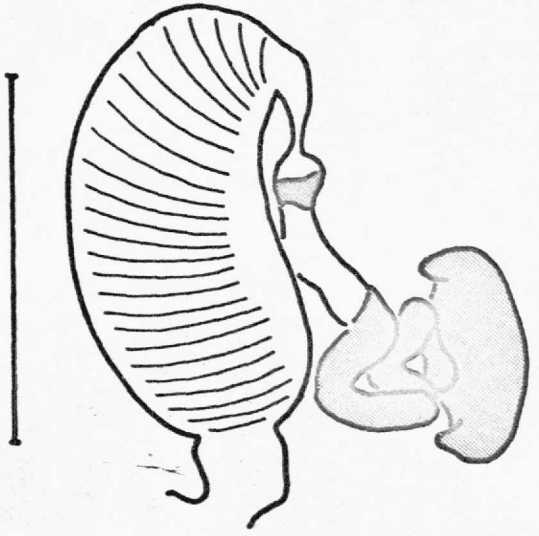
Material examined

a) Type material: Holotype ♀ of Leptoglossus distanti , from Guatemala, Vera Paz, labelled "Senahu, Vera Paz, Champion, B.C.A., Hem. I Leptoglossus dilaticollis", in BMNH collection. The species is named in honour of W.L. Distant.

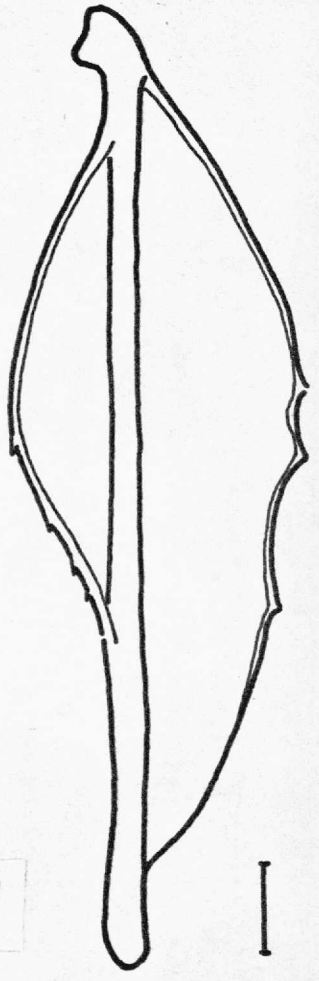
Plate 45



G



H



I

Leptoglossus fulvicornis (Westwood), 1842

(Plate 46)

Anisoscelis fulvicornis Westwood, 1842: 17. Holotype ♀ U.S.A. (UM) [examined]

Leptoglossus fulvicornis (Westwood): Stål, 1870: 161; Distant, 1901a: 330, pl. 30, fig. 4; Van Duzee, 1917: 89; Gibson, 1917: 70; Parshley, 1923: 747; Blatchley, 1926: 221; Torre-Bueno, 1941: 49; Allen, 1969: 78.

Leptoglossus magnoliae Heidemann, 1910: 191-5, pl. 7, [synonymized by Van Duzze, 1917: 89].

Theognis fulvicornis (Westwood): Hussey, 1953: 30.

General and differential diagnosis: Pronotum coarsely punctate almost rugulose; humeral areas laterally expanded into short rounded processes; lateral margins and postero lateral margins of pronotum somewhat serrate and armed with small stout teeth; length of undilated part of hind tibia = 2.49 - 2.97 (2.64)mm. Characteristic features of ♂♂: shape and size of genital capsule and paramere, and the shape and size of dorsal sac and the processes 3a-b, 4a-b, 9a-b and 5a. Those of ♀♀: shape of Ist gonocoxa and shape and size of spermatheca.

L. fulvicornis shares with L. rubrescens: the absence of a transverse yellowish patch on corium, the expansion on main shaft of paramere,

and the conditions (presence or absence) of black patches on dorsal surfaces of head; these similarities appear to be secondary rather than an indication of close relationship; because the other characters such as: shape and condition of humeral areas of pronotum and of the tibial dilation, shape of genital capsule, phallus and spermatheca, show considerable differences and those of L. rubrescens are unique and characteristic of this species.

Description: General characters, see Blatchley, 1926: 221; Allen, 1969: 78.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly below the level of lateral margins, and a deep notch; with a distinct median projection (a); dorsal prongs (b) projected and directed medially; lateral margins ascending and widening posteriorly, with acute posterior projections. Paramere (fig. C,D) - main shaft expanded dorso laterally (c) then narrowing to form a shank which ends in a curved hook; shank without median lobe. Phallus (fig. E) - phallotheca slightly sclerotized laterally; conjunctiva with a moderately long, apically swollen dorsal sac, and armed with the following processes: 3a-b membranous and very conspicuous, 3b larger and wider than 3a; 4a-b membranous, small, 4b slightly bigger than 4a; 9a-b heavily sclerotized at margins and tip, the latter flat and truncate; 8a-b heavily sclerotized, subhorizontal each with two anterior projections, the internal one flat and acute and the external flat and blunt; 7a-b membranous and wide; 5a (fig. E,F) short with only two complete convolutions, the second one rather shorter than the first one.

Female genitalia: First gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with dilated portion of the duct, comparatively long and narrow base.

Measurements and Ratios: (see table 45)

Geographical distribution: (Map 16) Most of the known material has been recorded from U.S.A.: Massachusetts, New York, New Jersey, Pennsylvania, Washington D.C., Virginia, North Carolina, Alabama and Florida, but two specimens in NM are labelled as collected in South America, the country of origin of one of them being Brasil. The isolated location of these two specimens does not necessarily mean that the distribution of the species is discontinuous, but probably is due to insufficient knowledge of distribution range from the intervening area. As reported by Blatchley (1926) even in U.S.A., L. fulvicornis is uncommon, the same scarcity is observed in the other species of the genus, and this is reflected in the number of the existing records and specimens collected: dilaticollis 13 specimens, faveolatus 2 specimens, distanti 1 specimen, rubrescens 5 specimens. Brasil should therefore be considered at present as a valid record, representing perhaps the southernmost limit of the distribution range of L. fulvicornis. In the tribe Anisoscelini there are some species in other genera, with very wide distribution range, for instance F. gonagra extends from Virginia (U.S.A.) to the northern part of Argentina, and V. zonata from California (U.S.A.) to the northern part of Argentina.

Discussion: The most important variations observed in the material were as follows: 7 specimens showed dark brown to black patches on dorsal surface of the head, distribution as follows: medial to and behind antenniferous tubercles, behind the eye, and behind the ocelli, IVth antennal segment might occasionally be dark brown.

Material examined

a) Type material: Holotype ♀ of Anisoscelis fulvicornis Westwood, from U.S.A. labelled "Type Hem. 331, Anisoscelis fulvicornis Westwood" in UM collection.

b) Other material: BRASIL: 1 ♀ (NM), labelled "S, Amer." 1 ♀ (NM). U.S.A.: Virginia, Shenandoah Natl. Pk., 460m, 7 - XII - 1945, J. Stehlik, on weeds, 1 ♀ (BMNH); N. Carolina, Southern Pines, IX - 1909, A.H. Manee, 1 ♂ (AM); Washington, D.C., 20 - IX - 1901, Heideman, Distant Coll., 1 ♂ (BMNH); New Jersey, 22 - IX - 1937, E.P. Darlington, Ex. Coll. H. Ruckes, 1 ♂ (AM); Florida, - III - 1960, B.W. Nelson, 1 ♀ (RNH); Florida, Winter Pk., 10 - II - 1946, 1 ♀ (AM); Baltimore, 8 - XI - 1941, 1 ♀ (ZSBS); 3 ♀ (ZSBS); 1 ♂, 1 ♀ (IZA).

Plate 46

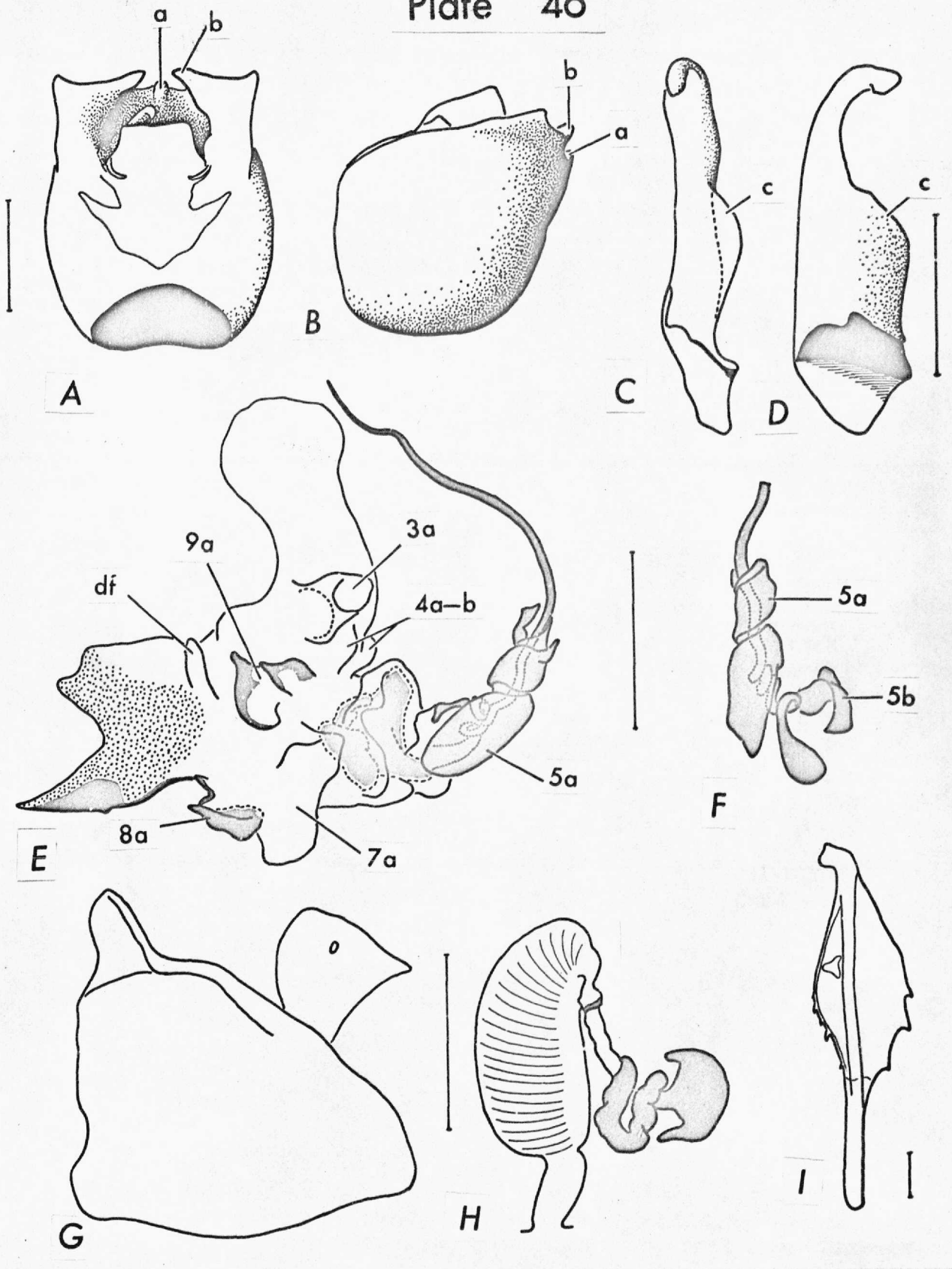


Table 45 Measurements (4 ♂♂ and 5 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	18.6–20.0	19.0	5	21.8–24.0	22.7
2 Head length	4	2.85–3.11	2.98	5	3.42–4.00	3.65
3 " width	4	2.24–2.33	2.29	5	2.49–2.71	2.57
Distance:						
4 inter-ocular	4	1.25–1.27	1.26	5	1.38–1.52	1.43
5 ante-ocular	4	1.57–1.67	1.60	5	1.84–2.16	1.97
Antennae:						
6 segm. I length	4	2.06–2.24	2.13	5	2.37–2.77	2.54
7 " II "	4	3.40–3.60	3.46	5	3.93–4.80	4.35
8 " III "	3	2.16–2.59	2.35	5	2.68–3.12	2.83
9 " IV "	3	3.60–3.69	3.63	4	4.12–4.51	4.35
Labium:						
10 segm. I length	4	2.75–2.88	2.83	5	3.04–3.80	3.37
11 " II "	4	2.66–2.85	2.79	5	2.88–4.08	3.47
12 " III "	4	1.50–1.80	1.60	5	1.63–2.37	1.94
13 " IV "	4	3.26–3.76	3.46	5	2.51–5.90	3.92
14 Pronotum length	4	3.07–3.98	3.61	5	3.98–4.46	4.23
15 " width	4	6.14–7.15	6.56	5	7.82–8.88	8.18
16 Scutellum length	4	2.14–2.47	2.25	5	2.83–2.96	2.88
17 " width	4	2.31–2.58	2.39	5	2.85–3.23	3.02
18 Hind tibia length	4	7.20–7.92	7.46	5	8.11–8.88	8.60
Tibial dilation:						
19 total width	4	1.53–1.87	1.66	5	2.30–2.54	2.40
external part:						
20 length	4	4.32–4.60	4.43	5	4.89–5.76	5.25
21 width	4	0.76–0.96	0.82	5	1.10–1.25	1.18
internal part:						
22 length	4	3.21–3.60	3.37	5	3.84–3.98	3.88
23 width	4	0.48–0.62	0.51	5	0.62–0.84	0.75
24 Undilated portion	4	2.20–2.54	2.38	5	2.49–2.97	2.64
Ratios: (figures refer to character numbers above).						
1 / 2	4	6.01–6.80:1	6.37:1	5	5.87–6.43:1	6.21:1
1 / 18	4	2.34–2.77:1	2.54:1	5	2.56–2.71:1	2.63:1
2 / 3	4	1.25–1.35:1	1.30:1	5	1.34–1.50:1	1.42:1
6 / 2	4	0.67–0.76:1	0.71:1	5	0.68–0.72:1	0.69:1
10 / 2	4	0.92–1.00:1	0.94:1	5	0.87–1.00:1	0.92:1
9 / 6	3	1.60–1.79:1	1.69:1	4	1.72–1.77:1	1.74:1
15 / 16	4	2.81–3.00:1	2.91:1	5	2.64–3.08:1	2.84:1
20 / 18 %	4	58.0–60.0	59.3	5	55.6–64.8	61.0
22 / 18 %	4	44.5–45.8	45.1	5	43.2–47.3	45.1

Leptoglossus rubrescens (Walker), 1871

(Plate 47)

Malvana rubrescens Walker, 1871: 134.2 Holotype ♂, Brasil (BMNH) [examined]

Malvana rubrescens Walker: Lethierry & Severin, 1894: 51

Leptoglossus rubrescens (Walker): Distant, 1901b: 417; Allen, 1969: 76

General and differential diagnosis: Pronotum with dense and deep uniform punctation; humeral areas expanded into long, tapering, lateral processes; distal half of lateral margins of pronotum with small stout teeth; postero lateral margins armed with more prominent and acute teeth; length of undilated part of hind tibia = 1.48 - 1.92 (1.64)mm. Characteristic features of ♂♂: shape and size of genital capsule and parameres, and the shape and size of the dorsal sac and of the processes 3a-b, 9a-b and 5a. Those of ♀♀: the shape of Ist gonocoxa and shape and size of the spermatheca.

L. rubrescens shows closer affinity with L. fulvicornis than with any other species of the genus, although it is in some respects a unique species. (See discussion in L. fulvicornis).

Description: General characters, see Allen, 1969: 76-8.

Male genitalia: Genital capsule (fig. A,B) - posterior margin about

level with lateral margins, with a deep rounded median notch and no dorsal prongs; lateral margins somewhat horizontal and sinuate. Paramere (fig. C,D) - main shaft with dorsal expansion (a) somewhat projecting distally; shank slender, without median lobe, terminating in a medially curved and comparatively thick hook. Phallus (fig. E) - conjunctiva with a short dorsal sac, distally with two lobes, the shorter anterior, and the posterior wider and longer, occasionally elongate and tapering apically; conjunctiva armed with the following processes: 3a-b membranous and conspicuous, both of equal size and shape; 9a-b heavily sclerotized, apparently subdivided, terminating in a large and truncate tip; 8a-b heavily sclerotized, each with two acute anterior projections, 7a-b membranous, wide; 5a (fig. E,F) short with only two complete convolutions, the second one rather shorter than the first one. Processes 4a-b absent.

Female genitalia: First gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig, H) small.

Measurements and Ratios: (see table 46)

Geogrphical distribution: (Map 16) Only known from Brasil and Venezuela.

Habitat and Biology: In Brasil collected in Gallery Forest and in Venezuela in Tropical Moise Forest at 230m of altitude. The two specimens from Brasil were found with an egg each of a Tachinid (Diptera), possibly Trichopoda pennipes Fabr., deposited on dorsal surface of the head.

Discussion: The colour pattern within the species appears to vary considerably. None of the specimens studied have the dark reddish brown colouration of the type, the two males from Venezuela are dark greenish brown, the male from Brasil is almost black and the female from the same locality is the one which resembles more the colouration of the type but is slightly darker; the colouration of the veins is reddish brown in the four specimens but not so red as in the type; the male from Brasil has the juga and tylus black and dorsal surface of head behind the eye with black tinge; this male, the female from the same locality and a male from Venezuela has the area behind and around each ocelli dark brown to black.

Material examined

a) Type material: Holotype ♂ of Malvana rubrescens Walker, from Brasil, Amazonas, in BMNH collection, labelled "Type, Braz. 62/75, 2 Malvana rubrescens".

b) Other material: BRASIL: Mato Grosso, 12°49'S, 51° 45'W Gallery Forest, 18 - XII - 1968, W.J. Knight, 1 ♂, 1 ♀ (BMNH). VENEZUELA: Barinas, Reserva Forestal Ticopóro, 230m, 3 - 10 - IV - 1966, F. Fernández Yépez, L.J. Joly, on light, 2 ♂ (IZA).

Plate 47

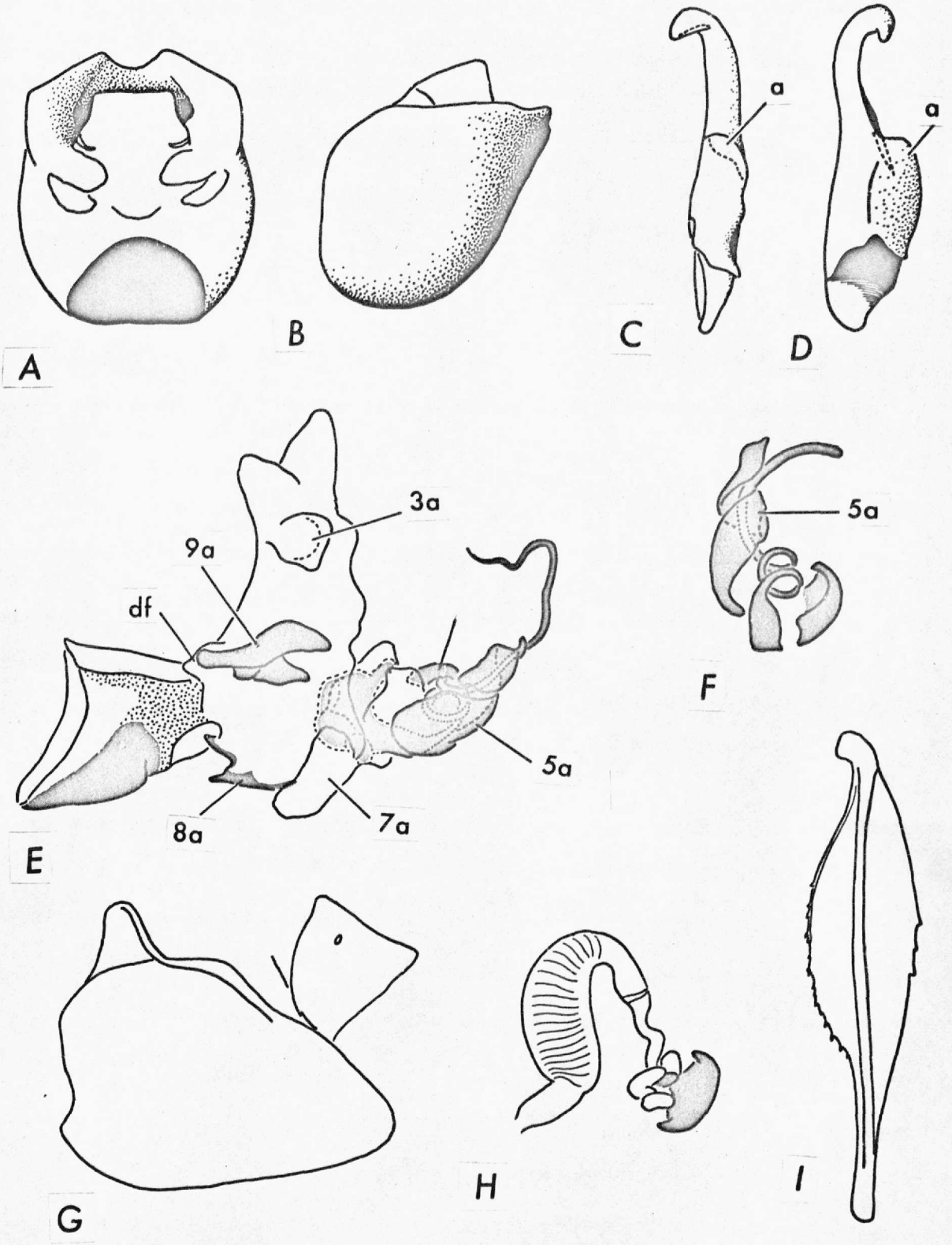


Table 4.6 Measurements (4 ♂♂ and 1 ♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	17.0–20.4	18.9	1	19.5	19.5
2 Head length	4	2.94–3.42	3.21	1	3.26	3.26
3 " width	4	2.18–2.43	2.30	1	2.29	2.29
Distance:						
4 inter-ocular	4	1.14–1.33	1.21	1	1.29	1.29
5 ante-ocular	4	1.44–1.67	1.56	1	1.61	1.61
Antennae:						
6 segm. I length	4	2.37–2.85	2.65	1	2.69	2.69
7 " II "	4	4.51–5.28	4.88	1	4.94	4.94
8 " III "	4	3.36–3.88	3.62	1	3.79	3.79
9 " IV "	4	5.28–6.05	5.61	1	5.66	5.66
Labium:						
10 segm. I length	4	3.00–3.66	3.39	1	3.43	3.43
11 " II "	4	2.88–3.70	3.35	1	3.45	3.45
12 " III "	4	1.90–2.43	2.18	1	2.12	2.12
13 " IV "	4	3.89–6.14	5.28	1	5.47	5.47
14 Pronotum length	4	2.88–3.79	3.44	1	3.60	3.60
15 " width	4	7.29–8.73	7.96	1	7.63	7.63
16 Scutellum length	4	2.07–2.43	2.24	1	2.26	2.26
17 " width	4	1.90–2.43	2.24	1	2.24	2.24
18 Hind tibia length	3	8.64–10.2	9.64	1	9.84	9.84
Tibial dilation:						
19 total width	3	1.96–2.30	2.15	1	2.35	2.35
external part:						
20 length	3	6.19–8.25	7.37	1	7.15	7.15
21 width	3	0.68–0.84	0.78	1	0.80	0.80
internal part:						
22 length	3	4.94–6.43	5.87	1	5.52	5.52
23 width	3	0.84–1.20	1.03	1	1.10	1.10
24 Undilated portion	3	1.48–1.92	1.64	1	1.92	1.92
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.46–6.97:1	5.88:1	1	5.98:1	5.98:1
1 / 18	3	1.96–2.01:1	1.96:1	1	1.98:1	1.98:1
2 / 3	4	1.30–1.45:1	1.39:1	1	1.42:1	1.42:1
6 / 2	4	0.76–0.92:1	0.82:1	1	0.82:1	0.82:1
10 / 2	4	1.02–1.08:1	1.05:1	1	1.05:1	1.05:1
9 / 6	4	1.94–2.25:1	2.11:1	1	2.10:1	2.10:1
15 / 16	4	3.35–3.89:1	3.55:1	1	3.37:1	3.37:1
20 / 18 %	3	71.6–80.8	76.4	1	72.6	72.6
22 / 18 %	3	57.0–63.0	60.8	1	56.0	56.0

VENEZA gen.n

(Plates 48-71)

Type-species: Veneza zonata Dallas

Diagnosis: Small to large species. Head. dorsal surface black with three light tan to light reddish brown longitudinal stripes; antennal segments of various colours. Non declivent and porrect, slightly depressed behind ocelli; tylus and juga above the level of antenniferous tubercles; ratio length of head to inter-ocular distance = 1.90 - 2.78:1 (2.69:1); Ist antennal segment either shorter or longer than head; labium of different length from short reaching only the middle of the metasternum, to long, extending up to the middle of Vth sternite. Thorax. Colour of pronotum, scutellum and corium variable, the most usual condition is dark reddish brown with various markings on pronotum and corium; corium usually with transverse yellowish patch; pleural region usually with numerous small black spots. Pronotum moderately to steeply declivent; calli with sculpture different from that of the disk; lateral margins usually entire and sinuate, occasionally straight; pronotal disk without median longitudinal carina; humeral areas usually level with dorsal part of the disk; postero lateral margins usually serrate; surface of pronotum with dense fine punctation. Scutellum usually wider than long. Hind tibia (fig. I)

usually with foliaceous tibial dilation, but of different lengths, width and number and size of emarginations; very occasionally lanceolate. Corium usually with fine dense punctations. Abdomen. Tergites and connexivum usually black, or dark reddish brown, occasionally with intersegmental sutures or the whole medial area of tergites yellow ochre to yellow; sternites usually with numerous small black spots (occasionally without spots).

Male genitalia: Genital capsule (fig. A,B) - without subproctigeral sac, posterior margin with median notch, variable in shape and size, dorsal prongs variable in shape, very occasionally absent; lateral margins usually flared. Paramere (fig. C,D) - shaft usually with well developed thick outer lobe and wide distal cavity; shank usually thick, with or without median lobe; hook of various shape and degree of curvature, with medial subapical projection. Phallus (fig. E) - phallotheca usually slightly sclerotized laterally; conjunctiva usually with long dorsal sac, the apex of the latter usually twisted to the left and sometimes with asymmetrical apex; conjunctiva armed with the following processes: 1 and 2a-b variable in shape, usually heavily sclerotized; 3a-b membranous, variable in shape and size, sometimes with their tips weakly sclerotized; 4a-b usually heavily sclerotized; 9a-b sclerotized, variable in shape and size; 8a-b heavily sclerotized each with two anterior projections, the external flat usually acute, and the internal smaller and usually blunt or rounded; 6 and 7a-b membranous; 5a (fig. E,F) usually narrow and elongate.

Female genitalia: Spermatheca (fig. H) with duct dilation usually kidney shaped, the tubular portion of the duct usually long.

Geographical distribution: (Maps 17 - 25) The majority of the species occur in the Neotropical region, from the southern part of Mexico and the Antilles, up to the middle part of Chile and Argentina; some species occur in the Neartic region, reaching as far north as British Columbia and Alberta.

Discussion: The majority of the species here assigned to this genus were included in the genus Leptoglossus sens. lat.; Allen (1969) placed them in several groups within the division B of his classification of Leptoglossus sens. lat. The new genus Veneza as here conceived differs from the other genera of the Leptoglossus group of genera by: presence of processes 1, 2a-b and 4a-b and by the shape of spermatheca.

KEY TO SPECIES
(incorporating parts of Allen's Key)

1 Corium usually with yellowish markings; if markings absent the insects are robust with humeral areas produced into long tapering processes; genital capsule usually with (sometimes without) dorsal prongs; labium usually reaching beyond the IIIrd sternite..... 2

\- Corium without yellowish markings; genital capsule usually without dorsal prongs; labium usually very short not reaching beyond the anterior half of IIIrd sternite..... 32

2 (1) Corium with transverse yellowish white patch; usually with yellow ochre markings on pronotum 3

\- Corium with different yellowish white markings than above; without yellow ochre markings on pronotum..... 21

3 (2) Transverse patch on corium straight; dorsal sac long uniformly wide; process 1 large, its tip well elevated and diverging from conjunctival membrane; processes 4a-b small, lobuliform and well separated; 9a-b with base membranous with only the margin moderately sclerotized..... 4

\- Transverse patch on corium irregular; dorsal sac usually bulging distally; the combination of conditions of processes 1, 4a-b and 9a-b not as above..... 5

4 (3) "Humeral angles acuminate, acute and obliquely ascending; pronotal disk with contrasting yellow areas in the form of distinctly separated ovoid spots or larger more quadrate spot partially fusing medially, posterior marginal area of pronotum yellow; hind wing unicolorous (West Indies)". (Allen, 1969); tibial dilation comparatively small, occupying about 61.3%, $\frac{5}{8}$ of the length of tibia; genital capsule, paramere and hind tibia, see plate 51..... balteata(p.448)

\- "Humeral angles more rounded, subacute; pronotum concolorous; disk rarely with yellowish areas (if yellow areas are present they are poorly defined, more diffused and dull), posterior marginal area of pronotum never yellow; hind wings with basal

half dark, distal half clear (North and Central America)" (Allen, 1969); tibial dilation longer, occupying about 71.5%, $\frac{3}{4}$ of the length of tibia; genital capsule, paramere and hind tibia, see plate 52. ..... phyllopa(p.455)

5 (3) "Hind tibial dilation lanceolate, without deep emarginations along outer margins " (Allen 1969) (Plates 63, 66 and 67, fig. I)... 6

\- "Hind tibial dilation conspicuously phylliform with at least one (Usually more) deep emarginations" (Allen 1969) (Plates 53-63, 65, 66, 70 and 71, Fig. I) 9

6 (5) "Tylus extending beyond juga as a porrect spine which is as long as, or longer than, length of an eye; broad irregular transverse fascia on corium" (Allen, 1969); genital capsule, paramere, phallus, spermatheca and hind tibia as in plate 69..... ..... clypealys (p.553)

\- "Tylus rounded or pointed apically, but never spinosely produced; transverse fascia on corium narrow, confined to veins or absent" (Allen 1969)..... 7

7 (6) "Labium short, reaching at most to the middle of third abdominal sternum, third labial segment never extending beyond anterior margin of metasternum; pronotal lateral margins straight, humeral angles acute (Brasil)" (Allen 1969); genital capsule,

paramere, phallus, spermatheca and hind tibia as illustrated in plate 64..... lonchoides (p.531)

- "Labium long, reaching well onto abdomen, at least to the anterior margin of fourth abdominal sternum, third labial segment extending to at least posterior margin of metasternum; pronotal lateral margins sinuate, humeral angles broadly rounded (North America)" (Allen, 1969)..... 8

8 (7) "Inner and outer tibial dilations of nearly equal length, dilations shorter, occupying less than 70% length of hind tibia" (Allen, 1969); spermatheca and hind tibia as illustrated in plate 68, figs. H and I..... occidentalis (p.548)

- Inner and outer tibial dilations not of equal length, outer dilations conspicuously longer than inner and occupying 85% or more length of hind tibia" (Allen, 1969); spermatheca and hind tibia as illustrated in plate 67, figs. H and I. .... corcula (p.544)

9 (4) Hook of paramere thick, short and blunt; not strongly curved, process 1 of conjunctiva extending close to the apex of dorsal sac; processes 9a-b with long, narrow and pointed anterior projection; process 5a rather thick; spermatheca with very large duct dilation, tubular portion of the duct very short and wide. 10

- Hook of paramere and processes 9a-b with combination of characters

different from above; process 1 of conjunctiva well separated from apex of dorsal sac; process 5a narrower (plates 56-63 and 71); spermatheca with large duct dilation, tubular portion of the duct long to moderately long..... 12

10 (9) Pronotum with dull red central area and black margins; tibial dilation with two emarginations; genital capsule with very wide deep and rounded median notch, dorsal prongs small almost obsolete; paramere, process 5a of phallus and spermatheca as shown in plate 55,..... balloui (p.475)

- Pronotum with colour pattern different from above; external tibial dilation with three or four emarginations; median notch and dorsal prongs of genital capsule, parameres, process 5a and spermatheca different from above..... 11

11 (10) "Dorsum light reddish brown; anterior portion of pronotal disk with a yellowish rectangular transverse band not reaching lateral margins (Allen, 1969); genital capsule, paramere, Ist gonocoxa and hind tibia as illustrated in plate 54.....
..... macrophylla (p.472)

- "Dorsum piceous to dark reddish brown; pronotal disk unicolorous or the entire anterior half of pronotum before hûmeri yellow" (Allen, 1969); genital capsule, paramere, Ist gonocoxa and hind tibia as illustrated in plate 53. .....
..... ingens (p.465)

12 (9) Pronotum usually with well defined rounded to ovoid yellowish white markings..... 13

\- Pronotum without yellowish white markings 18

13 (12) Process 3a of phallus with additional proximal lobe (d) (plates 56, 57 and 58); paramere with long very conspicuous outer lobe 14

Process 3a simple without additional lobe; paramere with low or moderately so outer lobe. 16

14 (13) Genital capsule with deep quadrate to subtrapezoidal median notch; dorsal prongs very acute and slightly deflected medially; hook of paramere not straight; process 1 of conjunctiva small and stout; dorsal sac of conjunctiva as illustrated in plate 58, fig. E. ..... zonata (p.492)

\- Median notch of genital capsule not as above; dorsal prongs not deflected medially and wider; hook of paramere straight; process 1 of conjunctiva long and appressed. 15

15 (14) "Second antennal segment entirely fuscous; pronotum with two large diffuse yellowish-orange areas occupying most of disk and anterior half of humeral area; pronotum behind humeri dark, without contrasting pale area" (Allen, 1969); median notch of genital capsule wide rounded to subquadrangular; distal portion of dorsal sac long, narrowing distally; genital capsule, paramere, phallus and Ist gonocoxa as illustrated in plate 56 ..... conspersa (p.481)

- Second antennal segment bicoloured with medial portion paler and the remaining areas dark; pronotal disk with two distinct round pale spots; posterior narrow marginal area of pronotum yellowish strongly contrasting with adjacent darker areas; lateral margins of pronotum nearly straight; median notch of genital capsule rather narrow, "U" to "V" shaped; distal portion of dorsal sac rounded and slightly bulging; genital capsule, paramere, phallus and Ist gonocoxa as illustrated in plate 57. ..... aucta (p.487)

16 (13) Anterior portion of pronotum without yellowish white markings; posterior portion and the area between humeral angles with a wide rectangular yellowish white patch. .... concolor (p.516)

- Anterior portion of pronotum with yellowish markings; posterior portion without markings 17

17 (16) Lateral margins of pronotum not serrate; genital capsule with deep and wide rounded to subquadrate median notch; process 2b obsolete; genital capsule, paramere, Ist gonocoxa, spermatheca and hind tibia as illustrated in plate 60..... .....neovexillata (p.506)

- Posterior half of lateral margins of pronotum serrate; genital capsule with deep rather narrow median notch; process 2b well developed, spinose, of the same size as process 2a; genital capsule, Ist gonocoxa, spermatheca and hind tibia as illustrated

in plate 61. ..... impictipennis (p.511)

18 (12) "Dorsum piceous; all marginal areas of pronotum continuously and widely yellowish-orange; venter largely bright orange with few small piceous maculae" (Allen, 1969); genital capsule and paramere as illustrated in plate 71. .....

..... ashmeadi (p.561)

- With combination of characters different from above..... 19

19 (13) Labium short not extending beyond metasternum; IVth labial segment shorter than Ist antennal segment; transverse patch on corium occasionally very feint; (North America, small species). ...

..... brevirostris (p.557)

- With combination of characters different from above..... 20

20 (19) "Pronotal calli with a rough surface texture, numerous dark thick hairs interspersed with pale hairs on anterior pronotal disk; male genital capsule with a rectangular median notch, no dorsal prongs" (Allen, 1969); process 3a bulging; process 5a comparatively short and thick; tubular portion of spermatheca moderately long, rather wide and curved (see plate 62, fig. H).

..... concolor (p.516)

- "Pronotal calli smooth, pale pilose hairs only on anterior pronotal disk; male genital capsule with a rounded median notch, dorsal prongs present" (Allen, 1969); process 3a narrow tapering distally; process 5a longer and narrower; tubular portion of

spermatheca long and uniformly narrow and strongly curved (see plate 63, fig. H). ..... stigma (p.524)

21 (2) "Postero lateral margins of pronotum entire; first antennal segment unicolourus" (Allen, 1969); yellowish white markings on corium reduced to a short oblique mark on medial vein; process 3a of conjunctiva bifid (see plate 59).....
..... opposita (p.502)

\- Postero lateral margins of pronotum dentate or serrate; Ist antennal segment bicoloured with a pale inner marginal area; transverse patch on corium and process 3a not as above.....
..... 22

22 (21) Postero lateral margins of pronotum dentate; posterior margin of pronotum yellowish; yellowish marking on corium present on distal portions of all veins; process 3a of conjunctiva bulging, with an additional proximal lobe (d); genital capsule, paramere and phallus as illustrated in plate 65.....
.....pallidivenosa (p.535)

\- Postero lateral margins of pronotum serrate; posterior margin of pronotum dark brown; without yellowish white markings on corium; process 3a elongate and narrow tapering distally; genital capsule, paramere and phallus as illustrated in plate 66 (robust species with humeral angles produced into long tapering processes) ..... humeralis (p.539)

23 (1) "Entire length of lateral pronotal margins with well developed teeth; a single large rounded piceous macula (about the size of an eye) on mesopleuron; abdominal dorsum mesally dark with lateral areas largely yellow" (Allen, 1969); genital capsule with dorsal prongs; process 5a of conjunctiva rather short, thick and tightly coiled; tubular portion of the spermathecal duct very short and wide; genital capsule, paramere, Ist gonocoxa, spermatheca and hind tibia as illustrated in plate 50. ..... dentata (p.443)

\- "Whole length of lateral pronotal margins entire or only the posterior half serrate; mesopleuron with at most small piceous maculae (about the size of an ocellus); abdominal dorsum without yellowish areas" (Allen, 1969); genital capsule without dorsal prongs; process 5a of conjunctiva narrow with open convolutions; tubular portion of the spermathecal duct rather long and narrow; genital capsule, paramere, Ist gonocoxa and hind tibia not as above..... 24

24 (23) Whole length of pronotal margin entire; tibial dilation long with one shallow and three deep emarginations; shank of paramere thin without median lobe; genital capsule, paramere, process 5a of conjunctiva, Ist gonocoxa, spermatheca and hind tibia as illustrated in plate 49.....quadricollis (p.437)

\- With combination of characters different from above. 25

25 (24) "Wider more robust species, total length less than 2.5 times

width across humeri, dorsal surface of male hind femora with 15-20 prominent tubercles" (Allen, 1969). .....

.... impicta (p.434)

- "Narrower more elongate species, total length greater than 2.5 times width across humeri; dorsal surface of male hind femora with at most 10 prominent tubercles." (Allen, 1969) 26

26 (25) "Fourth antennal segment averaging 1.2 times width of head; hind tibia with outer dilation narrower and shorter occupying 62-71% the length of hind tibia; entire venter usually with numerous small piceous spots." (Allen, 1969). .....

.....chilensis chilensis . (p.424)

- "Fourth antennal segment averaging 1.5 times width of head; hind tibia with outer dilation wider and longer, occupying 71-80% the length of hind tibia; numerous small piceous spots usually confined to abdominal midventer." (Allen, 1969)...

..... chilensis concaviusculus (p.428)

Veneza chilensis (Spinola) 1852 comb.n.

(Plate 48)

Anisoscelis chilensis Spinola, 1852: 174. Chile no indication of the number of specimens on which the description was based .

Anisoscelis chilensis Spinola: Signoret, 1863: 555; Reed, 1900: 46.

Theognis chilensis (Spinola): Mayr, 1866: 108.

Leptoglossus chilensis (Spinola): Stål, 1870: 164; Lethierry & Severin, 1894: 46; Pennington, 1922: 132; Allen, 1969: 85-90.

General and differential diagnosis: This species is closely related to V. quadricollis, V. dentata and particularly to V. impicta, as indicated by sharing: short labium not reaching beyond the anterior margin of IIIrd sternite; postero lateral margins of pronotum serrate to dentate; without transverse patch on corium, genital capsule without dorsal prongs; very similar dorsal sac of conjunctiva. Male and female genitalia very similar to those of V. impicta. For diagnosis see discussion on these species.

Description: General characters see Allen 1969: 85

Male genitalia: Genital capsule (fig. A,B) - posterior margin with rounded to trapezoidal median notch, surface of inflected posterior margin with two small lateral prominences

(a); posterior margin slightly below the lateral margins; without dorsal prongs; lateral margins slightly concave, and very slightly flared. Paramere (fig.C,D) - outer lobe small, tapering, apically rounded; shank with conspicuous median lobe; hook short moderatelly wide, close to median lobe and moderately curved, terminating in a pointed medially curved tip. Phallus (fig.E): phallotheca weakly sclerotized laterally; conjunctiva with moderately long and apically somewhat bulging dorsal sac, with the apex somewhat twisted to the left; conjunctiva armed with the following processes: 1 heavily sclerotized, stout and triangular; 2 a-b small, heavily sclerotized somewhat rounded, with acutely pointed tip; 3 a-b membranous, 3b longer and wider than 3a; 4 a-b moderately sclerotized somewhat rounded; 9 a-b heavily sclerotized with wide base, terminating in a long acute tip; 8 a-b heavily sclerotized, each with two anterior projections, the external flat and acute, and the internal flat wide and moderately sclerotized; 6 and 7 a-b membranous and conspicuous; 5 a (fig.E,F) with two elongate convolutions, tapering apically.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig.H) with kidney shaped duct dilation, tubular portion of the duct moderately long.

Two subspecies are recognised.

Veneza chilensis chilensis (Spinola)

Differential diagnosis: See Allens, 1969: 85

Measurements and Ratios: (see table 47)

Geographical distribution: (Map 17) Chile, and central and north-western part of Argentina.

Note. The description of Leptoglossus argentinus Bergroth 1894 shows that it is the same as chilensis; Pennington (1922) and Allen 1969 have expressed previously the same opinion; the type of L. argentinus unfortunately could not be found in the collection of ZMU and is believed to be lost.

Material examined.

ARGENTINA: Mendoza, Pedregal, 22 - I - 1907, Jensen-Haarup, 2♂, 2♀ (UZM); Prov. Mendoza, s.c., 3♂, 2♀ (UZM); s.l., 19-IX-1908, s.c., 1♀ (UZM); s.l., 2-X-1908, s.c., 1♂ (UZM); Chaco de Coria, Prov.Mendoza, s.c., 3♂, 6♀ (UZM); s.d., 1♂, 2♀, (IZA); Cordilleras de Mendoza, s.c., 1♂, 1♀ (UZM); Mendoza, 1♂ (NR); s.d., 4♂, 4♀ (HNHM); Buenos Aires, E.Kivirikk, 1♀ ZMU); Jensen-Haarup, 1♂, 2♀ (ZMU); San Pablo, -X-1905, Vezenyi, 1♀ (HNHM); Metan (Salta), -1-1906, s.c. 2♂ (HNHM); Los Cocos, 17-VII-1941, anon 4, 1 (ZSBS); Prov. Mendoza, Potrerillos,

Reimoser, 2 ♀ (NM), La Plata, 1 ♀ (NM); La Falda, Cordoba, 975 m, 17-2-1958, 11 ♂, 4 ♀ (ZSBS); H.Grande, Cordoba, 1000 m 7-III-1959, 1 ♀ (ZSBS); s.l., 4-9-XII-1954, 2 ♂ (ZSBS); Cap. de Monte, Cordoba, 970m, 19-II-1958, 1 ♀ (ZSBS); s.l., 1-I-1942, 1 ♀ (ZSBS); Mendoza H.Rolle, 2 ♀ (DEI); s.l., 1 ♂ (DEI); Córdoba H.Stempelmann, 1 ♂, 1 ♀ (DEI); Prov. Salta, 2500 m, J. Steinbach, 2 ♂, 4 ♀ (MNHU); La Falda, Cordoba, 975 m, 17-II-1958, 3 ♂, 2 ♀ (ZSBS); Alto Paraná, 15-17-III-1934, Bemberg, 1 ♀ (BMNH); Prov. Mendoza F.M. Edwards, 2 ♂ (BMNH), Isla Los Cisnes, Parana Delta, -V-XI-1920, H.E. Box, 2 ♀ (BMNH); Villa Ana, Jan., 1926, K.J. Hayward. 1 ♀ (BMNH); Córdoba, Cabana, 8-II-1937, M. Biraben, 1 ♀ (MLP); Córdoba, Cabana, -II-III-1945, M. Biraben, 1 ♂, 2 ♀ (MLP); Salta, Tolombon, 7-III-1939, Biraben-Scott, 1 ♀ (MLP); Cordoba, Cabana, 8-II-1937. M. Biraben, 2 ♀ (MLP); Jujuy. II-V-1938, 2 ♂ (MLP); San Juán, 1 ♂ (MLP); Rio Negro. I-1948, on Potatoes, 2 ♂, 1 ♀ (MLP); Catamarca, El Rodeo, I-1942, 1 ♀ (MLP); Prov. San Juan, I-1940, 1 ♂, 1 ♀ (MLP); Catamarca Los Angeles, X-1948, 1 ♀ (MLP). BRASIL: Lagoa Santa. Reinhardt, 5 ♂, 1 ♀ (UZM). CHILE: 1 ♀ (UZM); 1 ♀ (NR); 2 ♂, 1 ♀ (NR); Concepcion, 1 ♀ (NR); Santiago, -IX-1923, F. Schade, 2 ♂, 1 ♀ (ZMU); F. Sahlb, 1 ♀ (ZMU); concepcion, 1903, P. Herbst, 2 ♂, 1 ♀ (TM); Valparaiso, 1 ♀ (TM); 1 ♂ (TM); 1870 Philipi, 1 ♂, 1 ♀ (NM); Thorney, 1 ♀ (NM); 3 ♂, 1 ♀ (NM); Cortaderal, 4-XII-1899, 1 ♀ (MNHU); Cauquenes, 4-XII-1898, 2 ♂, 6 ♀ (MNHU); Santiago, 11-II-1901, 1 ♂, 1 ♀ (MNHU);

s.l., Puelma, 1♂, 1♀ (MNHU); Contulmo, 8-V-1903, 3♀(MNHU); 2♂, 4♀ (MNHU); Concepcion, -VIII-1903, P.Herbst, 2♂,3♀ (DEI), 4-IX-1949, A. Faz, 3♂ 1♀ (DEI); Panguipulli, South,-XII-1926, s.c., 12♂, 10♀ (DEI), Victoria, Prov. Malleca, 1♀ (DEI); Limache, -II-1926, A. Faz. 2♂ (DEI); 1911, C.E. Porter, 1♀ (MNHN); 1912, s.c. 3♂, 1♀ (MNHN); 1909 s.c., 1♂(MNHN); 1895, G. Fallou, 1♂, 1♀ (MNHN); Gay, 1♀ (MNHN); 1♀ (MNHN); 1♂(IRSNB); 1♂, 2♀ (BMNH); El Bolson, 17-XI-1959, A.Kovacs, 2♂ (BMNH); V.Margo-Margo, C.E. Porter, 1♂ (BMNH); Cortaderal 13-15-II-1899, 1♀ (MNHU); Panguipulli. Villa Rica, South Chile, S.V. Engesser, 2♀ (MNHU), Novara Exp. 1♂(NM); Santiago, 30-XII-1926, F.M. Edwards 1♀ (BMNH); Araucania, South Chile, 1♂(BMNH); Valparaiso, Reed, 1♂,1♀(ZSBS); s.d.,1♀ (MLP); s.l., 1♀ (MLP). PARAGUAY: Sapucay, W. Forster, 1♂,1♀ (BMNH). PERU: 1♀ (IRSNB).

Venezo chilensis concaviusculus (Berg) comb.n

Leptoglossus concaviusculus Berg, 1892:70

Differential diagnosis: Diagnosis see Allen 1969:88.

Measurements and Ratios: (see table 48).

Geographical distribution: (Map 17) Its distribution range extends on Northern and north eastern part of Argentina, Paraguay, Uruguay and Brasil in the latter has been collected

in the north up to the state of Bahia, although it seems to be most common in southern Brasil.

Material examined.

ARGENTINA: Misiones, Loreto, 5-III-1930, 20♂, 20♀ (ZI); Quitilipi, Chaco, 5-II-1942, 1♂(ZSBS); 9-XI-1940, 1♀(ZSBS); Misiones, SanIgnacic. Villa Lutecia, 1910, E.R. Wagner, 1♂(MNHN), Mendoza, Jensen-Haarup, 1♀ (UZM); Rio Plata Kroger, 1♂, 1♀ (UZM); Parana, 1♂ (ZMU); Chaco, 28-X-II-XI-1933, K.J. Hayward,1♂(BMNH); Isla Los Cisnes, V-XI-1970, H.E.Box, 1♂(BMNH); Puerto Aguirre, Alto Parana, 21-26-I-1934, K.J. Hayward 1♂, (BMNH); Terr. Misiones, F.M. Edwards, 2♂(BMNH); Chaco, Roque Saenz Peña, 1932, K.J. Hayward, 1♀ (BMNH); Villa Ana, Oct., 1925, s.c., 1♀(BMNH); Prov. de Córdova, Soconcho,-II-1919, 1♀ (MLP); Corrientes, -X-1935, 1♀ (MLP); Prov. Buenos Aires, Bos 1♀ (MLP); Delta Abra Vieja, 15-II-1926, 1♂ (MLP); Entre Rios, Concordia, IV-1939, 1♀ (MLP); Corrientes, I - 1921, De Carlo, 1♂(MLP); Neuquen XII-1932, Korhler, 1♂ (MLP); Formosa, 28-IV-1936, 2♂(MLP); Puerto Tirol, 10-IV-1936, 2♀ (MLP); Formosa. Dto. Pilaga, IV-1938, 1♀ (MLP); Fontana, -XII-1935, 1♂(MLP); La Plata, C. Bruch, 1♂(MLP); San Ignacio, Misiones, 8-XII-1941, Biraben-Bezzi, 1♂, 1♀ (MLP); La Plata, 1♂(MLP); Córdoba Villa Maria, III-1939, N.Parko, 1♂ (MLP); Córdoba, A. Gracia, 4-I-1939. C. Bruch, 1♂(MLP); Entre Rio. Concordia, II-1930. 1♂ (MLP); Corrientes. San Roque,

1 ♂ (MLP); Sgo. del Estero, Rio Salado, Wagner, 1 ♂(MLP); Misiones, Pindapoy, X-1935, 1 ♂ , 4 ♀ ,(MLP). BRASIL: 1895, G. Fallou, 1 ♂(MNHN); Nova Teutonia, 29-IX-1947, F.Plaumann, 1 ♀(IRSNB); s.l., 24-III-1938, s.c., 1 ♂(ZMU); s.l., 4-IV-1938, s.c., 1 ♂(ZMU); s.l., 9-VI-1938 s.c., 1♀ (ZMU); Sao Paulo, Piracicaba, Bondar, 8♂ 4♀ (ZI); Sao Paulo, 1♂ , 1♀ (TM); Rio Grande do Sul, 2♂ , 2♀ (NM); s.l., Stieglmayr 6♂ , 9♀ (NM); Natterer, 1♂ , 4♀ (NM).Sao Paulo, 2♀ (NM); Sao Leopoldo, 2♀ (NR); Sao Paulo, A. Heine. 1♂ , 1♀ (NR); Rio Grande do Sul, 1♀ (NR); 1♂ (UZM); Bahia, Kruger, 2♂ (UZM); Rio de Janeiro, 1♀ (UZM); Pelotas, 14-III-1956; Rio.G. do Sul, 1♂ (BMNH); Santos, 1♀ (MNHU); Rio, M.Berol, 1♂ (RNH), R. Gr. do Sul, Cruz Alta, 1♀ (RNH); R.Gr. do Sul. 1♂ (MLP); C. Biezanko, 2♂ , 1♀ (DEI); Sta. Cruz. 1♂ (DEI); Santos. 5♂ , 2♀ (MNHU); 5♂ ,2♀ (MNHU); Schott, 1♂ (NM) P. Allegre, R. Gr. do Sul, IV-1962, C. Arravio, 2♀ (MRCN); Viamao, R. Gr. do Sul, 3-XI-1963 (MRCN); P.Fundo, R. Gr. do Sul. 5-IV-1963, 1♂ (MRCN). PARAGUAY: San Bernadino, Fiebrig, 1♂ ,1♀ (NM); Villa Rica, Jensen-Harrup, 1♀ (UZM); s.l., -III-1925, F. Schade, 1♂ (ZMU); Gounelle, 1♂ (MNHN); Aregua, 12-IX-1936, E. le Moult, 1♂ 1♀ (RNH); Asunción, 22-II-25 IV-1936. B. Podtiaguine, 1♂ (RNH); 1♂ (MLP). URUGUAY: Montevideo, 5♂ , 4♀ (MNHU); Boucard, 1♀ (NR), Montevideo, 2♂ (IRSNB); Montevidea, Colon, 2-V-1896, 1♀ (BMNH); 1♀ (MLP); Artigas San Tacuarembó arroyo, Laureles,11-II-1954, 6♀(URDE); Rocha Laguna Merin,desembocadura Rio Cebollati,21-II-1962, C.S. Carbonell, L.C. Zolessi, 1♀ (URDE).

Plate 48

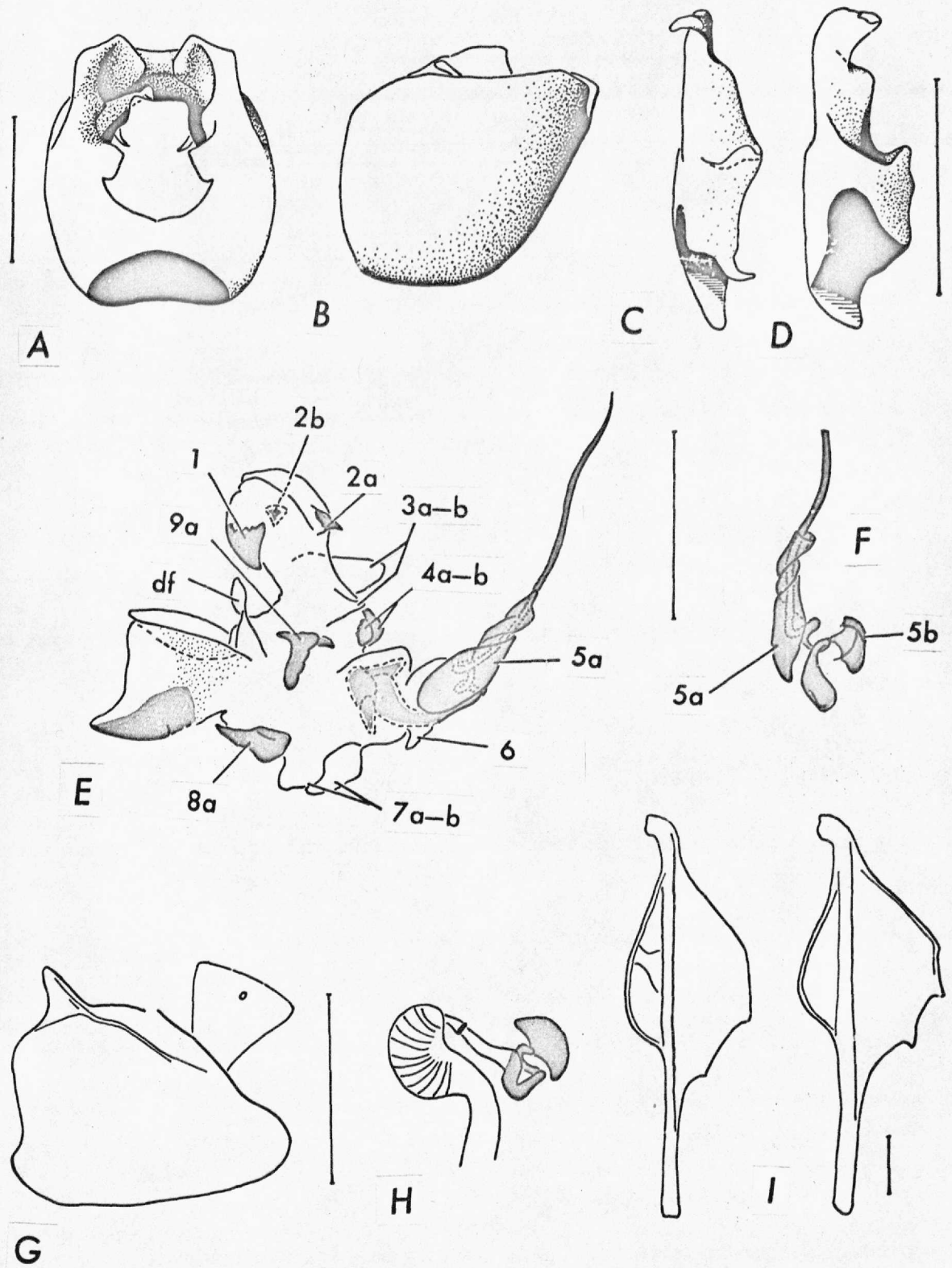


Table 47. Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	13.0–14.0	13.4	5	12.0–15.4	14.1
2 Head length	5	2.09–2.28	2.17	5	1.90–2.47	2.28
3 " width	5	1.90–1.95	1.92	5	1.23–2.16	1.83
Distance:						
4 inter-ocular	5	1.00–1.06	1.04	5	1.00–1.27	1.13
5 ante-ocular	5	1.06–1.14	1.09	5	1.02–1.33	1.19
Antennae:						
6 segm. I length	4	2.14–2.28	2.22	5	1.90–2.28	2.16
7 " II "	4	2.88–3.21	3.02	5	2.25–3.16	2.85
8 " III "	4	1.92–2.06	2.01	4	1.63–2.16	1.87
9 " IV "	2	2.44	2.44	3	2.30–2.68	2.50
Labium:						
10 segm. I length	5	1.52–1.84	1.67	5	1.61–1.99	1.85
11 " II "	5	1.52–1.78	1.59	5	1.90–1.36	1.65
12 " III "	5	0.91–0.96	0.94	5	0.79–1.14	1.00
13 " IV "	5	1.29–1.72	1.43	5	1.14–1.91	1.57
14 Pronotum length	5	2.44–2.83	2.61	5	2.49–3.36	3.00
15 " width	5	4.22–5.04	4.58	5	4.89–5.95	5.40
16 Scutellum length	4	1.52–1.82	1.61	4	1.69–1.91	1.83
17 " width	4	1.71–1.90	1.79	4	1.71–2.39	2.07
18 Hind tibia length	3	5.76–7.10	6.28	5	5.90–6.72	6.27
Tibial dilation:						
19 total width	3	1.53–1.92	1.66	5	1.53–2.16	1.84
external part:						
20 length	3	2.88–4.46	3.47	5	3.07–4.08	3.64
21 width	3	0.91–1.34	1.07	5	0.96–1.48	1.12
internal part:						
22 length	3	2.30–2.88	2.51	5	2.06–2.88	2.46
23 width	3	0.38–0.48	0.43	5	0.38–0.52	0.43
24 Undilated portion	3	2.11–2.40	2.22	5	1.44–2.30	2.02
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.83–6.69:1	6.17:1	5	5.90–6.55:1	6.18:1
1 / 18	3	1.97–2.30:1	2.13:1	5	2.03–2.44:1	2.24:1
2 / 3	5	1.08–1.18:1	1.13:1	5	1.11–1.91:1	1.24:1
6 / 2	5	0.93–1.07:1	1.02:1	5	0.89–1.00:1	0.94:1
10 / 2	5	0.71–0.85:1	0.76:1	5	0.75–0.85:1	0.81:1
9 / 6	2	1.08–1.14:1	1.11:1	3	1.02–1.19:1	1.13:1
15 / 16	4	2.76–2.95:1	2.85:1	4	2.85–3.17:1	3.02:1
20 / 18 %	3	50.0–62.8	55.2	5	51.5–69.1	58.0
22 / 18 %	3	38.3–40.7	39.9	5	34.6–44.1	39.2

Table 48 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body lenght	5	11.7-13.0	12.4	5	13.0-14.0	13.6
2 Head length	5	1.90-2.22	2.10	5	2.09-2.39	2.22
3 " width	5	1.67-1.82	1.74	5	1.80-1.91	1.85
Distance:						
4 inter-ocular	5	0.93-1.04	0.98	5	1.04-1.14	1.07
5 ante-ocular	5	1.00-1.23	1.09	5	1.10-1.19	1.15
Antennae:						
6 segm. I length	5	2.05-2.58	2.24	5	1.93-2.33	2.12
7 " II "	5	2.64-3.36	2.91	5	2.49-3.12	2.79
8 " III "	4	1.82-2.16	1.97	5	1.72-2.25	1.97
9 " IV "	4	2.54-2.97	2.80	4	2.30-2.68	2.48
Labium:						
10 segm. I length	5	1.57-1.71	1.66	5	1.44-1.88	1.71
11 " II "	5	1.33-1.52	1.43	5	1.38-1.65	1.50
12 " III "	5	0.85-0.95	0.90	5	0.85-0.98	0.92
13 " IV "	5	1.21-1.36	1.26	5	1.25-1.42	1.34
14 Pronotum length	5	2.40-2.54	2.47	5	2.54-3.12	2.83
15 " width	5	4.03-4.84	4.45	4	5.04-5.85	5.20
16 Scutellum length	4	1.36-1.63	1.53	5	1.61-1.90	1.73
17 " width	4	1.52-1.82	1.68	5	1.80-2.18	1.94
18 Hind tibia length	3	6.29-7.48	6.76	4	6.24-7.68	6.83
Tibial dilation:						
19 total width	3	1.96-2.83	2.28	4	1.92-3.07	2.37
external part:						
20 length	3	4.41-5.42	4.87	4	4.36-5.56	5.06
21 width	3	1.34-1.96	1.59	4	1.44-2.06	1.60
internal part:						
22 length	3	2.59-3.21	2.97	4	2.54-3.64	2.98
23 width	3	0.43-0.52	0.46	4	0.48-0.56	0.51
24 Undilated portion	3	1.34-1.53	1.43	4	1.20-1.72	1.52
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.54-6.22:1	5.90:1	5	5.85-6.50:1	6.12:1
1 / 18	3	1.73-1.98:1	1.83:1	4	1.82-2.08:1	1.99:1
2 / 3	5	1.13-1,26:1	1.20:1	5	1.13-1.28:1	1.20:1
6 / 2	5	0.92-1.23:1	1.06:1	5	0.89-1.00:1	0.95:1
10 / 2	5	0.70-0.87:1	0.79:1	5	0.64-0.82:1	0.77:1
9 / 6	4	1.13-1.33:1	1.22:1	4	1.15-1.24:1	1.19:1
15 / 16	4	2.80-2.96:1	2.91:1	4	2.78-3.07:1	2.93:1
20 / 18 %	3	70.1-73.6	72.0	4	66.3-89.1	74.0
22 / 18 %	3	41.1-47.8	43.9	4	40.7-47.3	43.6

Veneza impicta (Stål) 1859 combin.

(Plate 48)

Anisoscelis impicta Stål, 1859: 233. Holotype ♂ Uruguay, (NR) [examined]

Theognis impictus (Stål): Mayr, 1866: 104

Leptoglossus impictus (Stål): Stål, 1870: 164; Berg, 1879: 72; Lethierry & Severin, 1894: 48; Pennington, 1922: 131-2; Allen, 1969: 91.

General and differential diagnosis: Hind femora in males incrassate with numerous prominent tubercles (15-20 on dorsal surface).

V. impicta is very closely related to V. quadricollis, V. dentata and particularly to V. chilensis; from the latter it can be distinguished by more robust appearance, and the males also by the condition of the femur which in chilensis is comparatively narrow with only 5-10 tubercles on the dorsal surface. For differences between V. impicta and the other two species (quadricollis and dentata) see discussions and descriptions of these species.

Description: General characters see Allen, 1969: 91. Male and female genitalia closely resemble those of V. chilensis.

Measurements and Ratios: (see table 49)

Geographical distribution: (Map 18) Only known from Argentina and Uraguay.

Material examined

a) Type material: Holotype ♂ of Anisoscelis impicta Stål from Uraguay, Montevideo, labelled "Typus, Montevideo, Kirb." in NR collection.

b) Other material: ARGENTINA: San Luis, Lavalsse, Estancia Don Roberto, 12 - X - 1942, 1 ♂, 2 ♀ (BMNH); Cordoba, La Falda, 975m, 17 - II - 1958, 1 ♂, 2 ♀ (ZSBS); Cordoba, Grandom 1000m, 6 - III - 1958, 2 ♂, 2 ♀ (ZSBS); Sta. Fe, Roasrio, 1 ♀ (ZSBS); Salta, Chicoana, on Tobacco, 1 ♀ (MLP); Rio Negro, R. Colorado, XII - 1930, 1 ♀ (MLP); Santa Fe, 1 ♀ (MLP); Cordoba, - III - 1944, 1 ♀ (MLP); Sgo. del Estero, Rio Salado, Wagner, 1 ♀ (MLP); Prov. Sanitago del Estero, Rio Salado, Averias, 1909, E.R. Wagner, 3 ♂, 1 ♀ (MNHN); Chaco de Santa Fé, Las Garzas, 1903, s.c., 1 ♂, 1 ♀ (MNHN); Patagonia, Prov. Mendoza, San Rafael, 680m, 1905, A. Tournover, 2 ♂, 1 ♀ (MNHN); Chaco de Coria, Prov. Mendoza, Jensen-Haarup, 2 ♂, 2 ♀ (UZM); s.d., 1 ♂, 1 ♀ (IZA); Pedregal, Mendoza, 9 - XII - 1906, 1 ♀ (UZM); s.l., 28 - I - 1907, Jensen-Haarup, 1 ♂ (UZM); s.l., 13 - II - 1907, s.c., 2 ♀ (UZM); s.l., 19 - III - 1907, s.c., 1 ♀ (UZM); s.l., 24 - I - 1907, s.c., 1 ♀ (IZA); s.l., 26 - I - 1907, s.c., 1 ♂ (IZA); Mendoza, 12 - III - 1906, s.c., 1 ♂ (UZM); s.l., 26 - II - 1908, s.c., 1 ♂, 1 ♀ (UZM); Mendoza, no date, anon., 1 ♂ (TM); s.l., H. Rolle, 2 ♂ (DEI); Cordoba, H. Stempelmann, 1 ♂ (DEI); Rosario de Sta Fé, s.c., 1 ♂ (DEI).

Table 49 Measurements (3 ♂♂ and 4 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	12.0-13.5	12.7	4	12.2-14.0	13.3
2 Head length	3	2.07-2.26	2.14	4	2.07-2.10	2.24
3 " width	3	1.82-1.88	1.86	3	1.76-1.93	1.88
Distance:						
4 inter-ocular	3	1.02-1.14	1.10	4	1.04-1.10	1.12
5 ante-ocular	3	1.08-1.14	1.10	4	1.08-1.23	1.16
Antennae:						
6 segm. I length	3	2.07-2.10	2.08	4	1.74-2.28	1.97
7 " II "	3	2.78-3.18	2.91	4	2.35-2.97	2.73
8 " III "	3	1.92-2.11	1.98	4	1.68-2.20	1.99
9 " IV "	3	2.06-2.40	2.22	4	1.92-2.20	2.21
Labium:						
10 segm. I length	3	1.63-1.71	1.65	4	1.76-1.86	1.77
11 " II "	3	1.53-1.61	1.56	4	1.48-1.74	1.66
12 " III "	3	0.96-1.08	1.02	4	0.95-1.08	1.03
13 " IV "	3	1.38-1.52	1.46	4	1.44-1.57	1.51
14 Pronotum length	3	2.64-2.73	2.59	4	2.35-3.02	2.73
15 " width	3	4.60-5.32	5.05	4	4.22-6.05	5.30
16 Scutellum length	3	1.52-1.80	1.67	4	1.38-1.90	1.73
17 " width	3	1.70-2.01	1.86	4	1.53-2.24	1.94
18 Hind tibia length	3	6.14-6.62	6.39	3	5.80-7.48	6.66
Tibial dilation:						
19 total width	3	1.53-1.72	1.65	3	1.58-2.40	2.11
external part:						
20 length	3	3.26-3.55	3.43	3	3.40-4.60	4.04
21 width	3	0.96-1.00	0.97	3	0.91-1.39	1.23
internal part:						
22 length	3	2.40-2.68	2.54	3	2.25-3.36	2.83
23 width	3	0.38-0.43	0.41	3	0.48-0.58	0.52
24 Undilated portion	3	2.17-2.30	2.23	3	1.87-2.30	2.06
Ratios: (figures refer to character numbers above).						
1 / 2	3	5.66-6.42:1	5.93:1	4	5.66-5.89:1	5.93:1
1 / 18	3	1.95-2.03:1	1.98:1	3	1.84-2.10:1	1.99:1
2 / 3	3	1.13-1.20:1	1.15:1	3	1.17-1.27:1	1.19:1
6 / 2	3	0.92-1.00:1	0.97:1	4	0.79-0.97:1	0.87:1
10 / 2	3	0.72-0.81:1	0.77:1	4	0.73-0.83:1	0.79:1
9 / 6	3	0.97-1.14:1	1.06:1	4	1.02-1.19:1	1.12:1
15 / 16	3	2.95-3.02:1	3.02:1	4	2.85-3.25:1	3.06:1
20 / 18 %	3	49.2-57.8	53.6	3	58.6-61.4	60.6
22 / 18 %	3	37.3-41.3	39.7	3	38.7-44.9	42.4

Veneza quadricollis (Westwood) 1842 comb.n

(Plate 49)

Anissocelis quadricollis Westwood, 1842: 17. Holotype ♀ Brasil (UM) [examined].

Anisoscelis insconspicuus Stål, 1860: 32. Lectotype ♂ Brasil (NR), designated by Allen, 1969: 93 [Synonymized by Stål, 1870: 164; examined]

Theognis pulcher Mayr, 1865: 434. Holotype ♂ Brasil (NM). [Synonymized by Stål, 1870: 164; examined]

Leptoglossus quadricollis (Westwood): Stål, 1870: 164; Lethierry & Severin, 1894: 48; Allen, 1969: 93.

Leptoglossus impressicollis Berg, 1892: 69. Holotype ♂, Argentina (MLP). [synonymized by Allen 1969: 93; examined]

General and differential diagnosis: Tibial dilation foliaceous and large, with one shallow and three deep emarginations; lateral margins very slightly serrate. Characteristic features of ♂♂: shape and size of genital capsule, paramere and processes 4a-b, 9a-b and 5a. Those of ♀♀: shape and size of 1st gonocoxa and spermatheca.

These characters distinguish V. quadricollis from the closely related V. chilensis, V. impicta and V. dentata.

Description: General characters see Allen, 1969: 93.

Male genitalia: Genital capsule (fig. A,B) - posterior margin slightly below the lateral margins, inflected, without dorsal prongs, with wide rounded median notch, the surface of the inflected part with two small lateral prominences (a); lateral margins straight or very slightly convex, barely flared. Paramere (fig. C,D) - outer lobe stout and rounded; shank thin and elongate, with very small median lobe; hook short, well apart from the outer lobe, broadly curved and terminating in a wide pointed, medially curved tip. Phallus (fig, E) - as in V. chilensis except for: process 1 less sclerotized, somewhat rugose with truncate tip; processes 2a-b stout not very pointed; processes 4a-b narrow but more prominent; 9a-b subtriangular, with short and wide tip; 5a (fig. E,F) with long blind convolution.

Female genitalia: Ist gonocoxa and VIIIth laterotergite see fig. G; spermatheca (fig. H) with subovoidal duct dilation; tubular portion of the duct long, rapidly widening near the duct dilation.

Measurements and Ratios: (see table 50)

Geographical distribution: (Map 18) Only known from southern Brasil and Argentina.

Discussion: The material examined showed considerably variation in size of the tubercles on median part of the calli, ranging from small protuberances to horn-like, sometimes asymmetric processes. Little variation was found in the colour pattern among the material but yellow

pronotum with black spots was reported by Allen (1969).

Material examined

a) Type material: Holotype ♀ of Anisoscelis quadricollis Westwood, from Brasil, labelled "Type Hem. 330, Anisoscelis quadricollis Westwood, Rio." in UM collection.

Lectotype ♂ of Anisoscelis inconspicuous Stäl from Brasil, labelled "Rio Jan. Stäl" in NR collection.

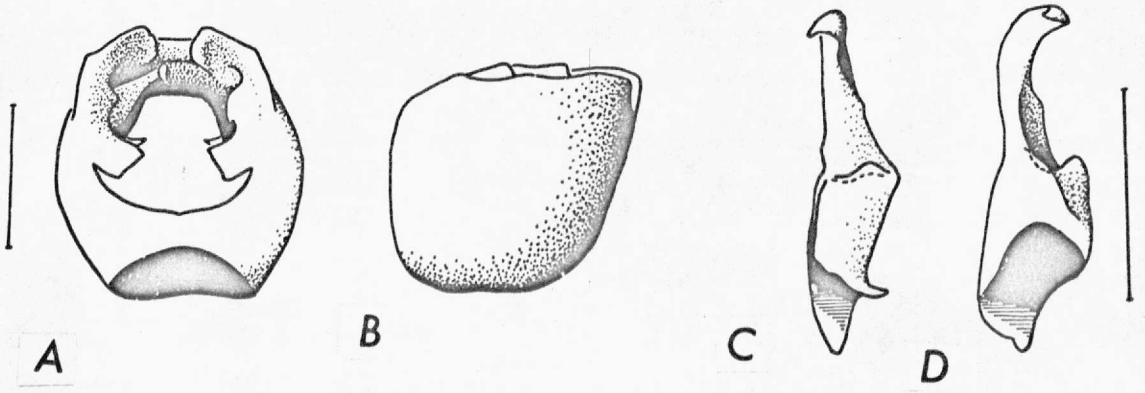
Syntypes: All from Brasil, 1 ♂ labelled "paralectotypus, Brasil, F. Sahlb"; 1 ♀ labelled "Typus, Rio Janeiro, F. Sahlb"; 1 ♀ labelled "Allotypus, Brasil" in NR collection.

Holotype ♂ of Theognis pulcher Mayr, from Brasil, labelled "Brasilien, pulcher det Mayr" in NM collection. A holotype label was attached to the specimen.

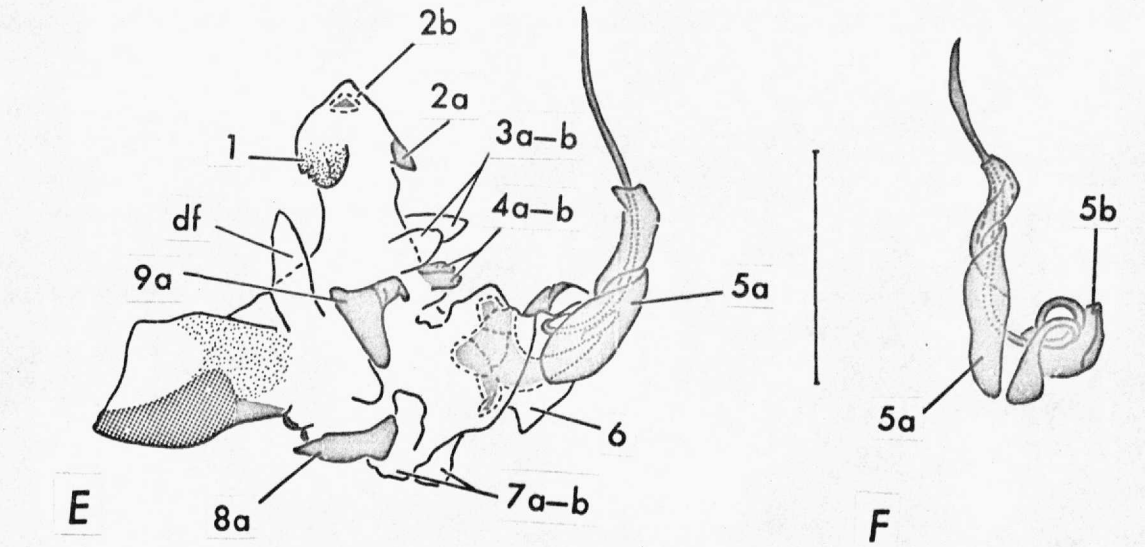
Holotype ♂ of Leptoglossus impresicollis Berg, from Argentina, labelled "Typus, Corrientes, Leptoglossus impressicollis 1891 Berg, 1431" in MLP collection, to which the holotype label has been attached. The specimen however has another label: "Leptoglossus concaviusculus segun Berg, R.C. Allen det. 68". This label and the hand writing is different from Allen's labels, and according to the information of the MLP (in litt.) it was made in the musuem following Allen's instructions; it is obvious that due to some misunderstanding the specimen was wrongly labelled. I have left this label attached to the specimen, but to avoid confusion in the future it should be removed and destroyed.

b) Other material: BRASIL: Petropolis, Feb. 1857, H. Clark, 1 ♂, 1 ♀ (BMNH); Tejuca, Jan. 1857, s.c., 1 ♀ (BMNH); Rio, M. Berol, 1 ♀ (RNH); 1 ♀ (MNHN); Schott, 1 ♂ (NM); Rio de Janeiro 1 ♀ (IZA).

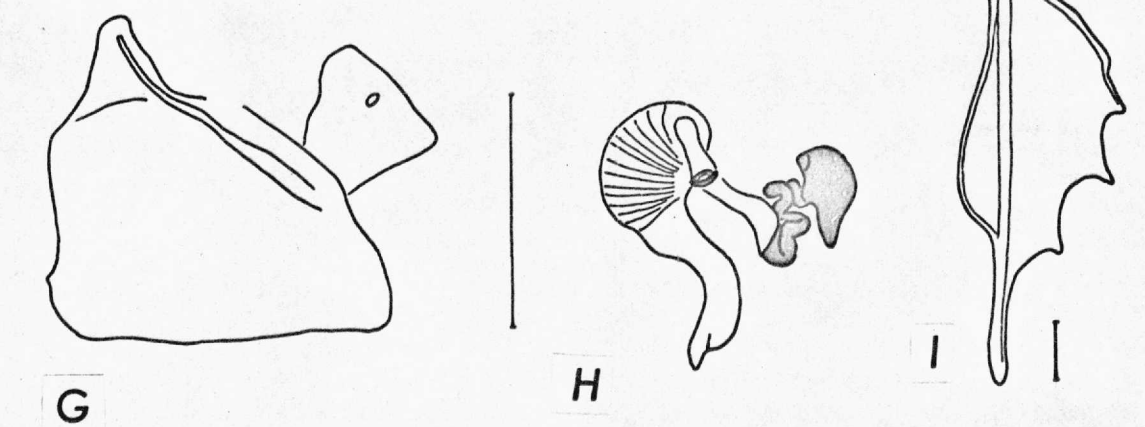
Plate 49



A B C D



E F



G H I

Table 50 Measurements (4 ♂♂ and 4 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	14.0–15.0	14.6	4	14.0–15.0	14.4
2 Head length	4	2.24–2.45	2.32	4	2.33–2.47	2.41
3 " width	4	1.91–1.93	1.92	4	1.90–1.99	1.95
Distance:						
4 inter-ocular	4	1.02–1.06	1.04	4	1.00–1.14	1.07
5 ante-ocular	4	1.14–1.21	1.16	4	1.15–1.19	1.17
Antennae:						
6 segm. I length	4	2.47–2.60	2.55	4	2.26–2.37	2.32
7 " II "	4	3.45–3.74	3.60	3	3.12–4.36	3.61
8 " III "	4	2.40–2.49	2.44	2	2.40–2.88	2.64
9 " IV "	2	2.97–3.16	3.06	1	2.92	2.92
Labium:						
10 segm. I length	4	1.91–2.18	2.06	4	1.71–2.12	1.97
11 " II "	4	1.90–1.93	1.90	4	1.71–1.99	1.87
12 " III "	4	0.95–1.14	1.05	4	0.87–1.00	0.95
13 " IV "	4	1.72–1.95	1.85	4	1.33–1.90	1.72
14 Pronotum length	4	2.68–2.92	2.80	4	2.88–3.16	2.98
15 " width	4	4.89–5.23	5.02	4	4.84–5.28	5.15
16 Scutellum length	4	1.59–1.90	1.75	4	1.76–1.90	1.86
17 " width	4	1.86–2.05	1.95	4	1.88–2.09	1.98
18 Hind tibia length	4	7.63–8.54	8.20	4	6.72–8.25	7.47
Tibial dilation:						
19 total width	4	2.78–2.97	2.87	4	2.59–3.16	2.94
external part:						
20 length	4	5.76–6.14	5.95	4	5.04–6.00	5.41
21 width	4	1.92–1.96	1.95	4	1.58–2.25	1.95
internal part:						
22 length	4	4.22–5.28	4.53	4	3.69–4.75	4.17
23 width	4	0.52–0.56	0.55	4	0.52–0.72	0.60
24 Undilated portion	4	1.68–1.87	1.78	4	1.53–1.77	1.60
Ratios: (figures refer to character numbers above).						
1 / 2	4	6.06–6.69:1	6.29:1	4	5.87–6.07:1	5.97:1
1 / 18	4	1.69–1.83:1	1.78:1	4	1.75–1.97:1	1.92:1
2 / 3	4	1.17–1.26:1	1.20:1	4	1.19–1.24:1	1.23:1
6 / 2	4	1.06–1.15:1	1.09:1	4	0.95–0.99:1	0.96:1
10 / 2	4	0.83–0.97:1	0.88:1	4	0.69–0.87:1	0.81:1
9 / 6	2	1.15–1.21:1	1.18:1	1	1.26:1	1.26:1
15 / 16	4	2.75–3.10:1	2.86:1	4	2.75–2.77:1	2.76:1
20 / 18 %	4	70.2–75.4	72.5	4	70.8–75.0	72.4
22 / 18 %	4	50.5–62.8	55.2	4	48.6–58.8	55.8

Veneza dentata (Berg) 1892 comb.n

(Plate 50)

Leptoglossus dentatus Berg 1892: 68. Holotype ♀ Argentina (MLP) [examined]

Leptoglossus dentatus Berg: Lethierry & Severin, 1894: 47; Pennington, 1922: 133.

General and differential diagnosis: Lateral and postero lateral margins dentate and serrate respectively; metapleura with a black patch; tergites with yellow markings. Characteristic features of ♂♂: shape and size of genital capsule, paramere and of the processes 4a-b, 9a-b and 5a. Those of ♀♀: shape and size of Ist gonocoxa and spermatheca.

V. dentata shows close relationships with V. chilensis, V. impicta and V. quadricollis, and can be distinguished from these species by the characters mentioned above.

Description: General characters see Allen 1969: 95.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with very wide rounded notch, and low dorsal prongs, the inflected part of posterior margin thick, with two lateral prominences (a); posterior margin slightly below the lateral margins; the latter very slightly sinuous and moderately flared. Paramere (fig. C,D) - outer lobe small and subtriangular;

shank thin and long with prominent median lobe; hook short close to median lobe, rather wide, moderately curved and terminating in a flat, wide, medially curved tip. Phallus (fig. E) - as in V. chilensis except for: process 1 somewhat more apical; processes 2a-b stout, not sharply pointed; processes 4a-b considerably longer, particularly 4b which is longer and larger than 4a; 9a-b acute, triangular, with long pointed tip; 5a (fig. E,F) with the second convolution considerably thicker and shorter, and the third convolution almost completely closed.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with subovoidal duct dilation; proximal portion of the duct short and very wide.

Measurements and Ratios: (see table 51)

Geographical distribution: (Map 18) Only known from Argentina, Paraguay and Uraguay (Mann, 1969).

Material examined

a) Type material: Holotype ♀ of Leptoglossus dentatus Berg, from Argentina, labelled "Typus, Cordoba, Leptoglossus dentatus 1891 Berg, 367, 1429" in MLP. A holotype label has been attached to the specimen. The specimen has another label: "Leptoglossus concaviusculus segun Berg, R.C. Allen det. 68" (see comments about this label in V. quadricollis).

b) Other material: ARGENTINA: Chaco, Roque, Saenz Pena, 1932, K.J. Hayward, 1 ♂ (BMNH); El Jabali, 11 - III - 1931, J.B. Anderson, 1 ♀

(BMNH); Prov. de Santiago del Estero, Barrancas, 1909, E.R. Wagner, 2 ♂ (MNHN); Chaco de Santiago del Estero, La Palisa, 1903, s.c., 1 ♂ (MNHN); s.l., Rio Salado, s.d., s.c., 6 ♂, 1 ♀ (MNHN); s.d., 1 ♂ (ZMU); s.d., 1 ♂ (RNH); Chaco de Santa Fe, Las Garzas, s.d., s.c., 2 ♀ (MNHN); La Falda, Cordoba, 975m, 17 - II - 1958, 1 ♀ (ZSBS); Jensen-Haarup, 1 ♂ (ZMU); Charata 1 ♀ (MLP); Corzuela, 8 - I - 1936, 1 ♀ (MLP); 1 - IV - 1938, S. Pena, S/Algodonero, 1 ♀ (MLP); Santiago del Estero, Wagner, 2 ♀ (MLP); Prov. de la Rioja, 1 ♀ (MLP); Chaco Las Breñas, III - 1941, 2 ♂ (MLP); Chaco Asila Leg. Borg, 1 ♀ (MLP); S. del Estero, Fernandez, 30 - I - 1939, s.c., 1 ♂ (MLP); Cordoba, Mar Chiquito, 22 - I - 1940, Biraben, 1 ♂ (MLP); Sgo. del Estero, Rio Salado, Wagner, 2 ♀ (MLP). PARAGUAY: Chaco, Nanawa, A. Pride, 1 ♂ (BMNH).

Plate 50

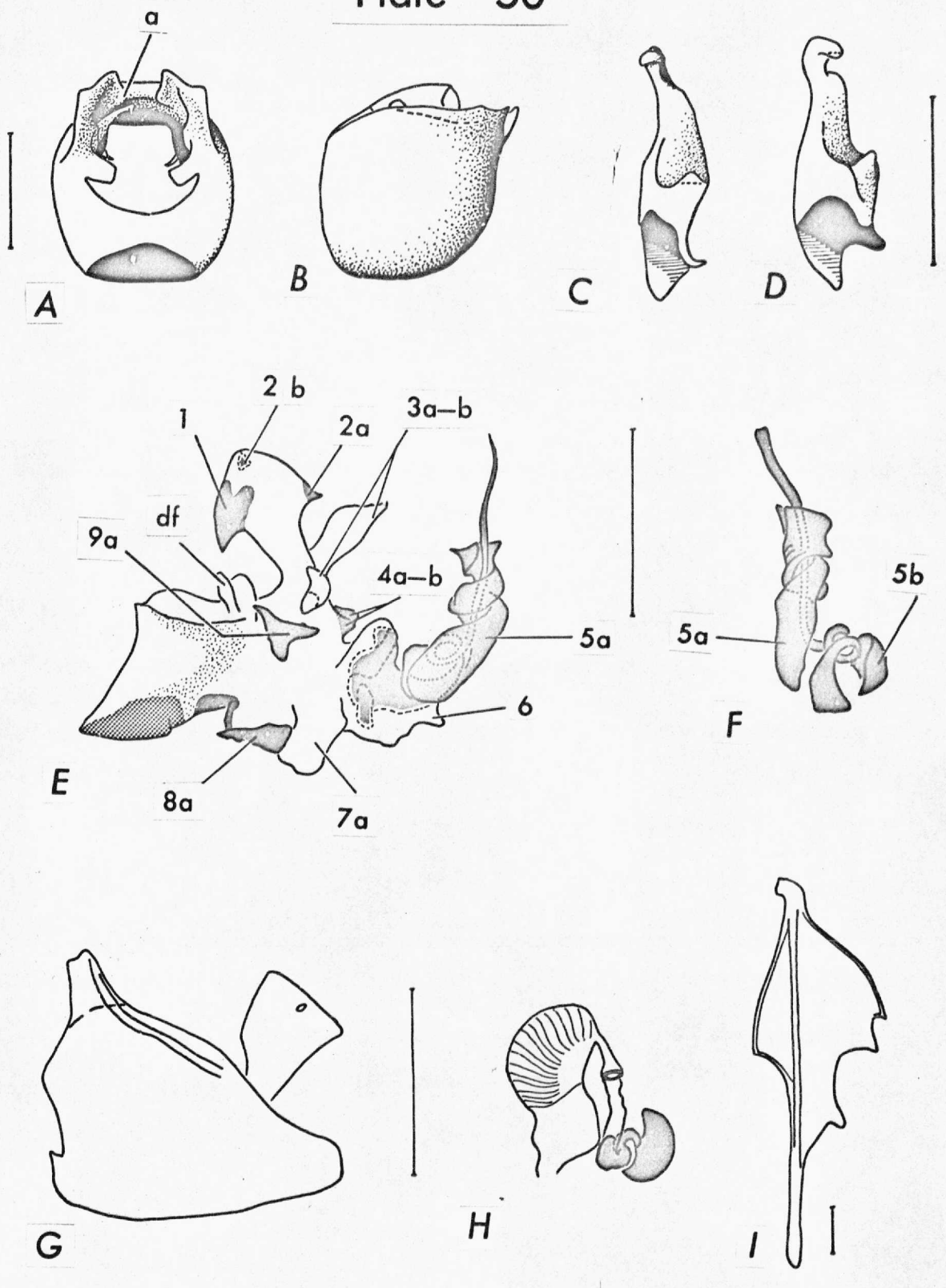


Table 51 Measurements (4 ♂♂ and 5 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	13.7-15.0	14.2	5	16.0-17.7	16.9
2 Head length	4	2.28-2.58	2.42	5	2.56-2.66	2.62
3 " width	4	1.99-2.10	2.05	5	2.16-2.24	2.22
Distance:						
4 inter-ocular	4	1.12-1.25	1.16	5	1.25-1.33	1.29
5 ante-ocular	4	1.15-1.29	1.22	5	1.33-1.42	1.37
Antennae:						
6 segm. I length	4	2.28-2.66	2.42	5	2.47-2.81	2.63
7 " II "	4	3.12-3.74	3.37	5	3.60-3.84	3.73
8 " III "	4	1.92-2.40	2.17	5	2.40-2.44	2.41
9 " IV "	2	3.12-3.31	3.21	4	3.40-3.93	3.70
Labium:						
10 segm. I length	4	1.80-1.90	1.87	5	1.99-2.12	2.07
11 " II "	4	1.67-1.74	1.70	5	1.78-1.90	1.84
12 " III "	4	1.02-1.06	1.04	5	1.06-1.15	1.12
13 " IV "	3	1.53-1.59	1.55	5	1.67-1.71	1.73
14 Pronotum length	4	2.49-2.88	2.66	5	2.92-3.36	3.15
15 " width	4	4.22-4.56	4.41	5	5.28-5.52	5.38
16 Scutellum length	3	1.57-1.78	1.68	5	2.01-2.09	2.06
17 " width	3	1.57-1.82	1.70	5	2.05-2.22	2.14
18 Hind tibia length	4	6.72-7.77	7.19	5	7.92-8.73	8.33
Tibial dilation:						
19 total width	4	1.97-2.68	2.26	5	2.44-2.78	2.65
external part:						
20 length	4	4.22-5.28	4.73	5	5.18-5.56	5.36
21 width	4	1.25-1.72	1.47	5	1.44-1.77	1.62
internal part:						
22 length	4	2.59-3.16	2.90	5	3.12-3.55	3.29
23 width	4	0.48-0.62	0.52	5	0.56-0.76	0.60
24 Undilated portion	4	2.16-2.30	2.21	5	2.30-2.59	2.43
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.54-6.18:1	5.86:1	5	6.01-6.83:1	6.45:1
1 / 18	4	1.84-2.11:1	1.97:1	5	1.83-2.20:1	2.02:1
2 / 3	4	1.12-1.23:1	1.18:1	5	1.14-1.23:1	1.18:1
6 / 2	4	0.92-1.06:1	1.00:1	5	0.92-1.09:1	1.00:1
10 / 2	4	0.73-0.82:1	0.77:1	5	0.77-0.81:1	0.79:1
9 / 6	2	1.36:1	1.36:1	4	1.35-1.54:1	1.41:1
15 / 16	3	2.52-2.68:1	2.59:1	5	2.54-2.64:1	2.61:1
20 / 18 %	4	58.6-74.3	65.7	5	61.3-70.2	64.3
22 / 18 %	4	37.9-43.9	40.3	5	38.0-40.6	39.4

Veneza balteata (Linnaeus) 1771 comb.n

(Plate 51)

Cimex balteatus Linnaeus, 1771: 534. NEOTYPE ♀ Jamaica (BMNH) here designated [examined, dissected]

Cimex balteatus Linnaeus: Drury, 1770: 97, pl. 43, fig, 3; Goeze, 1778: 254.1; Fabricius, 1781: 352.87; 1787: 290.109; Gmelin, 1789: 2144.243.

Lygaeus balteatus (Linnaeus): Fabricius, 1794: 142.27; 1803: 213.39.

Anisoscelis fasciatus Herrich-Schaeffer, 1853: 277. Holotype ♀ Haiti (lost). [Synonymized by Stål 1868: 52]

Anisoscelis thoracicus Guérin-Méneville, 1857: 386. Holotype ♂ (lost). [Synonmized by Stål, 1870: 162].

Theognis schaefferi Mayr, 1866: 102.3. Lectotype ♂ Brasil (NM) uncertain designation [examined].

Leptoglossus balteatus (Linnaeus): Stål, 1868: 52.4; 1870: 161.4; Barber, 1939: 310-11; Barber & Bruner, 1947: 80; Wolcott, 1948: 197; Allen, 1969: 97.

Anissocelis selecta Walker, 1871: 127-8. Holotype ♂ Dominican Republic (BMNH). Synonymized by Allen, 1969: 97 [examined].

General and differential diagnosis: Characteristic features of ♂♂: shape and size of genital capsule, parameres and processes 1, 9a-b and 5a.

V. balteata shows close relationships with V. phyllopa sharing the following characters: straight transverse patch on corium, genital capsule with the prominences (a) closely approximated; shank of paramere thin; similar dorsal sac of conjunctiva. V. balteata can be distinguished from V. phyllopa by: two yellow spots or wide yellow patch on pronotum; humeral angles acute to subspinose; raised humeral areas; tibial dilation comparatively short; hind wing unicoloured; dorsal prong present; condition of the outer lobe of paramere and processes 1, 9a-b and 5a.

Description: General characters see Allen 1969: 97.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with very wide rounded to "V" shaped median notch and short rounded dorsal prongs; inflected part of posterior margin with two closely approximated and medially projected rounded prominences (a); posterior margin slightly below the lateral margins; the latter flared and ascending posteriorly. Paramere (fig. C,D) - outer lobe very prominent, subtriangular and narrow; shank thin and elongate with inconspicuous, very wide and rounded median lobe; hook short and wide, moderately close to median lobe, terminating in a short rounded, ventrally concave tip. Phallus (fig. E) - conjunctiva with long uniformly wide dorsal sac with the apex somewhat twisted to the left; conjunctiva armed with the following processes: 1 heavily sclerotized, very conspicuous and thick, with the acute tip well elevated and separated from the conjunctival membrane; 2a-b membranous and very conspicuous, with the distal part heavily sclerotized, 2a pointed and 2b subacute; 3a-b membranous, tapering, both with the apex slightly sclerotized, 3b elongate,

3a shorter; 4a-b very slightly sclerotized, lobuliform and well separated; 9a-b rounded and not very conspicuous, at base membranous with the antero-dorsal margin moderately sclerotized; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate and tapering, second convolution narrow and elongate.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with kidney shaped duct dilation, tubular portion of the duct long with two curvatures.

Measurements and Ratios: (see table 52).

Geographical distribution: (Map 19) Mainly known from the Antilles, but has been collected also in French Guiana and Brasil, and Barber, 1914 reported it from Florida.

Discussion: The following variations were observed among the material examined: Specimens from Jamaica, Cuba and Bahamas (Allen 1969) have two rounded yellow ochre pronotal spots, the Ist antennal segment is basically reddish brown with a dark brown to black band on external surface. On the other hand the specimens from Haiti, Dominican Republic, Puerto Rico, Sta Lucia and Brasil have the wide yellow ochre patch on the declivous area of pronotum narrowed medially and occasionally divided in the middle into two trapezoidal patches; the Ist antennal segment is unicoloured. In Allen's paper there is some discrepancy regarding the colour of the Ist antennal segment in specimens from the two groups of localities; in the redescription of the species based on one specimen from Jamaica the

Ist antennal segment is correctly described as bicoloured, but on the other hand the unicolourus condition is also referred to specimens from Jamaica.

Material examined.

a) Type material: Neotype of Cimex balteatus Linnaeus. The description of this species, of which no specimen exists, was based on an illustration by Drury 1770. This illustration is inaccurate regarding the condition of the hind tibia which is drawn without the tibial dilation and the description of Linnaeus is very brief and may well refer to some other species of the genus. The fact that this species has been commonly confused with very similar V. aucta, support the designation of a neotype for Cimex balteatus Linn. and to that effect a female specimen from Jamaica, Blue Castle, 9 - II - 1922, C.C. Gowdey in BMNH was chosen as neotype and accordingly labelled. This specimen fully agrees with Linnaeus' description and Drury's illustration.

The single misidentified specimen of V. balteata in the Linnaeus collection in the Linnean Society of London is discussed together with V. phyllopa (see below).

Lectotype ♂ and paralectotype ♀ of Theognis schaefferi Mayr, both from Brasil, the former labelled "lectotype, Brasilien, schaefferi, det. Mayr"; the female is labelled simply as Brasilien and was here conveniently labelled as paralectotype. Holotype ♂ of Anisoscelis selecta Walker from Dominican Republic, Santo Domingo, labelled "Type, St. Dom., 55.1, 24. Anissocelis selecta" in BMNH collection.

b) Other material: ANTILLES: Cuba: La Havana, 1908, P. Serre, 1 ♂, 1 ♀ (MNHN); Guasas, 8 - VII - 1933, H.J. MacGillary, 1 ♂, 1 ♀ (RNH); Sierra Guane, 9 - VII - 1933, s.c., 1 ♂, 1 ♀ (RNH); Santa Cruz, 8 - II - 1933, s.c., 1 ♂ (RNH); Guantánamo, E. le Moult, 1 ♂, 1 ♀ (RNH); O.M. Reuter, 1 ♂, 2 ♀ (ZMU); - XI - 1874, Gunblach, 2 ♂, 2 ♀ (MNHU). St. Thomas: Klug, 1 ♂, 1 ♀ (RNH); 2 ♂, 1 ♀ (UZM); 19 - I - 1918, C. Eggert, 1 ♀ (MNHU). Sta Lucia: 1850, Bonnecour, 1 ♂, 1 ♀ (MNHN). St. Croix: 1 ♂ (UZM); C. Eggers, 1 ♂ (UZM). Dominican Republic: Sto. Domingo, 1 ♂ (NM); Guaimati, Jul. 1925, H.E. Box, 1 ♀ (BMNH). Haiti: Cap. Hairen, 16 - VII - 1969, J. Geyskes, 1 ♂ (RNH); K. Boss, 2 ♀ (MNHU); ship near Haiti, 1 ♂ (BMNH). Puerto Rico: 2 ♂, 1 ♀ (MNHU); Quebradillas, 9 - VIII - 1963, P.H.v. Doesburg Jr., 1 ♂ (RNH). BRASIL: Bahia, Kjillerip, 1 ♂ (UZM); FRENCH GUIANA: St. Jean, 1826, 1 ♂, 1 ♀ (UZM).

c) Material without data: 1 ♀, Cat. No. 3 (RNH); 2 ♂, 2 ♀ (NR); 1 ♂ (ZI).

Plate 51

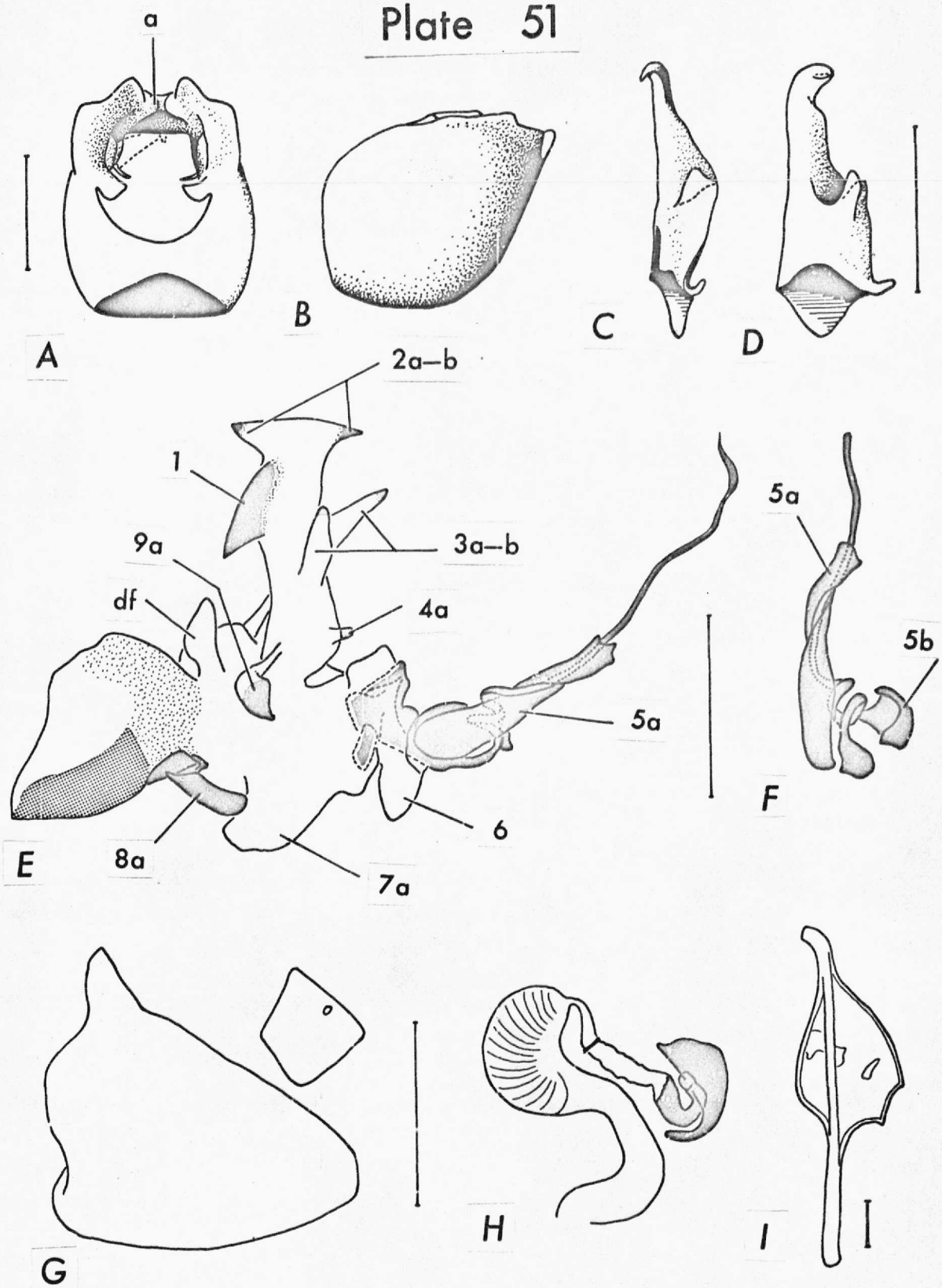


Table 52 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	14.5-17.6	15.9	5	16.0-20.0	17.9
2 Head length	5	2.49-2.86	2.68	5	2.69-3.23	2.88
3 " width	5	1.93-2.24	2.04	5	2.07-2.31	2.24
Distance:						
4 inter-ocular	5	0.98-1.15	1.09	5	1.12-1.33	1.23
5 ante-ocular	5	1.17-1.40	1.28	5	1.33-1.71	1.50
Antennae:						
6 segm. I length	5	2.31-2.75	2.54	3	2.31-3.02	2.69
7 " II "	5	3.31-3.84	3.50	3	3.26-4.27	3.79
8 " III "	5	2.49-2.92	2.67	3	2.59-3.21	2.94
9 " IV "	4	3.88-4.60	4.12	2	4.03-4.27	4.15
Labium:						
10 segm. I length	5	2.09-2.64	2.41	5	2.58-3.21	2.83
11 " II "	5	2.09-2.47	2.28	5	2.51-3.07	2.66
12 " III "	5	1.14-1.40	1.30	4	1.33-1.71	1.50
13 " IV "	5	2.28-2.85	2.66	4	2.60-3.61	3.04
14 Pronotum length	5	2.68-3.60	3.14	5	3.07-4.32	3.83
15 " length	5	4.36-5.95	5.31	4	5.42-7.72	6.39
16 Scutellum length	4	1.88-2.16	1.99	5	1.90-2.47	2.24
17 " width	5	1.80-2.14	2.01	5	2.01-2.54	2.30
18 Hind tibia length	5	6.86-7.68	7.30	4	7.00-9.60	8.40
Tibial dilation:						
19 total width	5	1.82-2.30	2.02	4	2.20-2.97	2.68
external part:						
20 length	5	3.60-4.36	3.97	4	3.55-6.14	5.15
21 width	5	1.05-1.44	1.21	4	1.34-1.92	1.70
internal part:						
22 length	5	2.40-3.16	2.79	4	3.02-4.75	3.95
23 width	5	0.38-0.56	0.48	4	0.52-0.72	0.62
24 Undilated portion	5	2.30-2.64	2.42	4	1.68-3.02	2.47
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.82-6.15:1	5.93:1	5	5.94-6.50:1	6.21:1
1 / 18	5	2.05-2.35:1	2.17:1	4	2.08-2.28:1	2.13:1
2 / 3	5	1.27-1.36:1	1.31:1	5	1.23-1.39:1	1.28:1
6 / 2	5	0.91-0.98:1	0.94:1	3	0.85-0.96:1	0.92:1
10 / 2	5	0.83-0.98:1	0.89:1	5	0.95-1.00:1	0.98:1
9 / 6	4	1.59-1.72:1	1.65:1	2	1.55-1.74:1	1.64:1
15 / 16	4	2.29-2.82:1	2.59:1	4	2.58-3.12:1	2.86:1
20 / 18 %	5	50.7-57.1	54.3	4	50.7-73.5	61.3
22 / 18 %	5	33.8-41.1	38.2	4	43.1-56.8	47.0

Veneza phyllopa (Linnaeus) 1767 comb.n

(Plate 52)

Cimex phyllopus Linnaeus, 1767: 731.113. NEOTYPE ♂ U.S.A. (BMNH) here designated [examined] (see discussion of Linnaeus type).

Cimex phyllopus Linnaeus: Fabricius, 1775: 708.56; Goeze, 1778: 224.113; Fabricius, 1781: 351,80; 1787: 289.99.

Lygaeus phyllopus (Linnaeus): Fabricius, 1794: 139.17; 1803: 210.25; Wolff, 1811: 196.190.

Anisoscelis albicinctus Say 1831: 326.2. Syntypes U.S.A. (lost). [Synonymized by Stål, 1870: 161].

Anisoscelis phyllopus (Linnaeus): Burmeister, 1839: 332.5; Amyot & Serville, 1843: 218.1.

Anisoscelis phyllopa (Linnaeus): Westwood, 1842: 16.

Anisoscelis fraterna Westwood, 1842: 16. Holotype ♀ U.S.A. (UM). [Synonymized by Van Duzee, 1917: 88; examined].

Anisoscelis confusa Dallas, 1852: 453.4. [Synonymized by Stål, 1870: 161].

Theognis phyllopus (Linnaeus): Mayr, 1866: 103.

Leptoglossus albicinctus (Say): Stål, 1868: 52.5.

Leptoglossus phyllopus (Linnaeus): Stål, 1870: 161.3; Uhler, 1872: 400; 1876: 298; Glover, 1876: 44, pl. I, fig. 21; Distant, 1881: 124.3; 1901a: 330; Lethierry & Severin, 1894: 48; Shiraki, 1913a:

120.4; Van Duzee, 1917: 88; Gibson, 1917: 72; Parshley, 1923: 747; Blatchley, 1926: 225; Deay, 1928: 377; Torre-Bueno, 1941: 50; Froeschner, 1942: 594, 599; Hussey, 1953: 32; Drew & Shaefer, 1963: 114; Allen, 1969: 100.

Anisoscelis albicincta (Say): Walker, 1871: 124.4.

General and differential diagnosis: Characteristic features of ♂♂: shape and size of genital capsule, parameres and processes 1, 9a-b and 5a. V. phyllopa is closely related to V. balteata. (For relationships between these two species see discussion on V. balteata).

Description: General characters see Blatchley, 1926: 225; Allen, 1969: 100.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with small rounded median notch and obsolete dorsal prongs; inflected part of posterior margin with two wide but low prominences (a), separated by narrow "V" shaped cleft; posterior margin slightly below the lateral margins, the latter slightly ascending posteriorly and slightly flared. Paramere (fig. C,D) - outer lobe small, rather thick, tapering and rounded apically; shank thin and elongate, without median lobe; hook long, rather narrow, broadly curved, terminating in straight, rather long rounded ventrally concave tip. Phallus (fig. E) - as in V. balteatus except process 1 with comparatively short tip and not well separated from conjunctival membrane; 2a-b less prominent; 4a-b wider; 9a-b more acute; 5a (fig. E,F) with second convolution larger.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with kidney shaped duct dilation; tubular portion of the duct long and curved.

Measurements and Ratios: (see table 53).

Geographical distribution: (Map 19) The distribution range of this species is very wide, extending over North and Central America, Antilles, northern part of South America and Brasil; the material available was collected in: U.S.A., Mexico, Jamaica and Brasil.

Habitat and Biology: The life history of V. phyllopa has been studied by Osborn (1925) and Adair (1932). This species is known as pest of: Cirsium spinosissimun elliotti (Bissell, 1929); Heliantus sp (Adams and Gaines, 1950); Mucca flacida (Bissell, 1929); Gossypium hirsutum (Morrill, 1917); Punica granatum (Lebert, 1931); Prunus persicae (Snapp, 1948); Citrus spp (Watson and Berger, 1932; Ebeling, 1959); Datura tatula (Bissell, 1929); Lycopersicum esculentum (Calvino, 1920).

Worthley (1924) reported V. phyllopa as parasited by Trichopoda pennipes Fabr. Tachinidae (Diptera); one specimen from Jamaica was found with one egg of a Tachinid, possibly of the same species, deposited on the head.

Material examined.

a) Type material: Neotype of Cimex phyllopus Linnaeus. In the XII Edition of Systems Naturae Linnaeus (1767) described phyllopus as the species No. 113 of Cimex, with reference to the material collected in

Carolina U.S.A. by D. Garden and in St. Thomas (Antilles) by L. Spengel. In the collection of Linnaeus in the University of Uppsala there is no specimen of phyllopus at all. In Linnaeus' collection of Linnean Society of London, there is one specimen simply labelled "phyllopus, 113" and this label conforms with the notation in Systema Naturae. But according to the description, the whole dorsum of C. phyllopus is uniformly brown while the specimen in the collection of the Linnean Society of London shows clearly a yellow ochre patch on declivous part of pronotum. Linnaeus described certain inconspicuous details, e.g. the presence of two thin black lines on the head and no doubt would have mentioned this conspicuous patch if it were present in his original material. Examination of the specimen showed that it represents one of the two forms of V. balteata Linnaeus, which occurs in Haiti, Dominican Republic, Puerto Rico and Brasil. The specimen and particularly the label seems to be authentic, but it is questioned if they belong to each other. According to the present curator of the collection, the type of pin used for mounting the specimen is of Linnaeus' time and "phyllopus" on the label is written in Linnaeus' hand-writing, thought the number "113" was added later. Several authors, Svenson (1945), Lindroth (1957), Cain (1958), Mayer (1969) have pointed out the unreliability of the Linnean collections, describing how the original material has been replaced by some other specimens in better condition even by Linnaeus himself; the Linnean collection of the Linnean Society of London is also known to have suffered from such changes, practiced by the first curator of the collection who apparently did not hesitate to replace one specimen by a "better" one. Lindroth (loc. cit)

suggested that "If description and authentic specimen disagree, the former is decisive", and this principle is recommended (Mayr, 1969, p. 363) and generally followed. Consequently one might conclude that the specimen in the Linnean collection of the Linnean Society of London does not represent Cimex phyllopus Linnaeus and can not be regarded as one of the syntypes; in fact it is a specimen of V. balteata to which the authentic Linnaeus label "phyllopus" was attached. Another important reason for ignoring this specimen as a valid type is the effect that it would otherwise have on the stability of the nomenclature of both V. phyllopa and V. balteata; it will cause specially serious confusion with regard to V. phyllopa whose identity based on Linnaeus' original description is well known and universally accepted and which is a common and economically important pest of various crops in North America. To avoid this confusion in the nomenclature status of both species, a suppression of the "type" specimen (female of V. balteata labelled "phyllopus, 113") in the collection of the Linnean Society is proposed, and the application to the International Commission on Zoological Nomenclature is being made to use its plenary powers (Art. 79) to annul the type, and recognize here designated neotypes of Cimex balteatus and C. phyllopus. For the neotype of Cimex phyllopus a ♂ specimen from U.S.A. Texas, Houston, 6 - XI - 1931, J. Stehlik, in BMNH collection was chosen which fully agree with Linnaeus original description.

Holotype ♀ of Anisoscelis fraterna Westwood from U.S.A., labelled "Type Hem. 328 Anisoscelis fraterna Westwood" in U.M. collection.

b) Other material: ANTILLAS: Jamaica: Kingston, 3 - VIII - 1920, C.C. Gowdey, 1 ♂ (BMNH). BRASIL: Minas Geraes, 1 ♀ (RNH); K.U. Tyduana, 1 ♂ (ZI); 1 ♂ (UZM). MEXICO: Orizaba, - XII - 1887, H.H. Smith, 1 ♂ (BMNH); Presidio, Forrer, 1 ♂ (BMNH); s.d., 1 ♀ (NR); s.d., 1 ♂ (TM); Boucard, 3 ♀ (NR); Sallé, 1 ♀ (NR); Jalisco, Guadalajara, 1903, L. Diguet, 1 ♂, 1 ♀ (MNHN); 1 ♂, 1 ♀ (MNHN); Rio Santiago, 1 ♂, 1 ♀ (MNHN); Puebla, Tehuacan, 1 ♂ (MNHN); 1 ♂, 1 ♀ (MNHN); Jalapa, 1 ♂ (RNH); Volcan Colima, 25 - VII -, 3 - X - 1918, J. Lave, 5 ♂, 8 ♀ (ZSBS); 1 ♂ (DEI); 1886, 1 ♂ (DEI); Guadalajara, 1 ♂ (DEI); Tepic, Jul., Schumann, 1 ♂ (TM); 2 ♂ (NM); II - 1883, Bilimek, 2 ♀ (NM); Orizaba, 1869, s.c., 1 ♀ (NM); 1867, Sichel, 1 ♂ (NM). U.S.A.: Alabama, 1946, Baker, 2 ♀ (TM); Alabama, Mobile, H.P. Loding, 1 ♀ (TM); Florida, St. Augustine, 4 - IV - 1901, W.J. Gerhard, 1 ♂ (TM); 25 - III - 1923, G.B. Pearson, 1 ♂ (BMNH); Texas, Houston, 6 - XI - 1931, J. Stehlik, 1 ♂ (BMNH); Florida, W.S. Blatchley, 1 ♀ (BMNH); St. John's Bluff, E. Doubleday, 2 ♂, 1 ♀ (BMNH); Texas, Atkinson, 1 ♀ (BMNH); East Florida, Ashmead, s.c., 1 ♂ (BMNH); G.B. Pearson, 1 ♂ (BMNH); Mississipi, 4 - XII - 1914, 1 ♂ (BMNH); Texas, Atkinson, 1 ♀ (BMNH); Mississipi, 5 - 18 - 1914, 1 ♂ (BMNH); Texas, Brownsville, 23 - III - 1936, J. Stehlik, 1 ♂ (BMNH); Texas, Dallas Co., 1945, J.B.M., 1 ♂ (BMNH); Texas, Nevasota, 5 - II - 1948, M. Polhemus, 1 ♀ (BMNH); s.l., 5 - IV - 1948, s.c., 1 ♂ (BMNH); Florida, Royal Palm Park, - III - 1930, W.S. Blatchley, 1 ♀ (BMNH); s.l., s.c., 1 ♂ (BMNH); Florida, Dunedin, - III - 1929, s.c., 2 ♂ (BMNH); Texas, Brazos Co., College Station, - VIII - 1965, N.L.H. Krauss, 1 ♀ (BMNH); North Carolina, Morehead City, Calico Creek, 10 - IX - 1934, J. Stehlik, 1 ♂ (BMNH); Louisiana, New Orleans, L. Becker, 1 ♀ (IRSNB);

S. Carolina, 1 ♀ (RNH); Florida, Micanopy, 13 - IV - 1924, E.G. Holt, 1 ♂ (RNH); Montana, Sarocoxie, 24 - VI - 1943, R.C. Froeschner, 1 ♂ (UZM); Texas, Houston, - IV - 1927, C. le Dous, 1 ♀ (UZM); Carolina, Germar, 1 ♀ (UZM); s.l., s.c., 1 ♂ (NR); s.l., Belfrage, 1 ♀ (NR); S. Carolina, s.c., 1 ♂ (NR); New Orleans, Deyrolle, 1 ♂, 1 ♀ (NR); Texas, Belfrage, 6 ♂, 3 ♀ (NR); s.d., 1 ♂ (ZMU); Florida, Lonnberg, 2 ♂ (NR); Florida, Tampa, 7 - V - 1937, E. Norstrand, 1 ♀ (NR); Alabama, Mobile, 28 - VIII - to 3 - IX - 1925, Bell, 1 ♂ (NR); Florida, Indian R. Dist., - VII - 1896, H.G. Barber, 1 ♂ (ZMU); Florida, St. Augustine, 28 - IV - 1901, W.J. Gerhard, 2 ♂ (ZMU); Florida, Highlands Co., Lake Placid, 6 - 8 - I - 1966, M. Meinander, 4 ♂, 2 ♀ (ZMU); Wilmington, 16 - IV - 1916, 1 ♀ (ZI); Florida, Miami, 17 - I - 1937, Zhenzhurist, 1 ♂, 1 ♀ (ZI); North Carolina, Edenton, 9 - 29 - 44 - 55, J.A. Slater, 1 ♀ (NMP); s.l., 10 - 12 - 33 - 62, s.c., 3 ♂, 3 ♀ (NMP); 1 ♀ (NM); Texas, 1873, Boll., 1 ♂ (NM); s.l., 1875, s.c., 1 ♀ (NM); Georgia, Morrison, 1 ♂, 1 ♀ (NM); s.l., 1 ♀ (NM); s.l., - I - 1877, Morrison, 5 ♂, 4 ♀ (NM); Oklahoma, 8 - V - 1949, Reinthal, 3 ♂, 3 ♀ (ZSBS); Florida, Fort Myers, Lee Co., 2 - IV - 1967, P.P. Babiy, 1 ♂, 3 ♀ (ZSBS); 2 ♂, 1 ♀ (ZSBS); Florida, Clewiston, 20 - I - 1932, A. Melander, 1 ♀ (DEI); E. Bracht, 3 ♂ (MNHU); Texas, Brazos Co., College Station, 20 - IV - 1969, R.C. Allen, 4 ♂, 6 ♀ (MNHU); Carolina, 4 ♀ (MNHU).

c) Material without data: 1 ♀, labelled "Kirkaldy Coll., (BMNH); 1 ♂, labelled "Anisoscelis albicincta, 34ld" (St. John's Bluff East Florida, from Walker, 1871, p.124.4) (BMNH); 1 ♀, 34lg (Brasil, Children's Coll., from Walker 1871, p.124.4) (BMNH); 1 ♂, labelled "phyllopus Linn.,

Distant Coll." (BMNH); 2 ♂, 2 ♀ (ZSBS); 1 ♂, 2 ♀ (ZI); 1 ♂ (MNHN); 2 ♀, labelled "A" (IRSNB); 1 ♀, labelled C. Van Voixen Coll., No. 3458 (IRSNB); 1 ♂, 1 ♀, labelled, Cat. No. 2.3 (RNH); 1 ♂ (MNHU).

Plate 52

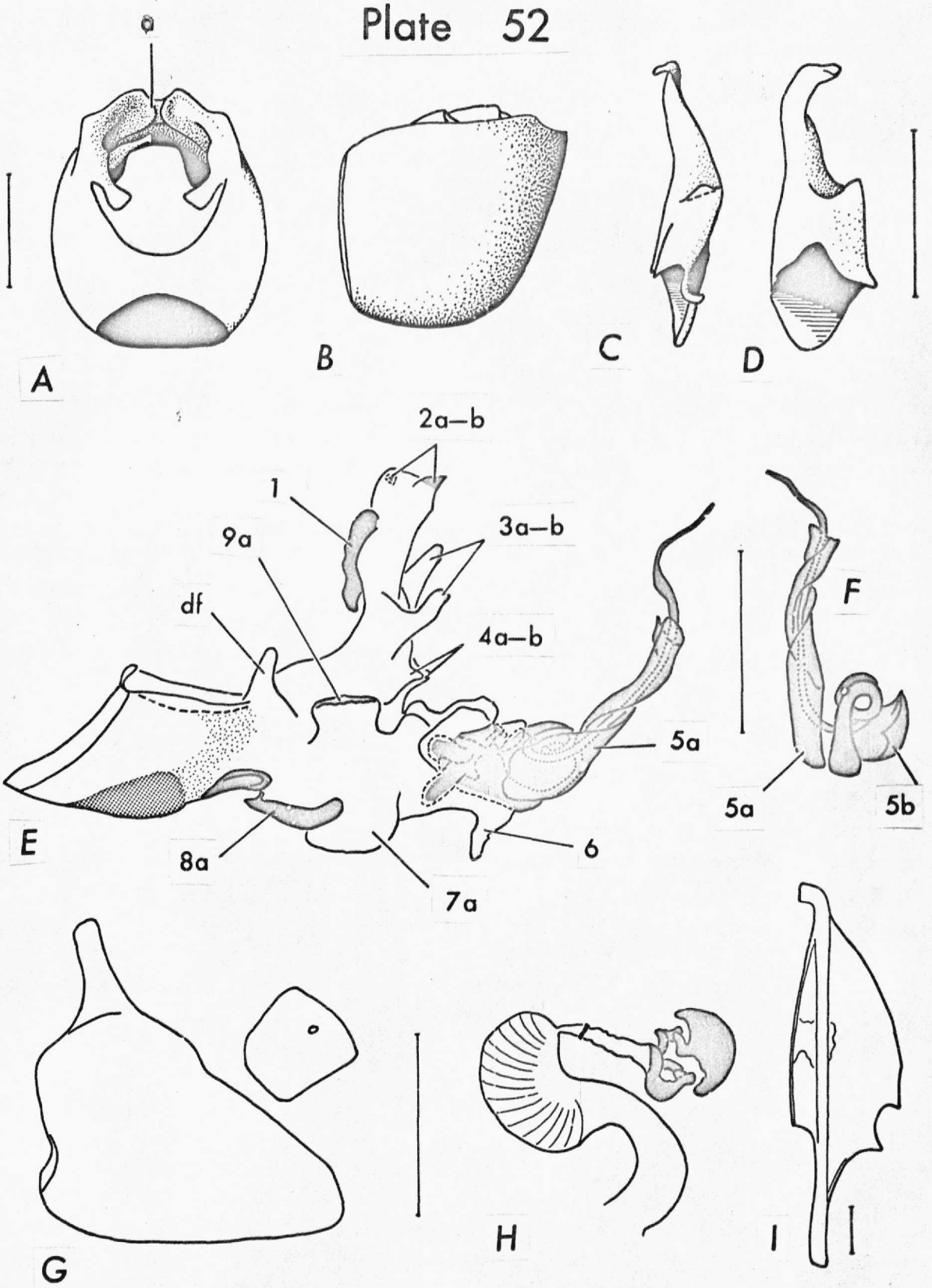


Table 53 Measurements (5 ♂♂ and 5 ♀♀ from 6 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	15.5-18.8	17.0	5	16.5-19.5	18.2
2 Head length	5	2.47-2.66	2.53	5	2.56-2.86	2.64
3 " width	5	1.90-2.14	2.03	5	2.05-2.33	2.15
Distance:						
4 inter-ocular	5	0.98-1.23	1.13	5	1.15-1.42	1.27
5 ante-ocular	5	1.17-1.38	1.27	5	1.29-1.48	1.37
Antennae:						
6 segm. I length	5	2.33-3.04	2.66	5	2.28-3.19	2.54
7 " II "	5	3.12-3.88	3.45	5	2.92-4.32	3.31
8 " III "	5	2.30-2.97	2.57	5	2.20-3.21	2.51
9 " IV "	5	3.31-3.98	3.62	4	3.16-4.56	3.56
Labium:						
10 segm. I length	5	2.09-2.56	2.24	5	2.12-2.77	2.47
11 " II "	5	1.78-2.47	2.08	5	2.01-2.56	2.32
12 " III "	5	1.02-1.33	1.14	5	1.12-1.36	1.25
13 " IV "	5	1.70-2.49	2.01	5	1.90-2.66	2.34
14 Pronotum length	5	2.92-3.98	3.46	5	3.40-4.27	3.77
15 " width	5	4.75-5.80	5.23	5	5.32-6.24	5.82
16 Scutellum length	5	1.86-2.39	2.07	5	2.07-2.54	2.30
17 " width	5	1.71-2.24	1.98	5	1.99-2.47	2.25
18 Hind tibia length	5	7.24-9.60	8.34	5	1.04-7.34	8.22
Tibial dilation:						
19 total width	5	2.35-3.16	2.75	5	2.20-3.88	2.77
external part:						
20 length	5	5.28-6.52	5.90	5	5.13-7.68	5.88
21 width	5	1.44-2.06	1.77	5	1.39-2.68	1.83
internal part:						
22 length	5	3.84-4.80	4.14	5	3.60-5.52	4.20
23 width	5	0.48-0.76	0.55	5	0.48-0.91	0.64
24 Undilated portion	5	1.58-2.30	1.83	5	1.48-2.11	1.78
Ratios: (figures refer to character numbers above).						
1 / 2	5	6.17-7.08:1	6.71:1	5	6.44-7.42:1	6.89:1
1 / 18	5	1.94-2.20:1	2.03:1	5	1.87-2.54:1	2.21:1
2 / 3	5	1.19-1.30:1	1.24:1	5	1.15-1.27:1	1.22:1
6 / 2	5	0.94-1.17:1	1.05:1	5	0.89-1.11:1	0.96:1
10 / 2	5	0.83-0.96:1	0.88:1	5	0.82-1.00:1	0.93:1
9 / 6	5	1.30-1.47:1	1.36:1	4	1.34-1.42:1	1.40:1
15 / 16	5	2.20-2.73:1	2.52:1	5	2.34-2.62:1	2.53:1
20 / 18 %	5	70.2-72.9	70.7	5	67.2-73.8	71.5
22 / 18 %	5	45.7-54.2	49.6	5	43.6-59.6	51.0

Veneza ingens Mayr, 1865 comb.n

(Plate 53)

Theognis ingens Mayr, 1865: 434. LECTOTYPE ♀ Brasil (NM) here designated [examined, dissected]

Theognis ingens Mayr: Mayr 1866: 108, fig. 26.

Leptoglossus ingens (Mayr): Stäl, 1870: 166; Lethierry & Severin, 1894: 48; Allen, 1969: 102.

Anisoscelis santaremus Walker, 1871: 129. Holotype ♀ Brasil (BMNH). [Synonymized by Allen 1969: 102, examined, dissected].

General and differential diagnosis: Characteristic features of ♂♂: shape and size of paramere, processes 3a, 9a-b and 5a. Those of ♀♀: shape of 1st gonocoxa and spermatheca.

V. ingens shows close relationships with V. macrophylla and V. balloui, sharing the following characters: shank of paramere thick with prominent median lobe, hook thick, short and blunt, not strongly curved, sclerotization of process 1 extending close to the apex of dorsal sac, processes 3a narrow and long; processes 9a-b with long, narrow and pointed anterior projection; process 5a rather thick; duct dilation of spermatheca very large, tubular portion of spermathecal duct very short and very wide. V. ingens can be distinguished from V. macrophylla dnd V. balloui by its darker colouration, comparatively long external tibial dilation, outer

lobe of paramere long and thick, tapering and apically rounded; process 3a not bifid.

Description: General characters see Alleh 1969: 102.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep, moderately wide median notch, the bottom of the latter "V" shaped; dorsal prongs prominent (a) slightly projecting mediad; the margin lateral to dorsal prongs with two small dorsally directed projections (b); inflected portion of posterior margin with two rounded prominences (c); posterior margin slightly below the lateral margins; the latter shallowly concave, slightly ascending posteriorly and slightly flared. Paramere (fig. C,D) - outer lobe long triangular and thick; shank thick with very prominent median lobe; hook thick, not strongly curved, blunt with short mĕdial subapical projection. Phallus (fig. E) - conjunctiva with long uniformly wide dorsal sac, usually with the apex slightly twisted to the left; conjunctiva armed with the following processes: 1 heavily sclerotized, stout, the sclerotization extending almost up to the apex of dorsal sac; 2a-b very prominent, membranous at base, otherwise heavily sclerotized, with long tapering pointed tip; 3a-b membranous, narrow and long, gradually tapering; 4a-b heavily sclerotized, very conspicuous, moderately separated from each other; 9a-b heavily sclerotized, very conspicuous, wide with a long slightly curved projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, ventral margin of second convolution with small rounded median projection.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular portion of the duct short wide and slightly curved.

Measurements and Ratios: (see table 54)

Geographical distribution: (Map 20) Its distribution range extends over most of South America; the material examined was collected in: Colombia, Venezuela, Surinam, French Guiana, Ecuador, Brasil and Bolivia. Allen reported it from Paraguay.

Habitat and Biology: Adults have been collected in Venezuela in August and September, in Surinam also in September and in November. During the dissections two females were found with developed eggs, one from Ecuador collected in May and the other with no data at all; the eggs are subcylindrical with one side flat, length = 1.48mm, width = 1.23mm, height = 0.87mm. One specimen from Venezuela (Mónagas) was found with one egg of a Tachinid (Diptera), possibly Trichopoda pennipes Fabr., deposited on the scutellum.

Discussion: This species shows considerable variation in the colour pattern, which varies from black to dark reddish brown, may have the declivous area of pronotum yellow, or may or may not have a transverse irregular patch on corium. The general colouration of the body appears to vary individually because specimens entirely black and soecimens with pronotum yellow were collected in the same locality and simultaneously in Venezuela, Monagas; the same is observed in the lectotype and

paralectotype of Theognis ingens, the first is almost entirely black and the other with the pronotum yellow ochre, and presumably both come from the same locality. The variation of the transverse patch on corium according to Allen 1969 is of geographic origin, I only saw four specimens without the patch on corium and only one of those with detailed locality.

Material examined

a) Type material: Theognis ingens Mayr, 2 ♀♀ syntypes: both labelled "Brasil, Schott, ingens det. Mayr" the specimen with pronotum unicolourus was designated as Lectotype and accordingly labelled, and the specimen with bicolourus pronotum as paralectotype, in NM collection.

Holotype ♀ of Anissocelis santarem Walker, from Brasil, Santarem, labelled "Type, 23, Anissocelis santarema, 52.96" in BMNH collection.

b) Other material: BOLIVIA: Yungas de La Paz, 1000m. H. Rolle, 1 ♂ (DEI); 1 ♀ (DEI); Yungas de La Paz, 1000m. O. Garlepp.S., 3 ♂ (MNHU); 1 ♀ (NMP); 1 ♂ (TM); Juntus, 1 ♀ (NR). BRASIL: Sao Paulo, 1 ♀ (BMNH); Minas Geraes, Passa Quatro, 915m, 13 - XII - 1922, J. Zikan, 1 ♀ (MNHU); Lagoa Santa, Reinh, 1 ♀ (UZM); Amazonas sup. Olivenca, 1 ♂, 2 ♀ (NR); Taperinha, Santarem, G. Hagmann, 1 ♀ (NM). COLOMBIA: Bogotá, 1862, 1 ♂ (MNHN). ECUADOR: Rosenberg, 1 o, 1 ♀ (BMNH); Ambato, 1898, 1 o, 2 ♀ (MNHN); Montagne du Chaud Nanegal, rio Gallabomba, 1901, G. Rivet, 1 ♂, 1 ♀ (MNHN); Tungurahua, Banos, 1830m, 1911, J. Bourgeouis, 3 ♂, 2 ♀ (MNHN); Macas, 1 ♀ (TM); Balzapamba, R. Hansch, 1 ♀ (TM). FRENCH GUIANA: 1899, R. Oberthur, 1 ♂, 1 ♀ (MNHN); Cayenne, 1 ♀ (NM). SURINAM: Paramaribo,

27 - IX - 1959, P.H.v. Doesburg Jr., 1 ♂ (RNH); s.l., - XI - 1962, s.c., 1 ♂ (RNH). VENEZUELA:1895, G. Fallou, 1 ♂ (MNHN); Monagas: Jusepín, 8 - VIII - 1956, Fermández Yepez, C.J. Rosales, 4 ♂ (IZA); s.l., 14 - IX - 1965, 2 ♀ (IZA); s.l., 22 - IX - 1963, 1 ♀ (IZA).

c) Material without data: 1 ♂ labelled "No. 4252" (IRSNB); 1 ♂, 1 ♀, labelled "America, Calkoen" (RNH); 1 ♀ (ZI); 1 ♀ labelled "Fry Coll. 1905.100, 287" (BMNH); 1 ♀ (MNHU).

Plate 53

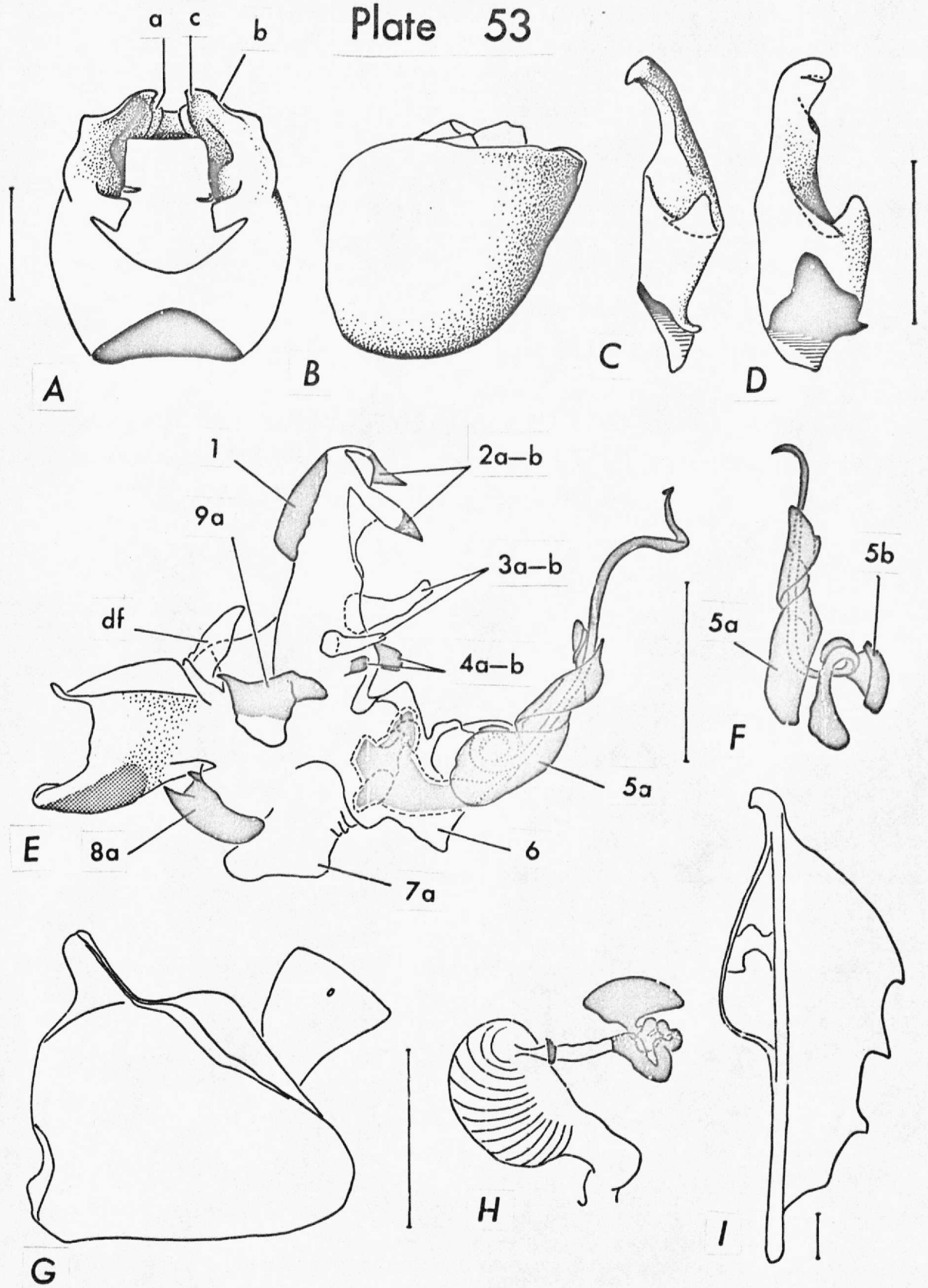


Table 54 Measurements (5 ♂♂ and 3 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	18.2–20.0	19.3	3	20.5–21.5	21.0
2 Head length	5	3.04–3.30	3.17	3	3.04–3.32	3.16
3 " width	5	2.28–2.43	2.38	3	2.47–2.54	2.51
Distance:						
4 inter-ocular	5	1.17–1.38	1.26	3	1.36–1.44	1.39
5 ante-ocular	5	1.52–1.55	1.53	3	1.53–1.67	1.60
Antennae:						
6 segm. I length	5	3.04–3.51	3.18	3	2.94–3.15	3.04
7 " II "	5	4.17–4.80	4.35	3	4.08–4.32	4.24
8 " III "	5	2.88–3.36	3.06	2	2.97–3.12	3.04
9 " IV "	4	5.56–6.24	5.92	2	5.66–6.00	5.83
Labium:						
10 segm. I length	5	2.85–3.14	3.01	3	2.94–3.23	3.13
11 " II "	5	2.66–3.07	2.95	3	2.92–3.23	3.08
12 " III "	5	1.48–1.63	1.56	3	1.53–1.72	1.65
13 " IV "	5	3.00–3.51	3.34	3	3.04–3.55	3.27
14 Pronotum length	5	3.45–4.17	3.82	3	3.93–3.98	3.96
15 " width	5	6.76–7.34	6.83	3	6.96–8.20	7.46
16 Scutellum length	5	2.47–2.66	2.49	3	2.49–2.58	2.55
17 " width	5	2.28–2.56	2.45	3	2.66–2.85	2.72
18 Hind tibia length	5	9.90–11.2	10.4	2	10.1–10.5	10.3
Tibial dilation:						
19 total width	5	3.55–3.88	3.77	2	3.60–3.93	3.76
external part:						
20 length	5	7.68–9.31	8.48	2	7.92–8.54	8.23
21 width	5	2.25–2.59	2.33	2	2.44–2.64	2.54
internal part:						
22 length	5	4.32–4.80	4.60	2	4.17–4.80	4.48
23 width	5	0.96–1.00	1.00	2	1.20–1.25	1.22
24 Undilated portion	5	1.10–1.44	1.17	2	1.10–1.10	1.10
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.84–6.57:1	6.08:1	3	6.47–6.90:1	6.64:1
1 / 18	5	1.78–1.96:1	1.85:1	2	2.02–2.04:1	2.03:1
2 / 3	5	1.25–1.36:1	1.33:1	3	1.19–1.31:1	1.25:1
6 / 2	5	0.93–1.08:1	1.00:1	3	0.93–1.00:1	0.96:1
10 / 2	5	0.86–1.03:1	0.94:1	3	0.93–1.06:1	0.99:1
9 / 6	4	1.77–2.00:1	1.86:1	2	1.90–1.92:1	1.91:1
15 / 16	5	2.54–3.15:1	2.74:1	3	2.79–3.17:1	2.92:1
20 / 18 %	5	77.3–84.7	81.5	2	78.4–81.3	79.9
22 / 18 %	5	41.5–47.0	44.2	2	41.2–45.7	43.4

Veneza macrophylla Stål, 1870 comb.n

(Plate 54)

Leptoglossus macrophyllus Stål, 1870: 162. Lectotype ♂ Colombia (NR) designated by Allen, 1969: 104. [examined].

Leptoglossus macrophyllus Stål: Bethierry & Severin, 1894: 48; Allen, 1969: 104.

General and differential diagnosis: Transverse rectangular yellowish white patch on pronotum. Characteristic features of ♂♂: shape and size of paramere, processes 9a-b and 5a. Those of ♀♀: shape of 1st gonocoxa and spermatheca.

V. macrophylla shows close relationship with V. ingens and V. balloui. It can be distinguished from any species of the genus by the patch on pronotum.

Description: General characters see Allen, 1969: 104.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep moderate to narrow "U" shaped median notch, sometimes the bottom of the notch "V" shaped; dorsal prong (a) acute, projecting dorsally and slightly curved inward; the margin lateral to dorsal prongs with small dorsally directed projection (b); inflected portion of posterior margin with two wide rounded prominences (c) separated by a narrow cleft;

posterior margin slightly below lateral margins; the latter gradually ascending posteriorly, barely flared. Paramere (fig. C,D) - outer lobe small, subtriangular, acute and narrow; shank thick with very prominent wide and dorsally curved median lobe; hook thick, not strongly curved, blunt with very small medial apical projection. Phallus (fig. E) - conjunctiva with long uniformly wide dorsal sac, usually with the apex slightly twisted to the left; conjunctiva armed with the following processes: 1 heavily sclerotized, stout, its sclerotization extending almost up to the apex of dorsal sac; 2a-b heavily sclerotized with membranous base, very conspicuous with long tapering tip, 2a skewed; 3a-b membranous, narrow and long, 3b longer than 3a, the latter terminating in two small lobiform tips; 4a-b heavily sclerotized, very conspicuous, moderately separated; 9a-b heavily sclerotized, very conspicuous, wide, with long straight gently tapering anterior projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, ventral margin of second convolution curved.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of the duct short straight with wide base.

Measurements and Ratios: (see table 55)

Geographical distribution: (Map 20) Only known from Venezuela, Colombia and Guatemala.

Material examined

a) Type material: Lectotype ♂ of Leptoglossus macrophyllus Stal, from Colombia, Bogotá, labelled "Allotypus, Leptoglossus macrophyllus Stal, Bogotá, Lindig, 334"67", in NR collection. Paralectotype ♀ labelled "Typus, 333/67, the rest as in the lectotype" in NR collection.

b) Other material: COLOMBIA: Bogota, 1862, 1 ♀ (MNHN); s.l., 1911, 1 ♂ (BMNH); Sta. Marta, 1853, M. Fontanier, 1 ♀ (MNHN); Bogotá, 1 ♂ (MNHN); s.l., Felchor, 1 ♂ (RNH); Aguatal, 3 ♂ (RNH); Sosomoco, 1 ♂ (RNH); San Antonio, 1 ♀ (RNH); 1873, Nulken, 2 ♀ (NM); Villa Vicencio, 1919, 1 ♀ (DEI); San Antonio, 2000m, 1 ♂ (DEI); 1 ♂, 2 ♀ (MNHU). GUATEMALA: 1 ♀ (NMP). VENEZUELA: Aragua: Rancho Grande 1100m, 22 - X - 1952, F. Fernandez Yepez, 1 ♂ (IZA); s.l., 25 - VIII - 1955, F. Fernández Yepez, C.J. Rosales, 1 ♂ (IZA); Lara: Terepaima near Cabudare 1400m, 1 ♂ 4 - XI - 1956, F. Fernandez Yépez, C.J. Rosales, 1 ♀ (IZA); s.l., 4 - I - 1954, F. Fernandez Yépez, C.J. Rosales, 1 ♂ (IZA); Trujillo: near Escuque, 7 - VII - 1958, N. Angeles, C.J. Rosales, 1 ♀ (IZA); La Cabrera near Duri, 22 - IX - 1954, 1 ♂ (IZA); near La Puerta, 12 - II - 1953, 1 ♀ (IZA); Dist. Federal, El Valle, 23 - V - 1950, A. Hernandez, 1 ♂ (IZA); s.l., 23 - VI - 1942, R. Araque, 1 ♀ (IZA); 1895, G. Fallou, 1 ♀ (MNHN); Mérida: 1 ♂ (RNH); 2 ♀ (NR); 8 - 10 - IV, 12 - VI, 18 - VIII - 1965, 2 ♂, 2 ♀ (ZSBS); 1 ♀ (DEI); Zulia: Maracaibo, Wilrke, 1 ♂ (UZM); Dist. Federal: Caracas, Meinerl, 1 ♀ (UZM); 1 ♀ (NM); 2 ♀ (NM); Pico Avila, 8 - X - 1950, P. Volg, 1 ♂, 1 ♀ (ZSBS).

Plate 54

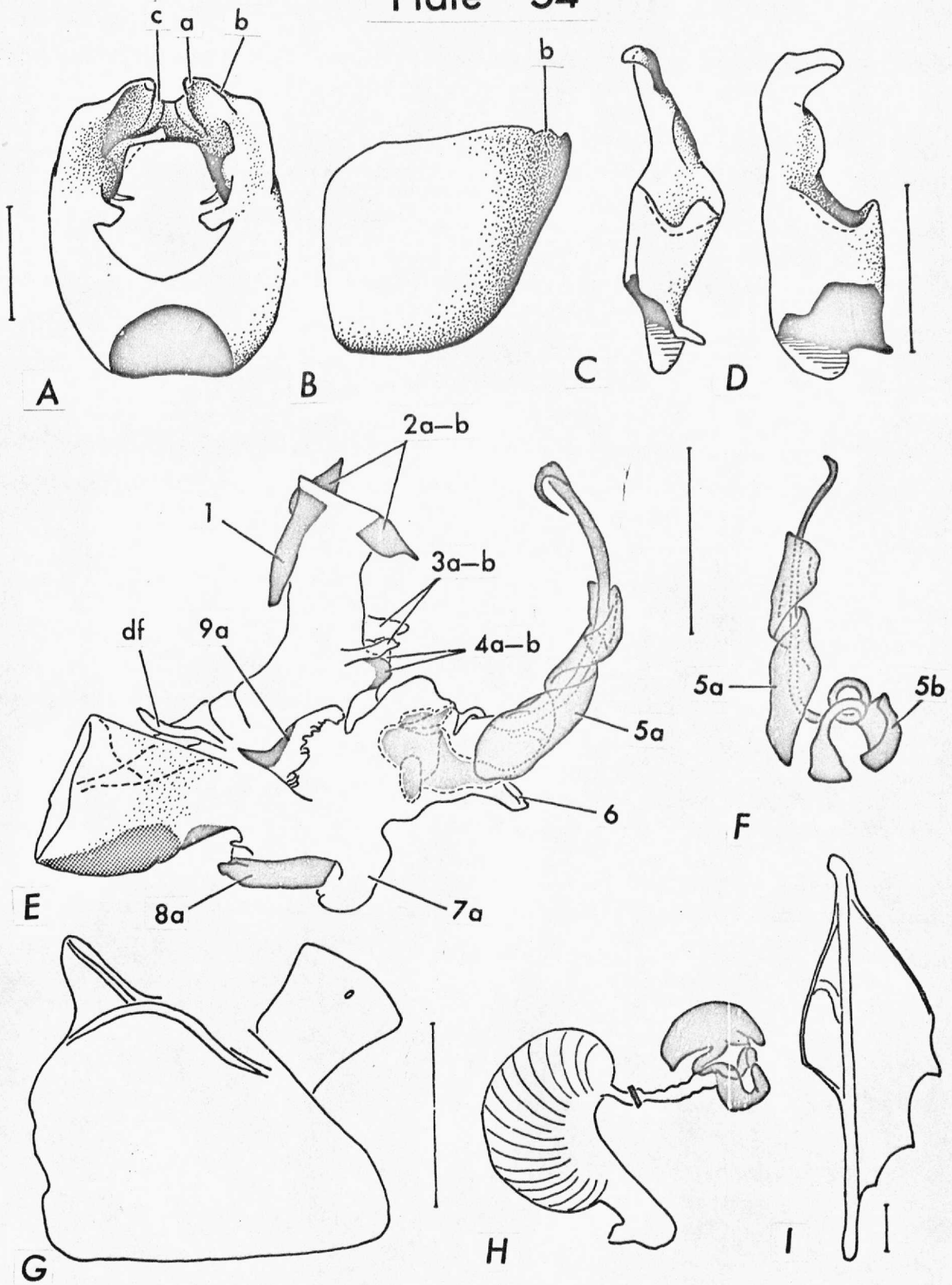


Table 55 Measurements (4 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	16.0–20.0	18.0	5	15.0–21.3	18.8
2 Head length	4	2.66–3.04	2.82	5	2.39–3.17	2.89
3 " width	4	2.05–2.35	2.24	5	2.09–2.54	2.35
Distance:						
4 inter-ocular	4	1.08–1.33	1.19	5	1.10–1.36	1.23
5 ante-ocular	4	1.33–1.55	1.39	5	1.19–1.52	1.41
Antennae:						
6 segm. I length	4	2.39–2.85	2.64	5	2.09–2.66	2.43
7 " II "	4	3.36–4.27	3.75	5	3.02–4.17	3.70
8 " III "	4	2.40–2.83	2.65	5	2.40–3.16	2.72
9 " IV "	4	4.17–5.28	4.85	5	3.93–5.42	4.69
Labium:						
10 segm. I length	4	2.37–3.04	2.58	5	2.22–2.94	2.66
11 " II "	4	2.28–2.90	2.49	5	2.28–2.81	2.53
12 " III "	3	1.19–1.53	1.33	5	1.23–1.57	1.37
13 " IV "	3	2.47–3.06	2.69	5	2.37–3.25	2.66
14 Pronotum length	4	2.88–3.93	3.50	5	2.44–4.56	3.61
15 " width	4	4.80–7.00	5.90	5	4.70–8.01	6.36
16 Scutellum length	4	1.90–2.37	2.15	5	1.74–2.69	2.47
17 " width	4	1.86–2.33	2.18	5	1.88–2.85	2.39
18 Hind tibia length	4	7.48–9.60	8.55	5	6.81–10.3	8.51
Tibial dilation:						
19 total width	4	2.16–3.69	2.97	5	2.40–3.64	2.93
external part:						
20 length	4	5.28–7.68	6.52	5	4.80–7.68	6.25
21 width	4	1.34–2.40	1.88	5	1.44–2.30	1.81
internal part:						
22 length	4	2.64–4.08	3.48	5	3.12–4.80	3.93
23 width	4	0.52–0.96	0.79	5	0.84–1.63	1.21
24 Undilated portion	4	1.34–1.63	1.43	5	0.96–1.63	1.34
Ratios: (figures refer to character numbers above).						
1 / 2	3	5.81–6.57:1	6.25:1	5	6.25–6.71:1	6.50:1
1 / 18	3	2.00–2.13:1	2.07:1	5	2.06–2.35:1	2.20:1
2 / 3	4	1.18–1.34:1	1.25:1	5	1.14–1.28:1	1.22:1
6 / 2	4	0.86–1.00:1	0.93:1	5	0.75–0.87:1	0.84:1
10 / 2	4	0.83–1.00:1	0.91:1	5	0.88–1.03:1	0.92:1
9 / 6	4	1.74–1.94:1	1.83:1	5	1.80–2.01:1	1.93:1
15 / 16	4	2.52–2.95:1	2.74:1	5	2.62–2.97:1	2.57:1
20 / 18 %	4	70.5–85.6	76.2	5	70.4–77.4	73.4
22 / 18 %	4	35.2–42.8	40.7	5	45.8–47.6	46.1

Veneza balloui sp.n

(Plate 55)

General and differential diagnosis: Colour pattern of pronotum, scutellum and corium. Characteristic features of ♂♂: condition of dorsal prongs, shape and size of paramere and processes 2a, 9a-b and 5a. Those of ♀♀: shape and size of Ist gonocoxa and spermatheca.

V. balloui is closely related to V. ingens and V. macrophylla. For differences see differential diagnosis of these species.

Description: Head. Basically black; with a median longitudinal narrow band extending from apex of tylus to the depression behind ocelli, two stripes behind and lateral to the latter, an irregular patch on bases of antenniferous tubercles and an irregular band extending from buccula to the neck, pale reddish brown. Anterior and posterior surfaces of all labial segments black, lateral surfaces dark yellow ochre to pale reddish brown, tip of the IVth segment black. Ist antennal segment black, with anterior surface dark yellow ochre; segments II and III dark yellow ochre with the distal portion black; IVth segment yellowish white to yellow ochre with black base. Tylus blunt, usually slightly but occasionally not projecting anteriorly; slightly or well elevated above juga ; the latter somewhat bulging, rounded anteriorly, with straight median and convex lateral margin. Labium not reaching beyond the middle

IVth sternite. Thorax. Central area of pronotum, usually central area of scutellum and the corium dull dark red; calli, submarginal lateral area of the anterior half of pronotum, posterior half of lateral margins, humeral areas and angles, and posterior margin of pronotum dull black; base and lateral margins of scutellum, dull black; corium with costal margin, claval suture, posterior margin of clavus and some areas at base dull black, and with a wide yellowish white patch extending transversely over almost the whole width of corium. Pleural region reddish tan to reddish brown with numerous black spots, occasionally fused together and forming irregular patches. Pro and mesosternum black, the latter with a median reddish tan to reddish brown band; metasternum reddish tan to reddish brown. Coxa and trochanter reddish tan to reddish brown with black patches and spots, coxa occasionally basically cinnamon; femur tibia and tarsus of all legs reddish brown; fore femur with distal half black, extending beyond the middle of the femur on the internal surface; middle and hind femur with distal half black except the anterior surface; posterior surface of hind tibial dilation dark brown to black with an irregular white patch on internal dilation, and a small one on the external dilation; anterior surface reddish brown, irregularly dotted with minute black spots. Pronotal calli elevated, the median anterior part higher with two small tubercles; pronotum abruptly declivent with minute and scattered punctations; without median carina; lateral margins curved; humeral areas broad, horizontal and laterally projected, slightly below the level of dorsal part of the disk; humeral angles obtuse and slightly ascending; postero-lateral margin with fine serrations; posterior

margin deeply depressed and concave. Hind tibia (fig. I) external dilation foliaceous with two deep emarginations and extending over 70.0 to 79.6% (77.1%) of the length of tibia. Abdomen. Tergites black, connexivum dark brown. Sternites, Ist gonocoxa and laterotergite in females and genital capsule in males reddish tan to reddish brown, both with numerous black spots which occasionally are fused together forming irregular patches.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with very wide and deep rounded notch; dorsal prongs (a) rudimentary; the margin lateral to the latter with rounded dorsally directed projection (b); inflected portion of posterior margin with two wide round prominences (d) separated by a wide quadrangular cleft; posterior margin slightly below the lateral margins; the latter gradually ascending posteriorly and flared. Paramere (fig. C,D) - outer lobe small, subtriangular, rounded and rather thick; shank thick with prominent median lobe but basally not differentiated from the shank; hook very thick, blunt with large and fine medial apical projection. Phallus (fig. E) - conjunctiva with long, uniformly wide dorsal sac, with the apex twisted to the left; conjunctiva armed with the following processes: 1 heavily sclerotized, wide, long and appressed, its sclerotization extending almost up to the apex of dorsal sac; 2a-b heavily sclerotized, with long tapering tip, 2b very conspicuous with a long membranous base and 2a shorter; 3a-b membranous, narrow and long, 3b longer than 3a, the latter terminating in two small lobiform tips; 4a-b moderately sclerotized, very conspicuous, at moderate distance from each other; 9a-b heavily sclerotized, very conspicuous,

wide with long, narrow, slightly curved anterior projection; 8a-b heavily sclerotized; 6a and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, ventral margin of second convolution slightly sinuate and wide.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of duct long and very wide.

Measurements and Ratios: (see table 56)

Geographical distribution: (Map 20) Only known from Central America, in Costa Rica and Panama.

Material examined

a) Type material: Holotype ♂ of Veneza balloui, from Costa Rica, Sanatorio Duran, 2.333m, 19 - XI - 1933, S.H. Ballou on apple, in IZA collection.

Paratypes: COSTA RICA: Orosi, 1 ♂ (RNH); Irazu, 6 - 7000 ft., H.Rogers, 1 ♀ (BMNH); San Jose. 1161 m, P.Bielley, 1 ♀ (BMNH). PANAMA: Volcan de Chirigui 600-900 m, Champion, 1 ♂. 3 ♀ (BMNH); S.1., 1200-1800, s.c. 1 ♂ (BMNH); s.d. 1 ♂, 1♀ (ZI).

Plate 55

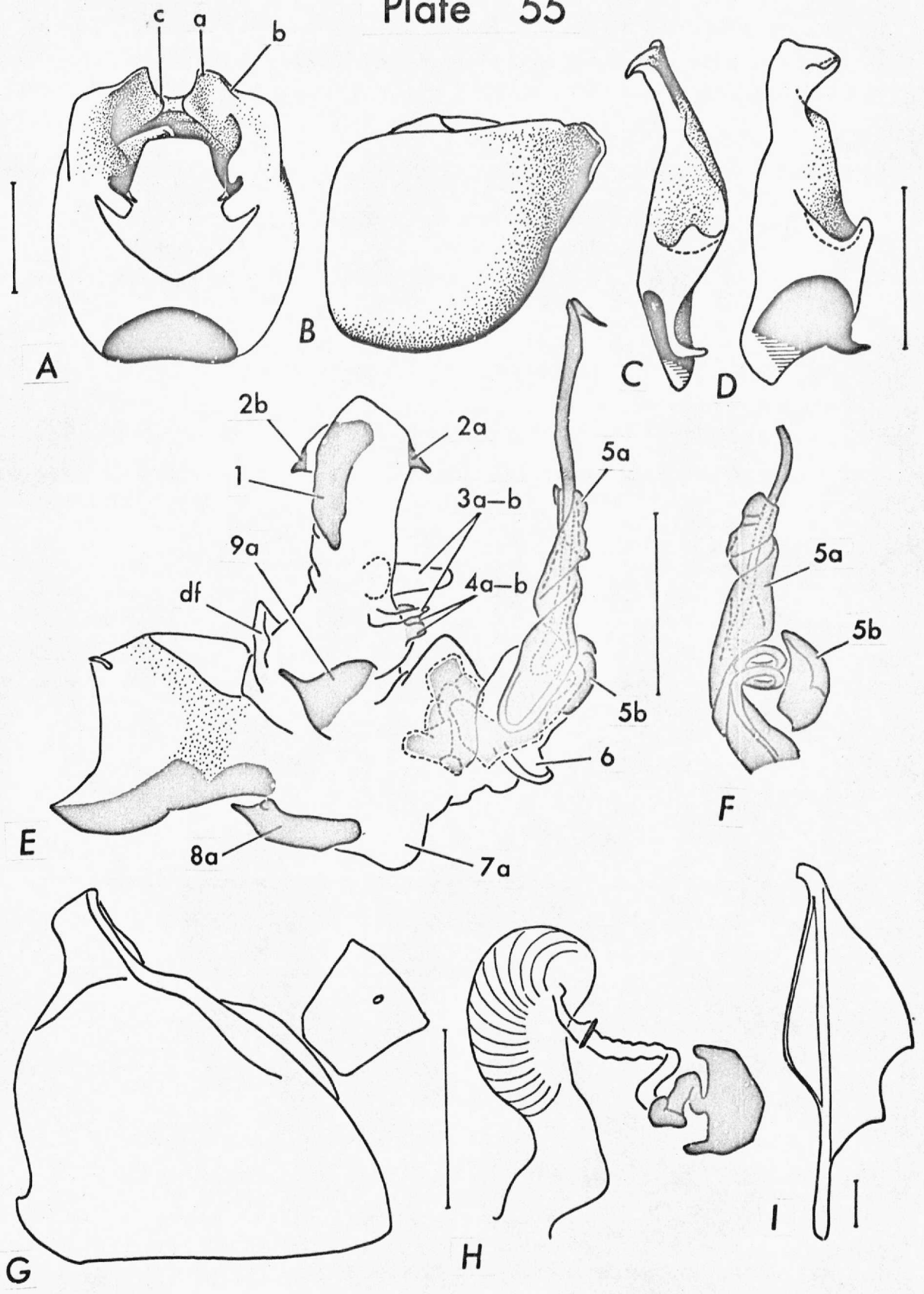


Table 56 Measurements (4 ♂♂ and 4 ♀♀ from 7 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	17.0–18.5	17.8	4	18.0–20.5	19.6
2 Head length	4	2.80–3.02	2.88	4	2.86–3.32	3.08
3 " width	4	2.22–2.33	2.27	4	2.29–2.49	2.40
Distance:						
4 inter-ocular	4	1.14–1.23	1.20	4	1.25–1.36	1.30
5 ante-ocular	4	1.36–1.50	1.44	4	1.53–1.55	1.53
Antennae:						
6 segm. I length	4	2.47–2.75	2.61	4	2.33–2.85	2.62
7 " II "	4	3.74–4.12	3.89	4	3.50–4.32	3.92
8 " III "	4	2.66–3.07	2.90	3	2.54–3.12	2.89
9 " IV "	4	4.32–4.65	4.52	2	4.80–4.84	4.82
Labium:						
10 segm. I length	4	2.56–2.85	2.74	4	2.81–3.23	3.07
11 " II "	4	2.66–2.71	2.67	4	2.71–3.13	2.93
12 " III "	4	1.52–1.61	1.55	4	1.55–1.71	1.67
13 " IV "	4	2.81–3.04	2.92	4	3.06–3.26	3.16
14 Pronotum length	4	3.07–3.55	3.23	4	3.60–3.93	3.69
15 " width	4	5.42–6.38	5.96	3	6.24–7.44	6.83
16 Scutellum length	4	2.09–2.14	2.11	3	2.45–2.67	2.56
17 " width	4	2.26–2.33	2.29	3	2.09–2.85	2.59
18 Hind tibia length	4	8.01–9.36	8.51	2	9.02–9.88	9.45
Tibial dilation:						
19 total width	4	2.01–3.02	2.61	2	3.16–3.84	3.50
external part:						
20 length	4	5.61–6.72	6.07	2	6.72–7.87	7.29
21 width	4	1.29–1.92	1.65	2	2.01–2.49	2.25
internal part:						
22 length	4	3.60–4.32	3.93	2	4.56–4.80	4.68
23 width	4	0.62–0.80	0.72	2	0.84–1.10	0.97
24 Undilated portion	4	1.44–1.72	1.54	2	1.29–1.53	1.41
Ratios: (figures refer to character numbers above).						
1 / 2	4	6.07–6.38:1	6.18:1	4	6.02–6.57:1	6.36:1
1 / 18	4	1.96–2.18:1	2.09:1	2	2.07–2.21:1	2.14:1
2 / 3	4	1.25–1.29:1	1.26:1	4	1.21–1.33:1	1.28:1
6 / 2	4	0.88–0.93:1	0.90:1	4	0.80–0.91:1	0.85:1
10 / 2	4	0.88–1.00:1	0.95:1	4	0.92–1.03:1	0.99:1
9 / 6	4	1.65–1.81:1	1.73:1	2	1.68–1.81:1	1.84:1
15 / 16	4	2.55–2.98:1	2.82:1	3	2.54–2.90:1	2.66:1
20 / 18 %	4	70.0–72.4	71.3	2	74.5–79.6	77.1
22 / 18 %	4	44.1–49.4	46.1	2	48.5–50.5	49.5

Veneza conspersa Stål 1870 comb.n

(Plate 56)

[Theognis vexillatus Stål; Mayr, 1866: 101. Misidentification]

Leptoglossus conspersus Stål, 187): 163. Lectotype ♂, Colombia (RN), designated by Allen, 1969, 106 [examined].

Leptoglossus conspersus Stål: Lethierry & Severin, 1894: 47; Allen, 1969: 106.

General and differential diagnosis: Usually large pronotal patches, extending over most of the disk. Characteristic features of ♂♂: dorsal sac tapering and distally elongate. Those of ♀♀: shape and size of Ist gonocoxa.

V. conspersa shows close relationships with V. zonata, V. opposita and particularly with V. aucta, sharing with them the following characters: hook of paramere strongly curved and tapering distally; process 3a with additional proximal lobe; IInd convolution of process 5a large and uniform. With V. aucta it also shares similar dorsal prongs, hook of paramere, processes 9a-b and the condition of spermatheca. V. conspersa can be distinguished from the above three species by the colour pattern of the pronotum, and the condition of distal portion of dorsal sac.

Description: General characters see Allen, 1969: 106.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep and wide rounded to subquadrangular notch; dorsal prongs acute (a) strongly projecting postero-dorsally; the margin lateral to dorsal prongs slightly curved (b); inflected portion of posterior margin with a pair of small lateral prominences (c) separated from each other by shallow concave depression; posterior margin below the lateral margin; the latter gradually ascending posteriorly and slightly flared. Paramere (fig. C,D) - outer lobe large, thick and acute; shank thick with prominent median lobe well marked dorsally but curving towards the base of the shank; hook thick and curved, tapering distally with small medial apical projection. Phallus (fig. E): conjunctiva with long tapering dorsal sac, and armed with the following processes: 1, heavily sclerotized, wide, long and approssed, at some distance from the apex of dorsal sac; 2a-b moderately sclerotized, sessile, pointed; 2b smaller and less pointed than 2a; 3a-b membranous, elongate and very conspicuous, 3b tapering distally and 3a with an additional ventro-proximal lobe (d); 4a-b moderately sclerotized, very conspicuous, wide and joined medially, 4b longer than 4a; 9a-b heavily sclerotized, very conspicuous, wide, with wide and flat anterior projection, the tip of the latter truncate, sometimes wider than middle part; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, with second convolution large and uniformly wide.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped to ovoidal duct dilation; tubular part of the duct long widening near the base.

Measurements and Ratios: (see table 57)

Geographical distribution: (Map 21) Only known from Colombia, Venezuela and Brasil.

Discussion: Allen's description of the genitalis does not represent the usual condition in V. conspersa; his description was based on a male specimen from Brasil, Minas Geraes which according to him has both the right and left median lobes (= processes 3a-b) bifid; I have dissected three males from Venezuela in which the process 3b (left median lobe of Allen) was single (see fig. E). Examination of the genitalia dissected by Allen showed that it was only partially everted, and after redissection I found that this specimen shows the same condition of the process 3b as the specimens from Venezuela. In addition, Allen's specimen from Brasil also shows the posterior margin of genital capsule more projected posteriorly, dorsal prongs considerably longer, tibial dilation with rather shallow emarginations, and the spots on pleural region are slightly larger and more isolated. This specimen is provisionally identified as V. conspersa but further material is necessary to clarify its actual status. Other variations observed in the material include a female from Venezuela Aragua Rancho Grande, which has the tibial dilation with four emarginations.

Material examined

a) Type material: Lectotype ♂ of Leptoglossus conspersus Stål, from Colombia, Bogotá, labelled "Typus, Colombia, Bogota, Lindig" in NR collection. Syntypes: 3 ♀♀ with the same data as the lectotype, 2 labelled

as "paratypus" and one as "allotypus" in NR collection.

b) Other material: BRASIL: Minas Geraes 1 ♂ (NR). VENEZUELA: Carabobo: Hda. El Diamante carretera Central Tacarigua - Los Naranjos Km 14, 900m, 12 - I - 1966, F. Fernández Yépez, C.J. Rosales, 3 ♂, 2 ♀ (IZA); Naguanagua, 480m, 7 - VII - 1966, M. Sierra, 1 ♀ (IZA); Aragua: Rancho Grande, 26 - V - 1951, F. Fernandez Yepez, 1 ♀ (IZA).

Plate 56

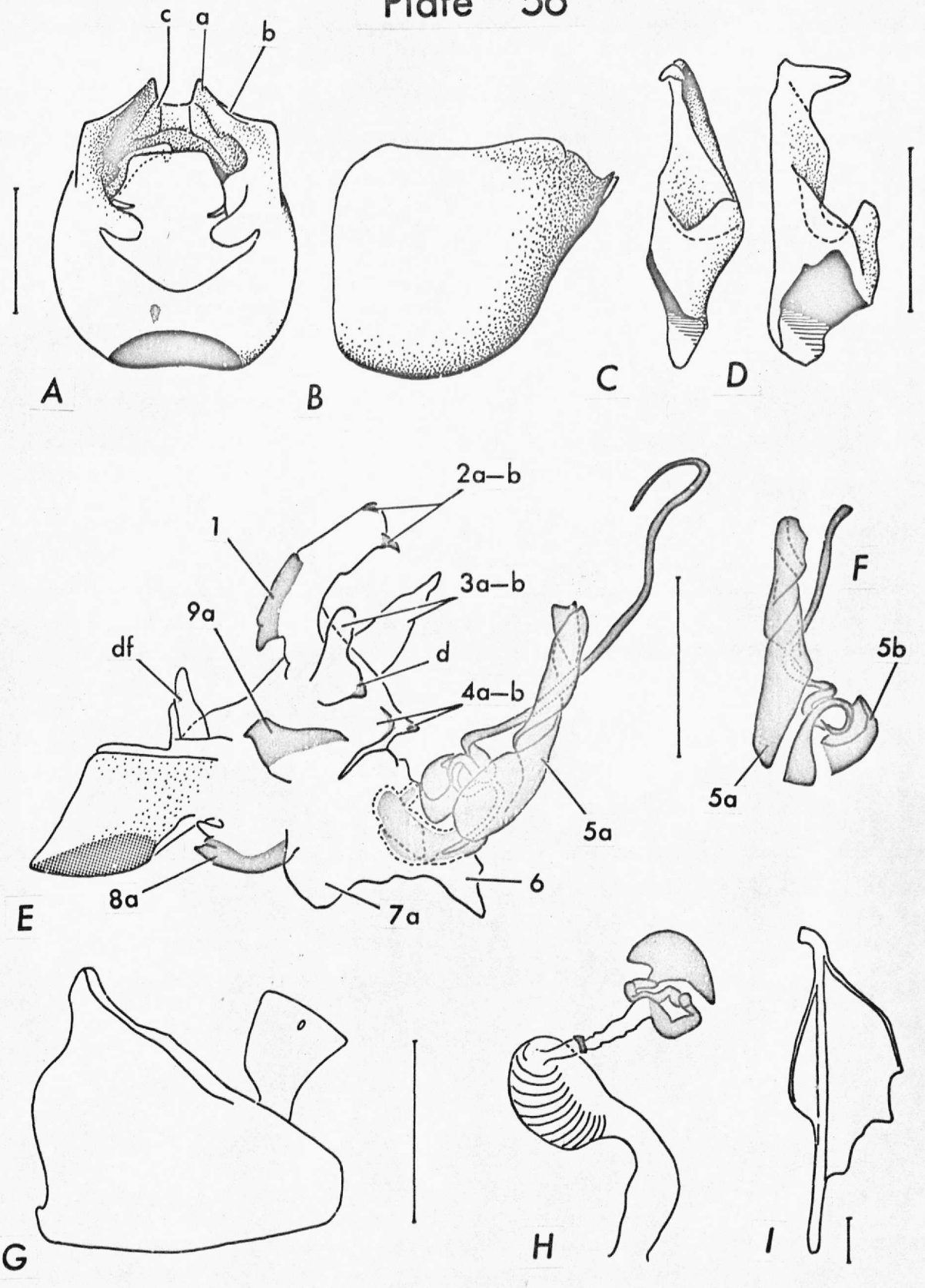


Table 57 Measurements (4 ♂♂ and 4 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	14.0–18.0	16.5	4	17.3–20.0	18.2
2 Head length	4	2.37–2.88	2.72	4	2.66–3.04	2.84
3 " width	4	1.91–2.31	2.16	4	2.10–2.45	2.27
Distance:						
4 inter-ocular	4	1.04–1.27	1.14	4	1.15–1.27	1.20
5 ante-ocular	4	1.10–1.31	1.24	4	1.29–1.50	1.35
Antennae:						
6 segm. I length	3	2.26–3.11	2.70	4	2.28–3.07	2.58
7 " II "	3	3.02–3.98	3.56	4	3.12–4.03	3.49
8 " III "	3	2.20–2.92	2.58	4	2.40–3.07	2.62
9 " IV "	3	4.32–5.32	4.94	3	3.56–5.47	4.61
Labium:						
10 segm. I length	4	2.09–2.58	2.34	4	2.10–2.73	2.37
11 " II "	4	1.99–2.41	2.21	4	1.99–2.68	2.23
12 " III "	4	1.00–1.17	1.09	4	0.98–1.36	1.13
13 " IV "	4	1.84–2.37	2.12	4	1.95–2.56	2.16
14 Pronotum length	4	2.68–3.60	3.28	4	3.12–4.03	3.57
15 " width	4	4.22–5.66	5.22	4	5.18–6.29	5.74
16 Scutellum length	4	1.76–2.31	2.11	4	2.09–2.49	2.26
17 " width	4	1.80–2.24	2.09	4	2.05–2.39	2.27
18 Hind tibia length	3	7.63–9.40	8.73	4	7.77–10.3	8.58
Tibial dilation:						
19 total width	3	2.64–3.40	3.13	4	3.16–3.74	3.42
external part:						
20 length	3	5.28–5.80	5.61	4	5.47–7.20	6.02
21 width	3	1.72–2.30	2.06	4	1.96–2.49	2.20
internal part:						
22 length	3	3.36–4.32	3.93	4	3.50–4.80	4.23
23 width	3	0.56–0.84	0.72	4	0.91–1.00	0.96
24 Undilated portion	3	1.68–2.54	2.20	4	1.68–2.40	1.90
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.82–6.25:1	6.06:1	4	5.88–6.61:1	6.40:1
1 / 18	3	1.81–1.85:1	1.89:1	4	1.94–2.34:1	2.12:1
2 / 3	4	1.23–1.31:1	1.25:1	4	1.20–1.28:1	1.25:1
6 / 2	3	0.95–1.09:1	1.01:1	4	0.85–1.01:1	0.90:1
10 / 2	4	0.81–0.89:1	0.86:1	4	0.78–0.89:1	0.83:1
9 / 6	2	1.71–1.89:1	1.82:1	3	1.41–1.94:1	1.72:1
15 / 16	4	2.39–2.61:1	2.47:1	4	2.47–2.58:1	2.53:1
20 / 18 %	3	61.2–69.2	64.2	4	68.2–74.1	70.1
22 / 18 %	3	43.8–47.1	45.0	4	43.9–55.5	49.3

Veneza aucta (Fabricius) comb. n.

(Plate 57)

Cimex auctus Fabricius, 1781: 351.81. LECTOTYPE ♂ Grenada (BMNH), here designated, locality here restricted [examined, dissected]

Cimex auctus Fabricius: Fabricius, 1787: 289.100; Gmelin, 1789: 2143.1235.

Lygaeus auctus (Fabricius): Fabricius 1794: 139.18; 1803: 210.26.

Leptoglossus auctus (Fabricius): Stal, 1868: 52.3

[Leptoglossus balteatus (Linnaeus); Uhler, 1893: 705. Misidentification]

[Leptoglossus zonatus (Dallas); Uhler, 1894: 178. Misidentification]

[Leptoglossus balteatus (Linnaeus); Distant, 1901b: 417. Misidentification]

Leptoglossus grenadensis Allen, 1969: 108. Holotype ♂ Grenada (USNM). Syn. n.

General and differential diagnosis: Characteristic features of ♂♂: shape of genital capsule and condition of outer lobe of paramere. Those of ♀♀: shape and size of 1st gonocoxa.

V. aucta shows close relationships with V. zonata, V. opposita and particularly with V. conspersa; from V. opposita and V. zonata it can be differentiated by pale posterior submarginal area, shape of humeral angle,

ratios between length of external tibial dilation and length of tibia; from V. opposita and V. conspersa by the two well defined pronotal spots.

Description: General characters see Allen, 1969: 108.

Male genitalia: Genital capsule (figs. A,B) - posterior margin with very deep rather narrow "U" to "V" shaped notch; dorsal prongs strongly projected postero-dorsally and very acute; the margin lateral to dorsal prongs (a) with obtuse dorso-medial projection (b); inflected portion of posterior margin with a pair of small lateral prominences (c) separated from each other by a shallow concave depression; posterior margin below the level of lateral margins; the latter ascending posteriorly, and flared. Paramere (fig. C,D) - outer lobe very long, rather narrow and acute; shank thick with prominent curved median lobe; hook thick and curved, tapering distally, with small medial apical projection. Phallus (fig. E) - conjunctiva with long apically bulging dorsal sac, similar to that of V. conspersa, except for processes 4a-b which are separated.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) as in V. conspersa.

Measurements and Ratios: (see table 58)

Geographical distribution: (Map 21) Known mainly from the Antilles, but is also found in the northern part of South America; the material available for study was collected in Haiti, most of Grenadine Is., St. Vincent, Trinidad and in Venezuela and Guyana.

Discussion: V. aucta was described by Fabricius in 1781 as Cimex auctus; the original type material consisted of two male specimens which are preserved one each in UZM (Kiel collection) and in BMNH (Bank's collection). In 1868 Stal recognized it as a distinct species, but in 1970 he synonymized it with V. balteata and since then this synonymy was generally accepted. As described above examination of the original specimens showed that this synonymy is erroneous and that V. aucta is a distinct species. Allen (1969) described a new species Leptoglossus grenadensis which represent the same species and therefore L. grenadensis is here formally synonymized with V. aucta (Fabricius).

Material examined

a) Type material: Cimex auctus Fabricius, 2 ♂♂ syntypes, one labelled "America, 63-74" in BMNH (Bank's collection) was designated and labelled as lectotype and the other labelled "auctus" in UZM (Kiel collection) as paralectotype.

Leptoglossus grenadensis Allen ♂ and ♀ paratypes: Grenadines, Becquia I. W.I., H.H. Smith, 1 ♂, 2 ♀ (BMNH); Grenadines, Mustique I. W.I., H.H. Smith, 1 ♂, 1 ♀ (BMNH).

b) Other material: ANTILLES: Guadalupe, 19 - IX - 1914, 1 ♂ (UZM); Haiti, 1 ♂, 2 ♀ (ZSBS); St. Vicente, H.H. Smith, 2 ♂, 1 ♀ (BMNH); Grenada: Lake Antoine (windward side), s.c., 1 ♂ (BMNH); Mount Gay East (Leeward side), s.c., 1 ♂, 2 ♀ (BMNH); Balthazar (windward side), s.c., 3 ♂, 1 ♀ (BMNH); St. Vicente, Hope, 1 ♀ (RNH); Becquia I. Grenadines, H.H. Smith, 2 ♂, 1 ♀ (BMNH); Mustique I., s.c., 1 ♂, 1 ♀, (BMNH); Trinidad, 1 o (IZA). GUYANA: Demarara, 1 ♂ (BMNH). VENEZUELA: 1 ♂ (NMP).

Plate 57

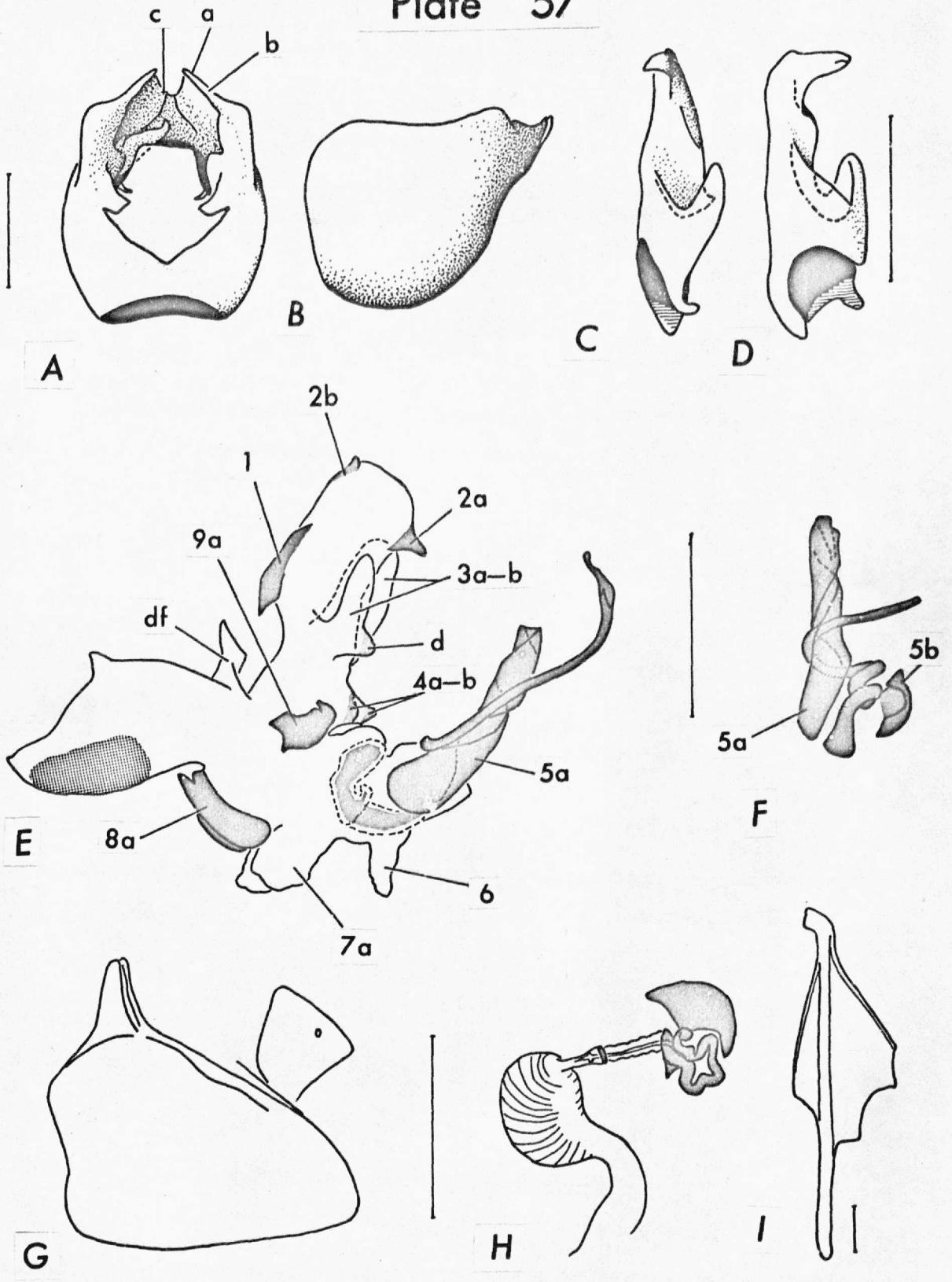


Table 58 Measurements (4 ♂♂ and 1 ♀ from 4 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	4	15.0–16.0	15.5	1	16.0	16.0
2 Head length	4	2.54–3.04	2.71	1	2.85	2.85
3 " width	4	2.05–2.14	2.10	1	2.12	2.12
Distance:						
4 inter-ocular	4	1.08–1.14	1.11	1	1.15	1.15
5 ante-ocular	4	1.21–1.31	1.25	1	1.36	1.36
Antennae:						
6 segm. I length	4	2.51–2.66	2.61	1	2.45	2.45
7 " II "	4	3.26–3.64	3.46	1	3.36	3.36
8 " III "	4	2.40–2.68	2.52	1	2.40	2.40
9 " IV "	3	4.17–4.36	4.28	1	4.32	4.32
Labium:						
10 segm. I length	4	2.28–2.97	2.56	1	2.58	2.58
11 " II "	4	2.12–2.47	2.31	1	2.43	2.43
12 " III "	4	1.14–1.23	1.19	1	1.29	1.29
13 " IV "	4	2.18–2.60	2.36	1	2.39	2.39
14 Pronotum length	4	2.88–2.97	2.92	1	3.11	3.11
15 " width	4	4.89–5.18	4.97	1	5.18	5.18
16 Scutellum length	4	1.84–1.95	1.89	1	2.05	2.05
17 " width	4	1.82–2.01	1.89	1	1.95	1.95
18 Hind tibia length	4	7.82–8.20	8.03	1	7.44	7.44
Tibial dilation:						
19 total width	4	2.20–2.30	2.23	1	2.20	2.20
external part:						
20 length	4	3.84–4.32	4.10	1	3.93	3.93
21 width	4	1.25–1.39	1.31	1	1.29	1.29
internal part:						
22 length	4	2.88–2.97	2.90	1	2.73	2.73
23 width	4	0.48–0.68	0.56	1	0.72	0.72
24 Undilated portion	4	2.54–2.88	2.75	1	2.68	2.68
Ratios: (figures refer to character numbers above).						
1 / 2	4	5.26–6.01:1	5.71:1	1	5.61:1	5.61:1
1 / 18	4	1.89–1.98:1	1.93:1	1	2.15:1	2.15:1
2 / 3	4	1.23–1.43:1	1.29:1	1	1.34:1	1.34:1
6 / 2	4	0.87–1.03:1	0.85:1	1	0.85:1	0.85:1
10 / 2	4	0.87–0.97:1	0.94:1	1	0.90:1	0.90:1
9 / 6	3	1.57–1.73:1	1.64:1	1	1.76:1	1.76:1
15 / 16	4	2.57–2.65:1	2.62:1	1	2.52:1	2.52:1
20 / 18 %	4	48.7–53.5	51.0	1	52.8	52.8
22 / 18 %	4	35.1–36.8	36.1	1	36.6	36.6

Veneza zonata Dallas, 1852 comb.n

(Plate 58)

Anisoscelis zonata Dallas, 452.3. NEOTYPE ♂ Mexico (BMNH) here designated [examined, dissected]

Anisoscelis zonata Dallas: Walker, 1871: 124.3

Anisoscelis vexillatus Stål 1855: 185. Lectotype ♂ Colombia (NR) designated by Allen, 1969: 110 [examined]

Theognis zonatus (Dallas): Stal, 1862: 295.150.

Theognis vexillatus (Stål): Stal, 1862: 295.150; Mayr, 1866: 101.

Theognis vexillatus var. angustifolium Mayr, 1866: 102.

Leptoglossus zonatus (Dallas): Stal, 1870, 162.6; Uhler, 1876: 298.2; Distant, 1881: 125.4; Lethierry & Severin, 1894: 49; Van Duzee, 1917: 88; Gibson, 1917: 72; Blote, 1936: 30; Torre-Bueno, 1941: 50.1; Allen 1969: 110.

Leptoglossus vexillatus (Stal): Stal 1870: 162.7; Lethierry & Severin, 1894: 49.

General and differential diagnosis: V. zonata shows close relationships with V. conspersa, V. aucta and particularly with V. opposita; with the latter it shares an addition to the characters mentioned in the discussion of V. conspersa, the following: similar genital capsule, general shape of paramere, conditions of the distal part of dorsal sac,

and of processes 9a-b and 5a. From V. opposita it can be distinguished by: two ovoidal pale yellow spots on pronotum, transverse patch on corium, shape of process 3a and shape and size of processes 4a-b. (For differences between this and the other two species see discussion on those species).

Description: General characters see Allen 1969: 110.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep and wide quadrate to subtrapezoidal notch; dorsal prongs (a) very acute, strongly projecting dorso-posteriorly, and slightly deflected medially; the margin lateral to dorsal prongs very slightly curved (b); inflected portion of posterior margin with a pair of small lateral prominences (c) separated from each other by a shallow depression; posterior margin slightly below the lateral margins; the latter horizontal and flared, dorsally expanded near the posterior margin. Paramere (fig. C,D) - outer lobe large, wide and rounded; shank thick with prominent median lobe; hook strongly curved, long, tapering distally with very small medial apical projection. Phallus (fig. E) - conjunctiva with long dorsal sac, slightly bulging distally, and with the right side of the apex higher than the left one; conjunctiva armed with the following processes: 1 heavily sclerotized, small and stout, with acute tip and irregular surface; 2a-b heavily sclerotized moderately long, pointed, 2a well below the level of 2b and level with process 1; 3a-b membranous and elongate, 3b tapering distally and weakly sclerotized, 3a with the distal portion narrow and elongate and with an additional large weakly sclerotized ventro-proximal lobe (d);

4a-b moderately sclerotized, very conspicuous and rounded, very close to each other, 4b slightly longer than 4a; 9a-b heavily sclerotized, very conspicuous wide and stout, terminating in flat obtuse to acute tip, sometimes skewed tip; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, with the second convolution long, and uniformly thick.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) very similar to that of V. conspera, but slightly longer.

Measurements and Ratios: (see table 59)

Geographical distribution: (Map 21) This species has a very wide distribution, extending in the north to the south western part of U.S.A. and in the south to Uraguay and northern part of Argentina.

Habitat and Biology: Adults have been collected throughout the whole year but the number of collected specimens suggest that at least in the northern part of South America it is most common from June to November. During the dissections, fully developed eggs were found in three females from Venezuela, collected in August, September and December, the eggs are subcylindrical with one side flat, length 1.46mm, width 1.23mm, height 0.91mm.

V. zonata has been reported as pest of: Sorghum spp (Hayes, 1922), Gossypium spp (Morrill, 1917); Psidium sp, Citrus spp and Urena lobata (Araujo, 1967), and also on: Saceharum officinarum, Phaseolus vulgaris,

Vigna unguiculata, Datura stramonium, Lycopersicum esculentum and Solanum Melongenz. (Venezuela)

Material examined

a) Type material: Neotype of Anisoscelis zonata Dallas. The type of this species could not be found in the BMNH where all type material of Dallas is preserved. This species closely resembles V. neovexillata and V. impictipennis and frequently these species have been confused; three of the syntypes of Leptoglossus impictipennis Stal are in fact misidentified specimens of V. zonata; in the interest of stability of nomenclature, a neotype for Anisoscelis zonata is necessary, and in the course of this study, a male specimen from Mexico, Puebla, Salle, labelled "B.C.A., Hem. 1. Leptoglossus zonatus", in BMNH was chosen as neotype and accordingly labelled. This specimen fully agrees with Dallas' original description.

b) Other material: ARGENTINA: Chaco, 5 - XI - 1897, C. Bruch, 1 ♀ (NM); O.W. Thomas, 1 ♀ (BMNH). BOLIVIA: Sta. Cruz, Steinbach, 4 ♂, 2 ♀ (ZI); 3 ♀ (BMNH); Prov. Lara, 750m, s.c., 1 ♂, 1 ♀ (MNHU); Chapare, Zischka, 1 ♂ (RNH). BRASIL: Saunders, 1 ♂ (BMNH); Prov. Goias, 1 ♀ (BMNH); 1 ♂ (IRSNB); Bahia, Lacerda, 1 ♂ (IRSNB); Amazon, Fonteboa, 1 ♂, 1 ♀ (NR); Amazon, sup., Olivenca, 1 ♀ (NR); Rogue, 13 - VI - 1925, Melin, 1 ♂, 3 ♀ (NR); Rio de Janeiro, Gavea, 30 - I - 1944, Wygodzinky, 1 ♀ (NMP); 4 ♀ (NMP); Rio Grande 1 ♂ (TM); s.d., 1 ♀ (NM); 1 ♀ (ZSBS); 1 ♂, 2 ♀ (NM); Schott, 1 ♀ (NM); Para, Rio Trombetas, E. le Moult, 1 ♂ (RN). COLOMBIA: Caucathal, 1000m, III - 1908, 1 ♂ (DEI); Bogota, 1 ♂ (MNHU); Cauca,

Santa Rosa, entre San Francisco y Cartago, - IV - 1878, E. Garzon, 1 ♂, 1 ♀ (RNH); 1 ♀ (NM); Caucathal, Jumbo, 1000m, 1 ♂, 1 ♀ (DEI); Bogotá, 1911, 1 ♂, 1 ♀ (BMNH); Cali, 1 ♂ (BMNH); Bogota, 1862, 2 ♂, 1 ♀ (MNHN); s.l., Bobisch, 1 ♀ (MNHU); Villa Vicencio, 1 ♀ (MNHU); Sta. Marta, 1853, ♀ (MNHN); Cali, 30 - VII - 1959, J.G. Bebren 1 ♀ (RN); s.d., s.c., 1 ♀ (RN). COSTA RICA: San Jose, Biolley, 1 ♀ (ZI); s.d., 1 ♂ (TM); s.l., 1 ♀ (DEI); 1897, L. Montandon, 1 ♀ (MNHN); 1920, P. Serre, 1 ♀ (MNHN); - XII - 1926, s.c., 1 ♂, ♀ (MNHN); 1921, s.c., 1 ♀ (MNHN); de Lafon, 1 ♂ (MNHN). ECUADOR: Paramba, Rosenberg, 1 ♂ (BMNH); 1897, L. Montandon, 1 ♂, 1 ♀ (MNHN). GUATEMALA: Chiquimala, 600-1000m, 1908, R. Guerin, 1 ♂, 1 ♀ (MNHN); Angrand, 2 ♀ (MNHN); Jalapa, Hoege, 1 ♂ (BMNH); 1 ♀ (NMP); San Isidro, 480m, 1 ♂, 1 ♀ (BMNH); San Geronimo, Champion, 1 ♂, 1 ♀ (BMNH); Antigua, J. Stehlik, 1 ♂ (BMNH); Volcan de Atitlan 0 - 1050m, Champion, 1 ♂ (BMNH); s.d., 1 ♂ (NM); El Reposo 240m, Champion, 1 ♂, 1 ♀ (BMNH); Cerro Zunil 0 - 1500m, Champion, 1 ♂ (BMNH). HONDURAS: 1 ♀ (BMNH). MEXICO: Vera Cruz, Cordoba, Fortin, 900m, 12 - X - 1962, C. & O. Epping, 1 ♀ (RN); Tenax, N. Yucatan, Gaumer, 1 ♂ (IRSNB); s.d., 1 ♂, 1 ♀ (NM); s.d., 1 ♂, 2 ♀ (NR); s.d., 1 ♂ (TM); s.d., 2 ♂ (MNHU); s.d., 1 ♂ (IRSNB); s.d., 1 ♂, 1 ♀ (UM); s.d., 1 ♂, 2 ♀ (BMNH); Chilpancingo Guerrero, 1380m, June, H.H. Smith, 1 ♀ (BMNH); Ventanas 600m, Forrer, 1 ♀ (BMNH); Tepic, Schumann 1 ♀ (BMNH); Oajaca, 1 ♀ (BMNH); Orizaba, M. Salle, 1 ♀ (BMNH); 2 ♀ (UM); Presidio, Forrer, 1 ♂ (UM); Atoyac, Vera Cruz, Schumann, 1 ♀ (BMNH); 1 ♂ (BMNH); 1 ♀ (MNHN); 1895, G. Fallou, 3 ♂, 2 ♀ (MNHN); Tabasco, s.d., s.c., 1 ♂ (MNHN); Baja California, Boleon 1891, 1 ♂, 2 ♀ (MNHN); Guadalajara, Puebla, 1903, L. Diguet, 2 ♂ (MNHN); Jalisco, s.d., s.c.,

1 ♀ (MNHN); Baja California, 1895, L. Diguet, 2 ♂, 4 ♀ (MNHN); Baja California, La Paz, s.c., 1 ♀ (MNHN); Guadalajara, 1897, s.c., 1 ♀ (MNHN); Vera Cruz, Frudrich, 1 ♀ (RNH); Keng, 1 ♂, 1 ♀ (RNH); 1 ♀ (RNH); 1 ♂ (TM); Leibold, 2 ♂, 2 ♀ (UZM); 1932, Standinger, 1 ♂ (RNH); 1 ♂ (RNH); 1 ♂ (ZI); Salle, 2 ♂, 3 ♀ (NR); Boucard, 2 ♀ (NR); Hoege, 1 ♂ (NR); s.d., 1 ♀ (UM); 1 ♀ (NR); Balzas Guerrero, Standinger - Bang-Haas, 1 ♂ (ZI); 1883, Bilinek, 4 ♂, 2 ♀ (NM); Prizaba, 1883, s.c., 4 ♂, 5 ♀ (NM); Volcan Colima, 3 - 21 - X - 1918, J. Lave, 8 ♂, 8 ♀ (ZSBS); s.d., 2 ♂, 2 ♀ (IZA); 3 ♂, 9 ♀ (ZSBS); C.A. Purpus, 2 ♂, 1 ♀ (MNHU); Sierra Mixteca, s.c., 1 ♀ (MNHU); San Louis Potosi, Tampico, - VIII - 1911, Purpus, S.V., 1 ♀ (MNHU). PANAMA: 1889, R. Criave, 1 ♀ (MNHN); Bugaba, 250-450m, Champion, 1 ♀ (IRSNB); s.d., 1 ♀ (UM); s.d., 1 ♂, (TM); s.d., 1 ♂ (NR); Volcan de chiriqui, 0 - 1200m, s.c., 2 ♀ (IRSNB); s.d., 1 ♀ (NR); s.d., 1 ♀ (TM); $s\frac{1}{2}d\frac{1}{2}$. 1 ♂ (NM); s.d., 1 ♂, 1 ♀ (MNHU); s.d., 2 ♂, 2 ♀ (BMNH); s.d., 1 ♂ (UM); Standinger, 1 ♀ (ZI); Chiriqui, 1 ♂, 1 ♀ (TM); 1 ♂, 1 ♀ (DEI); 1924, L.E. Chesman, St. George Exp., 1 ♂ (BMNH). PARAGUAY: Sept., Fiebrig, 1 ♀ (MN). PERU: 1 ♂ (IRSNB); Puerto Inca, Rio Pachitea, 1 ♀ (RNH); Galalea, 1 ♂ (UZM); Tarapopo, 4 ♀ (NR); Cumbase, 1 ♂ (NR); Yarimaguas, 1886, Salle, 3 ♂ (MNHN); San Antonio, Rio Huallaga, 350m, 1932, G. Klug, 1933, Nagel, 1 ♀ (DEI); Jumbatis, Rio Huallaga, 350m, s.c., 1 ♂ (DEI). URUGUAY: Montevideo, 1 ♀ (MNHN). U.S.A.: San Ignacio de California, 1 ♀ (BMNH). VENEZUELA: Aragua: Cagua, 450m, 12 - VIII - 1949, S. Labrador, 1 ♀ (IZA); El Limon, 450m, 18 - VIII - 1966, D. Villasmil, 1 ♂ (IZA); La Victoria, 18 - XI - 1959, M. Cermeli, 1 ♂ (IZA); Cagua, 10 - IX - 1963, R. Bastida, en fruto Guayaba, 1 ♀ (SSPA); Tasajeras, 28 - VIII - 1945, F. Fernandez Yepez, R.G.L., en Algodon, 2 ♀ (IZA); El Saman, 6 - IX - 1954,

F. Fernández Yépez, en Algodon, 1 ♂ (IZA); Rancho Grande, 1100m, 2 - XI - 1951, C.J. Rosales, 1 ♂ (IZA); Maracay, 450m, 6 - VIII - 1962, J.M. Uzcategui, 1 ♀ (IZA); s.l., 22 - X - 1947, F. Fernandez Yepez, 1 ♂ (IZA); s.l., 19 - X - 1950, F. Fernández Yépez, 1 ♀ (IZA); s.l., 3 - VII - 1958, F. Fernández Yépez, 1 ♂ (IZA); Villa de Cura, 1923, M. Grisol, 1 ♀ (MNHN); El Limon, 450m, 23 - VI - 1967, J.C. Marín, 1 ♀ (IZA); s.l., 21 - IX - 1965, s.c., 1 ♂ (IZA); s.l., 26 - XII - 1950, J.R. Requena, 1 ♀ (IZA); s.l., 26 - IX - 1966, A. Dàscoli, on pepinillo, 1 ♀, 1 ♂ (IZA); s.l., 23 - X - 1950, F. Fernández Yépez, 1 ♂, 2 ♀ (IZA); s.l., 17 - VII - 1951, R. Requena, on Berenjena, 1 ♀ (IZA); s.l., 23 - X - 1950, R. Labrador, 1 ♂ (IZA); s.l., 28 - IX - 1965, D. Villasmil, 1 ♀ (IZA); Carabobo: Mariara, 460m, 7 - XII - 1966, L.A. Fernándes Solis, 1 ♀ (IZA); Puerto Cabello, 2 ♀ (NR); Valencia, F. Kummerow, 2 ♂, 1 ♀ (MNHU); Guárico: Hato El Samán, Las Mercedez, 11 - 12 - X - 1967, C.J. Rosales, A. Martinez, 1 ♂ (IZA); Lara: Tocuyo, 7 - VIII - 1963, R. Bastidas, 1 ♂ (SSPA); Merida: 1 ♂ (RNH); 1 ♂ (RNH); 3 ♂, 2 ♀ (NR); s.d., 1 ♀ (TM); Briceno, 1 ♂ (TM); s.l., 1 ♂, 1 ♀ (NM); 18 - VIII - 1965. 1 ♂, 1 ♀ (ZSBS); Dist. Campo Elias, Ejido, 1200m, 6 - ix - 1938, J. Hanbury Tracy, 1 ♂ (BMNH); Miranda: San Diego, 9 - X - 1959, M. Cermeli, 1 ♀ (IZA); Monagas: Jusepin, 21 - IX - 1965, F. Fernández Yépez, C.J. Rosales on Frijol, 1 ♂, 2 ♀ (IZA); s.l., 15 - IX - 1965, s.c., on Frijol, 1 ♂, 1 ♀ (IZA); s.l., 7 - IX - 1965, s.c., 1 ♂ (IZA); Quebrada Seca, o - 100m, 15 - IX - 1965, s.c., 3 ♂, 1 ♀ (IZA); Caripito, 50m, 7 - VIII - 1966, s.c., 1 ♂ (IZA); Portuguesa: Araure, 27 - XI - 1963, E. Alvarado, on Saccharum officinarum L., 1 ♂ (SSPA); Tachira: San Cristobal, 9 - v - 1949,

F. Fernández Yepez, on Berenjena, 1 ♀ (IZA); Trujillo: Valera, no date, N. Angeles, on Citrus (fruits), 1 ♀ (IZA); El Cenizo, 9 - IX - 1950, P. Fenjives, 1 ♂; Zulia: Kasmera, rio Yasa, Sierra de Perijá, 23 - XI - 1961, F. Fernández Yepez, C.J. Rosales, 1 ♀ (IZA); Mene Grande, 18 - VII - 1963, O. Cedeño, on Guaba (fruit), 1 ♀ (SSPA); Dist. Federal: El Valle, 5 - IV - 1938, C.H. Ballou, on Datura stramonium L., 1 ♀ (CIA); s.l., 17 - I - 1950, F. Fernandez Yepez, on nongue, 1 ♂ (IZA); s.l., 30 - I - 1950, s.c., on Frijol, 1 ♂, 1 ♀ (IZA); Caracas, 24 - VII - 1950, S. Ghersi, 1 ♀ (IZA); Caracas, - X - 1926, Woronov, 1 ♀ (ZI); La Guaira, 2 ♀ (NM); s.l., Camuri Chico, 16 - VIII - 1949, P. Vulg, 1 ♂ (ZSBS); Caracas, Pico Avila, s.c., 1 ♂ (ZSBS); s.l., 3 ♂ (MNHU); La Guayra, 3 ♂, 1 ♀ (MNHU).

c) Material without data: 1 ♀ (NM); 1895, G. Fallou, 1 ♂, 1 ♀ (MNHN); 1898, Novalhier, 2 ♂, 4 ♀ (MNHN); Llanos, F. Geay, 33-96, 1 ♂, 1 ♀ (MNHN).

Plate 58

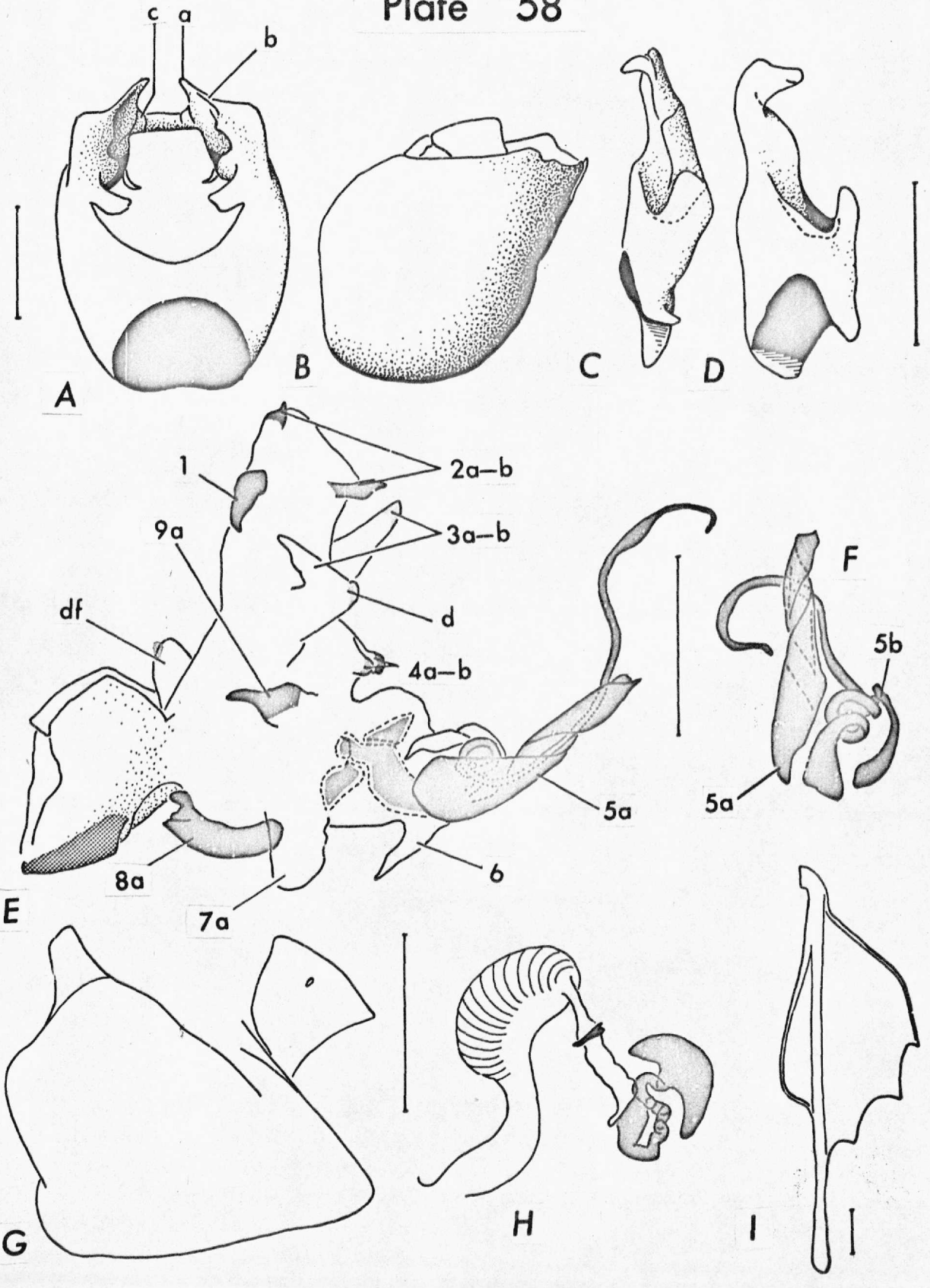


Table 59 Measurements (5 ♂♂ and 5 ♀♀ from 8 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.5–21.0	18.6	5	19.5–22.0	20.9
2 Head length	5	2.90–3.28	3.06	5	3.11–3.51	3.37
3 " width	5	1.31–2.54	2.09	5	1.31–2.81	2.33
Distance:						
4 inter-ocular	5	1.14–1.44	1.24	5	1.25–1.48	1.36
5 ante-ocular	5	3.55–4.12	3.73	5	3.64–4.41	4.06
Antennae:						
6 segm. I length	5	2.67–3.19	2.97	5	2.71–3.42	2.96
7 " II "	5	3.69–4.80	4.25	5	3.36–5.08	4.31
8 " III "	5	2.73–3.40	3.02	5	2.40–3.74	3.02
9 " IV "	4	4.70–5.18	4.96	4	4.12–5.18	4.81
Labium:						
10 segm. I length	5	2.79–3.19	2.97	5	2.75–3.61	3.24
11 " II "	5	2.75–3.19	2.93	5	2.79–3.49	3.20
12 " III "	5	1.52–1.86	1.62	5	1.52–2.01	1.82
13 " IV "	5	2.85–3.64	3.18	5	2.92–3.89	3.49
14 Pronotum length	5	3.36–4.08	3.76	5	3.74–4.80	4.17
15 " width	5	4.99–6.48	5.68	5	6.14–7.44	6.53
16 Scutellum length	5	2.10–2.66	2.28	5	2.18–3.04	2.60
17 " width	5	1.90–2.54	2.26	5	2.24–2.96	2.60
18 Hind tibia length	5	8.73–13.7	10.3	5	8.35–11.6	10.0
Tibial dilation:						
19 total width	5	2.97–3.84	3.24	5	3.12–4.56	3.63
external part:						
20 length	5	5.76–6.48	6.00	5	5.04–8.40	6.31
21 width	5	1.87–2.44	2.07	5	1.96–3.26	2.40
internal part:						
22 length	5	3.84–4.80	4.36	5	3.60–5.66	4.68
23 width	5	0.62–0.96	0.76	5	0.84–1.10	0.94
24 Undilated portion	5	2.01–2.88	2.42	5	2.16–3.42	2.68
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.65–6.40:1	6.03:1	5	6.14–6.27:1	6.20:1
1 / 18	5	1.73–1.89:1	1.80:1	5	1.89–2.33:1	2.09:1
2 / 3	5	1.29–2.21:1	1.46:1	5	1.21–2.37:1	1.44:1
6 / 2	5	0.91–1.10:1	0.97:1	5	0.79–0.97:1	0.87:1
10 / 2	5	0.92–1.03:1	0.97:1	5	0.88–1.05:1	0.96:1
9 / 6	4	1.50–1.76:1	1.63:1	4	1.46–1.78:1	1.60:1
15 / 16	5	2.33–2.67:1	2.49:1	5	2.43–2.81:1	2.51:1
20 / 18 %	5	50.9–65.9	58.2	5	56.4–72.4	63.1
22 / 18 %	5	33.9–48.0	42.3	5	43.1–50.0	46.8

Veneza opposita (Say), 1832 comb.n

(Plate 59)

Anisoscelis oppositus Say, 1832: 327.3. Holotype U.S.A. (lost).

Anisoscelis tibialis Herrich-Schaeffer, 1844: 12. Holotype o U.S.A. (lost). [Synonymized by Stal, 1870: 163.11]

Anisoscelis tibialis H. -S.: Dallas, 1852: 453.5; Walker: 1871: 125.5.

Leptoglossus oppositus (Say): Stal, 1870: 163.11; Lethierry & Severin, 1894: 48; Distant, 1900a: 691; Van Duzee, 1917: 89; Gibson, 1917: 71; Blatchley, 1926: 223, fig. 44; Deay, 1928: 378; Torre-Bueno, 1941: 50; Froeschner, 1942: 597; Drew and Schaefer, 1963: 114; Allen, 1969: 123.

Theognis oppositus (Say): Hussey, 1953: 31.

General and differential diagnosis: Pronotum without pale yellow spots, postero lateral margin entire, corium without transverse patch, process 3a of conjunctiva bifid. These characters distinguish this species from the related species V. conspersa, V. aucta and V. zonata.

Description: General characters see Blatchley, 1926: 223, fig. 44; Allen, 1969: 123.

Male genitalia: Genital capsule and paramere (figs. A,B,C,D) as in V. zonata. Phallus as described for V. zonata except for process 3a which is long with bifid tip (d).

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca fig. H as in V. zonata.

Measurements and Ratios: (see table 60)

Geographical distribution: (Map 21) Most of the material is known from U.S.A., although Distant 1900a has reported it from Mexico, Orizaba.

Material examined

U.S.A. Ohio, Columbus, 7-X-1914, C.J. Drake 2 ♂ (BNNH); Illinois, Urbana, 20-X-1931, J. Stehlik, 1 (BMNH); Indiana, Vincennes, 22-X-1931, s.c., 2 ♂ (BMNH); Illinois, Urbana, 9-X-1911, A.W.J. Pomeroy, 1 ♀ (BMNH); Illinois, Havana, 4-V-1912, s.c., 1 ♂ (BMNH); Florida, Gainsville, - II-1921, W.S.Blatchley, 1 ♂ (BMNH); 1 ♂ (BMNH); Washington D.C., 1 ♀ (BMNH); Ohio, Columbus, 7-X-1914, C.J. Drake, 1 ♂ (MNHN); Georgia, Morrison, 1 ♂ (NR); Hooker, 1 ♂ (NR); 1 ♂ (NR); Belfrage, 1 ♀ (NR), O.M. Reuter, 2♀ (ZMU); New Jersey, Elmer, 26-VII-1921, J.C. Lutz, 1 ♀ (ZI); Massachusetts, 10-XI-1937, Zhenzhurist, 1 ♂ (ZI); Illinois, 1 ♂ (TM); Texas, 1875, Boll, 1 ♂ (NM); Georgia, 1 ♂ (NM); 1 ♂ (ZS); Carolina, 1♂, 3 ♂♀ (MNHU); Kentucky, 1 ♂ (RNH).

Plate 59

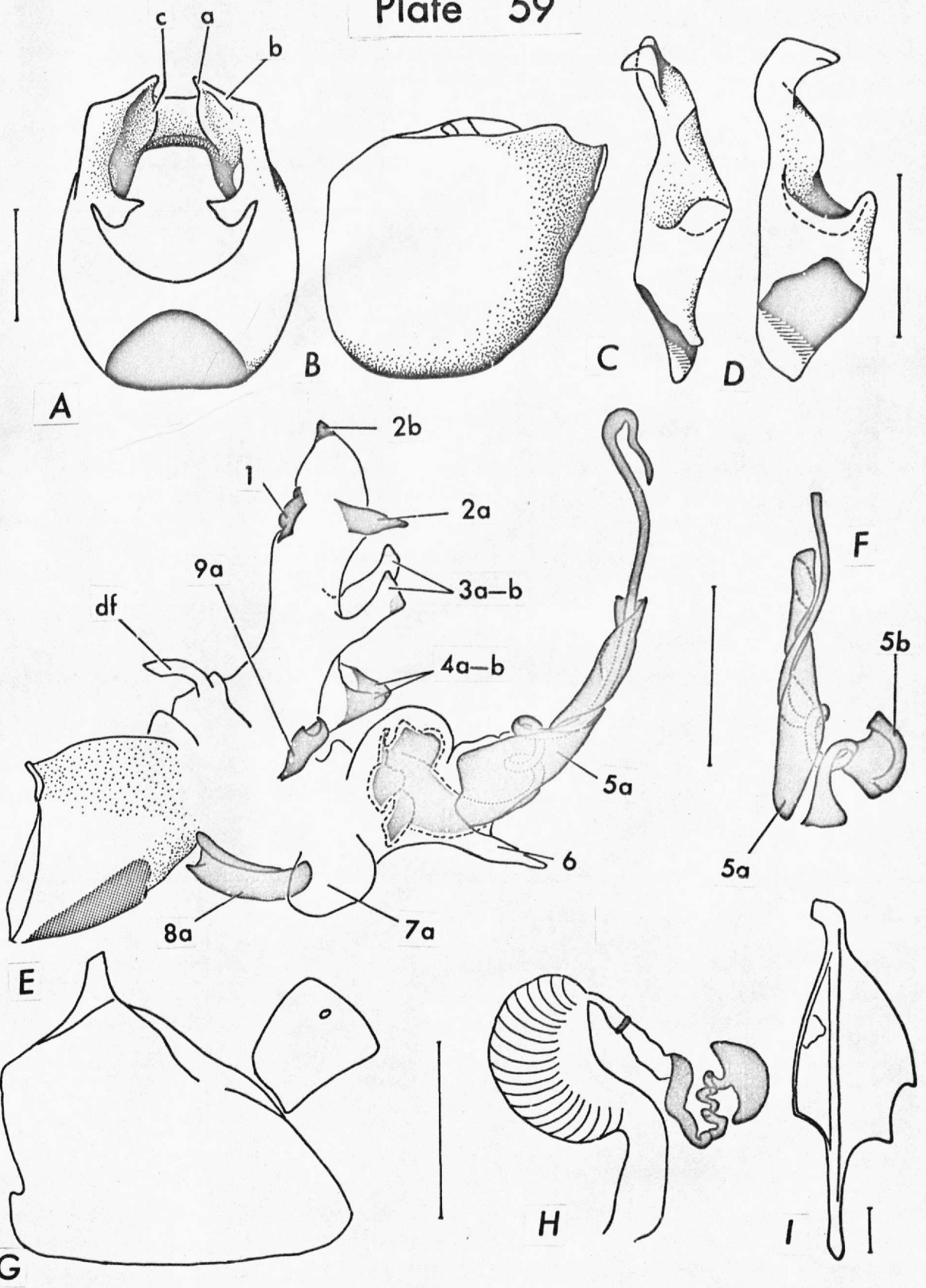


Table 60 Measurements (3 ♂♂ and 3 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	17.0–21.5	19.1	3	15.0–21.0	18.3
2 Head length	3	2.66–3.38	2.99	3	3.04–3.19	3.14
3 " width	3	2.14–2.51	2.32	3	2.35–2.51	2.43
Distance:						
4 inter-ocular	3	1.17–1.42	1.30	3	1.36–1.42	1.40
5 ante-ocular	3	1.36–1.65	1.51	3	1.55–1.67	1.61
Antennae:						
6 segm. I length	2	2.18–2.54	2.36	2	2.47–2.71	2.77
7 " II "	2	3.36–3.98	3.67	2	3.84–4.08	3.96
8 " III "	2	2.25–2.78	2.51	1	2.73	2.73
9 " IV "	2	3.79–4.46	4.12	–	—	—
Labium:						
10 segm I length	3	2.66–3.23	2.94	2	3.04–3.06	4.51
11 " II "	3	2.58–3.23	2.83	2	2.69–2.96	2.82
12 " III "	3	1.36–1.71	1.54	2	1.52–1.55	1.53
13 " IV "	3	2.85–3.66	3.23	2	3.40–3.45	3.42
14 Pronotum length	3	3.12–4.22	3.66	3	3.84–4.32	4.11
15 " width	3	4.80–6.24	5.55	3	5.85–6.91	6.42
16 Scutellum length	3	1.91–2.62	2.27	3	2.37–2.66	2.55
17 " width	3	2.07–2.47	2.27	3	2.47–2.66	2.58
18 Hind tibia length	3	6.57–8.68	7.61	3	7.82–8.64	8.25
Tibial dilation:						
19 total width	3	2.06–2.97	2.65	3	2.40–2.88	2.70
external part:						
20 length	3	3.84–5.76	4.72	3	4.80–5.56	5.26
21 width	3	1.00–1.82	1.53	3	1.34–1.87	1.67
internal part:						
22 length	3	3.16–4.80	3.85	3	3.84–4.32	4.16
23 width	3	0.68–0.84	0.76	3	0.68–0.80	0.73
24 Undilated portion	3	1.92–2.20	2.01	3	2.11–2.40	2.22
Ratios: (figures refer to character numbers above).						
1 / 2	3	6.36–6.39:1	6.38:1	3	4.93–6.58:1	5.82:1
1 / 18	3	2.47–2.58:1	2.50:1	3	1.91–2.53:1	2.21:1
2 / 3	3	1.24–1.34:1	1.28:1	3	1.27–1.31:1	1.29:1
6 / 2	2	0.81–0.86:1	0.84:1	2	0.77–0.84:1	0.86:1
10 / 2	3	0.95–1.00:1	0.98:1	2	0.95:1	0.95:1
9 / 6	2	1.73–1.75:1	1.74:1	–	—	—
15 / 16	3	2.38–2.51:1	2.44:1	3	2.48–3.31:1	2.51:1
20 / 18 %	3	58.4–66.3	62.0	3	61.3–67.0	63.7
22 / 18 %	3	47.4–55.2	50.5	3	49.1–52.1	50.4

Veneza neovexillata (Allen) 1969 comb.n

(Plate 60)

Leptoglossus neovexillatus Allen 1969: 113. Holotype ♂, Brasil (CM).

General and differential diagnosis: Process 2b of conjunctiva obsolete. V. neovexillata shows close relationships with V. impictipennis, sharing: similar variation in the colour pattern of pronotum, pronotum strongly declivent, similar general shape of paramere and process 3a without additional proximal lobe. V. neovexillata can be distinguished from V. impictipennis by: not serrate postero lateral margin of pronotum, ratio between length of external tibial dilation and length of tibia, the condition of process 2b of conjunctiva (in impictipennis the process 2b is spinose), and more prominent outer lobe of paramere.

Description: General characters see Allen 1969: 113.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep and wide rounded to quadrate notch; dorsal prongs (a) stout, moderately projecting dorso posteriorly and not deflected medially; the margin lateral to dorsal prongs slightly protruding dorso-medially (b); inflected portion of posterior margin with a pair of small lateral prominences (c), separated from each other by a shallow quadrate

depression; posterior margin slightly below the lateral margins; the latter gradually rising posteriorly, and slightly flared. Paramere (fig. C,D) - outer lobe of medium size, subtriangular; shank thin with prominent median lobe; hook strongly curved and short, tapering distally with small medial apical projection. Phallus (fig. E) - conjunctiva with moderately long dorsal sac, and similar to that of V. zonata, except for processes 1, raised, wide and somewhat rounded, with irregular rough surface; process 2b obsolete, only represented by small slightly sclerotized area, process 3a without additional lobe and 3b very large and bulging; processes 4a-b of equal size and separated from each other, and 9a-b with anterior thick projection.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G., spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of the duct long widening towards the base and strongly curved near the duct dilation.

Measurements and Ratios: (see table 61)

Geographical distribution: (Map 23) This species is known only from the southern half of South America, the material available for study was collected in Peru, Brasil, Bolivia, Paraguay and Argentina.

Material examined.

a) Type material: Paratypes: ARGENTINA: Prov. Salta, 2500m, J. Steinbach S.V., 2 ♂, 1 ♀ (MNHU), s.l., - V - 1905, s.c., 1 ♀ (MNHU);

San Ignacio, Misiones, 8 - X - 1941, Biraben-Bezzi, 2 ♀ (MLP); Prov. de Buenos Aires, Bosq, 1 ♀ (MLP). BOLIVIA: J. Steinbach, 1 ♂, 1 ♀ (BMNH). BRASIL: Parana, Tibagye, V. Konigswald, 1 ♂ (MNHU); Malto Grosso, S. Moore, 1 ♀ (BMNH); Rio Grande, 1 ♂, 1 ♀ (TM); Sele Lagoa, Reinh, 1 ♀ (UZM); Lund, 1 ♀ (UZM); Minas Geraes, 1 ♀ (NR); Bahia, Iguassu, 22 - VIII - Roman, 1 ♀ (NR); Bilbao, 1904, 1 ♀ (NR). PERU: Vilcanota, 1 ♂ (TM).

b) Other material: ARGENTINA: Salta, J. Kunckel, 1899, 1 ♀ (MNHN); Salta, Las Canas, III - 1938, 1 ♀ (MLP); Misiones, San Ignacio, Villa Lutecia, E.R. Wagner, 1910, 1 ♂ (MNHN). BOLIVIA: Chiquitos Robore 300m, 20 - 12 - 1953, W. Foster, 1 ♂, 2 ♀ (IZA). BRASIL: Rio Grande do Sul, 1 ♀ (IZA); 1 ♂, 4 ♀ (IZA); Nova Teutonia, F. Plauman, 9 ♂, 6 ♀ (ZSBS); 1 ♂, 1 ♀ (ZSBS); Prov. Rio de Janeiro, Montagnes des Orgues, Tujuca, 500-1000m, E.R. Wagner, 2 ♀ (MNHN); Rio, 4 ♀ (MNHU); Matto Grosso, Jpieme, 1 ♂ (MNHU); Nova teutonia, 3 ♂, 4 ♀ (IZA); Pippingsk, 1 ♀ (ZMU); Blumman, 1 ♂ (ZMU); Nova teutonia, F. Plaumann, 1 ♂, 1 ♀ (ZMU); Sta Catarina, Colonia Hansa, H. Rolle, 1 ♂ (DEI); Sta Catarina, F. Hoffman, 1 ♀ (DEI); Diamantina, 1 ♀ (ZI); Prov. Goyas, Jatahy, IX - XI - 1897, 1 ♀ (ZI); 1 ♀ (NM); Prov. Goyas, 1 ♀ (BMNH); Rio Gr. do Sul, Stieglmayr, 1 ♀ (NM); R. Gr. do Sul, Cruz Alta, 1 ♀ (RNH); S. Paulo, 1 ♂, 1 ♀ (RNH). PARAGUAY: S. Bernardino, 1 ♀ (IZA); Villa Rica, F. Schade, 1 ♀ (ZMU); Molinos, - XI - 1925, F. Schade, 1 ♂ (ZMU).

Plate 60

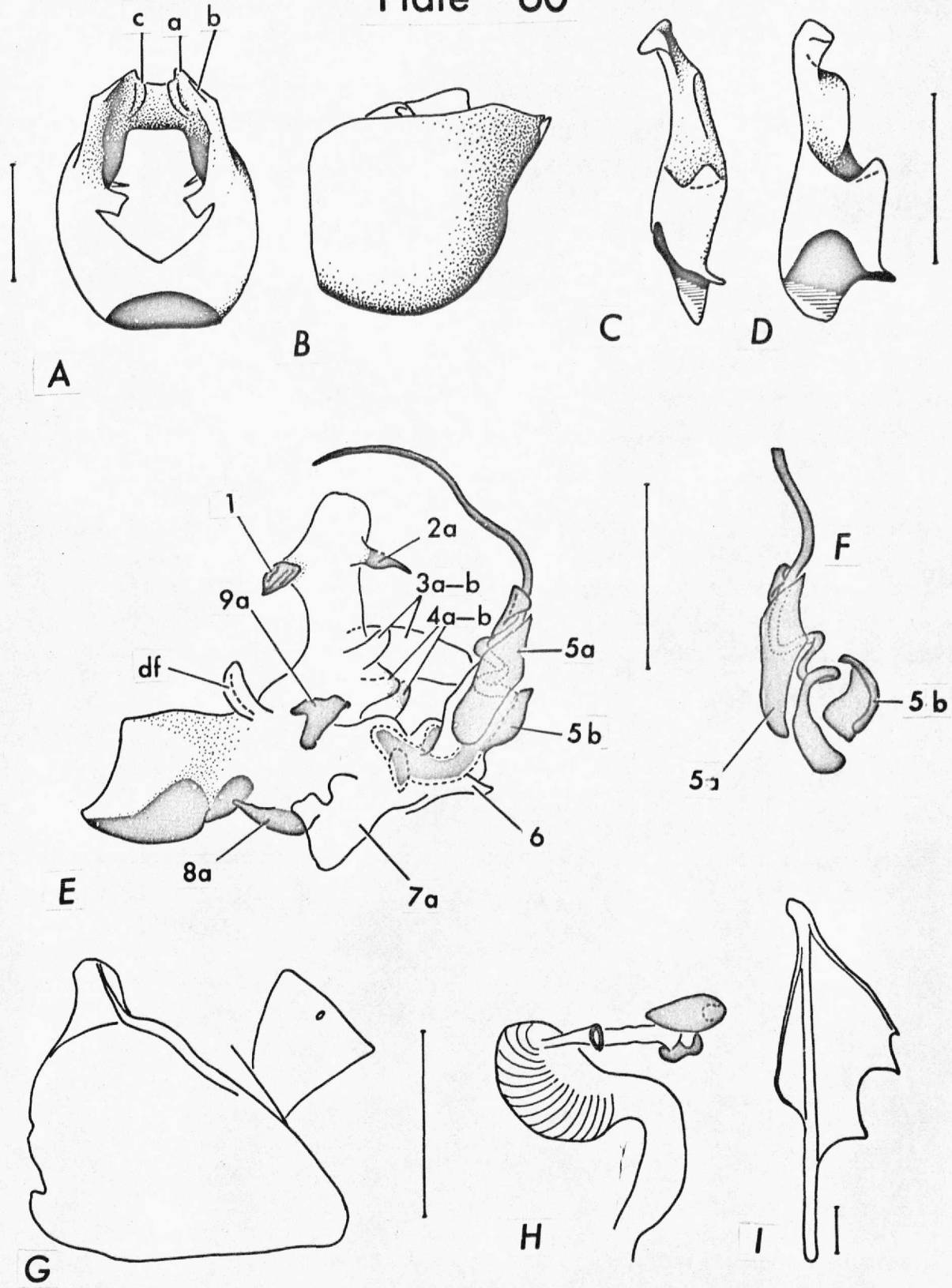


Table 61 Measurements (5 ♂♂ and 5 ♀♀ from 9 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.2-17.8	16.6	5	17.0-19.8	18.6
2 Head length	5	2.37-2.85	2.64	5	2.51-3.23	2.89
3 " width	5	2.07-2.14	2.10	5	2.09-2.39	2.26
Distance:						
4 inter-ocular	5	1.10-1.25	1.15	5	1.15-1.29	1.24
5 ante-ocular	5	1.25-1.38	1.32	5	1.23-1.61	1.46
Antennae:						
6 segm. I length	5	2.58-2.90	2.72	5	2.47-2.90	2.71
7 " II "	5	3.50-4.08	3.87	5	3.64-4.17	3.97
8 " III "	5	2.49-2.92	2.73	5	2.64-3.16	2.81
9 " IV "	5	3.64-4.80	4.32	4	3.50-4.65	4.22
Labium:						
10 segm. I length	5	1.90-2.47	2.22	5	2.31-2.85	2.62
11 " II "	5	1.90-2.43	2.17	5	2.37-2.85	2.54
12 " III "	5	1.14-1.34	1.21	5	1.25-1.52	1.35
13 " IV "	5	1.84-2.75	2.29	5	2.43-2.81	2.57
14 Pronotum length	5	3.02-3.12	3.05	5	3.12-3.98	3.57
15 " width	5	4.80-5.56	5.23	4	5.28-6.86	6.09
16 Scutellum length	5	1.90-2.26	2.06	4	1.99-2.56	2.26
17 " width	5	1.88-2.28	2.08	4	2.07-2.51	2.30
18 Hind tibia length	5	8.16-9.88	9.17	5	8.06-10.1	9.27
Tibial dilation:						
19 total width	5	2.20-3.21	2.83	5	2.64-3.74	3.28
external part:						
20 length	5	4.89-6.62	5.80	5	5.32-6.76	6.03
21 width	5	1.29-2.20	1.82	5	1.53-2.49	2.11
internal part:						
22 length	5	3.64-4.32	4.04	5	3.84-4.80	4.35
23 width	5	0.52-0.84	0.72	5	0.76-1.00	0.85
24 Undilated portion	5	2.30-2.64	2.44	5	2.30-2.92	2.51
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.72-6.96:1	6.28:1	5	6.03-7.17:1	6.43:1
1 / 18	5	1.63-2.02:1	1.81:1	5	1.80-2.23:1	2.00:1
2 / 3	5	1.12-1.33:1	1.25:1	5	1.17-1.35:1	1.27:1
6 / 2	5	0.97-1.12:1	1.03:1	5	0.87-0.98:1	0.93:1
10 / 2	5	0.72-0.93:1	0.84:1	5	0.84-0.98:1	0.90:1
9 / 6	5	1.36-1.72:1	1.58:1	4	1.41-1.67:1	1.58:1
15 / 16	5	2.46-2.65:1	2.53:1	3	2.54-2.65:1	2.69:1
20 / 18 %	5	59.1-67.0	63.2	5	56.5-68.4	65.0
22 / 18 %	5	40.8-46.2	44.0	5	45.5-51.2	46.9

Veneza impictipennis Stál, 1870 comb.n

(Plate 61)

Leptoglossus impictipennis: Stál, 1870: 163. Lectotype ♂ Colombia (NR), designated by Allen, 1969: 116 [examined].

Leptoglossus impictipennis Stál: Lethierry & Severin, 1894: 47; Allen, 1969: 116.

General and differential diagnosis: (see discussion on V. neovexillata).

Description: General characters see Allen, 1969: 116.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with very deep rather narrow, wider at the bottom median notch; dorsal prongs acute and rather thick, strongly projecting dorsally and deflected medially from the base; the margin lateral to the dorsal prongs slightly raised and protruding medially (b); inflected portion of posterior margin with a pair of small rounded lateral prominences (a) separated from each other by a shallow quadrate depression; posterior margin slightly below the lateral margins; the latter horizontal and moderately flared. Paramere (fig. C,D) - outer lobe small and rounded; shank thin with prominent median lobe; hook moderately curved almost uniformly thick from base up to the apex, with small medial apical projection. Phallus (fig. E) - conjunctiva with moderately long dorsal sac, similar to that

of V. zonata, except for process 1 raised, wide, with short acute tip; processes 2a-b smaller and less pointed; process 3a without additional lobe, and 3b large and bulging; processes 4a-b slightly sclerotized, both of equal size, conspicuous and strongly projecting; 9a-b with long and acute anterior projection.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of the duct long, slightly widened towards the duct dilation and strongly curved in the middle.

Measurements and Ratios: (see table 62)

Geographical distribution: (Map 23) Known only from the northern part of South America; the available material was collected in Colombia, Venezuela, Guyana, Surinam, French Guiana and Brasil. Allen (1969) also reported it from Bolivia.

Discussion: This species shows considerable variation in the colour pattern of pronotum; in the most generalized condition, the pronotum has the declivous part yellow ochre to vinnaceous rufous; the patch may be entirely or partially divided by a reddish brown narrow band and usually has numerous small black spots; two specimens from Brasil Sta Catarina have no patch on pronotum at all. The same two specimens have a rather shallow emargination on tibial dilation and this condition was also observed in other specimens with the patch on pronotum; the incumbent pubescence on the posterior portion of the corium, mentioned by Allen,

varies from dense pubescence to complete absence of any traces of hairs, with all degrees of intermediate conditions.

Material examined

a) Type material: Lectotype of Leptoglossus impictipennis Stal, from Colombia, Bogotá, labelled "Typus, Bogota, Lindig."

Note: The remaining three ♂ specimens of the syntype series, are as indicated by Allen, specimens of V. zonata.

b) Other material: BRASIL: Mato Grosso, Koslowsky, 1 ♂ (MLP); Mato Grosso, 12°49'S - 51°45'8W, 19 - XI - 1968, W.J. Knight, 1 ♂ (BMNH); Mato Grosso, Zobrys-Wolter, 1 ♀ (MNHU); S. Paulo, 1 ♀ (BMNH); Sta Catarina, 1 ♂, 1 ♀ (IZA). COLOMBIA: Dep. Tolima, Surade Ata, VIII - 1926, Woronov, 1 ♀ (ZI). FRENCH GUIANA: Kourou, April, 1 ♀ (MNHU); Rey, 1909, 1 ♂ (MNHN); Cayene, F. Pillault, 1 ♀ (IRSNB). GUYANA: 1 ♂ (BMNH). SURINAM: Spoorban, 121Km Steenbedryf, 15 - X - 1946, 1 ♀ (RNH). VENEZUELA: Monagas, Jusepín, 21 - IX - 1965, F. Fernández Yépez, C.J. Rosales, 2 ♀ (IZA).

Plate 61

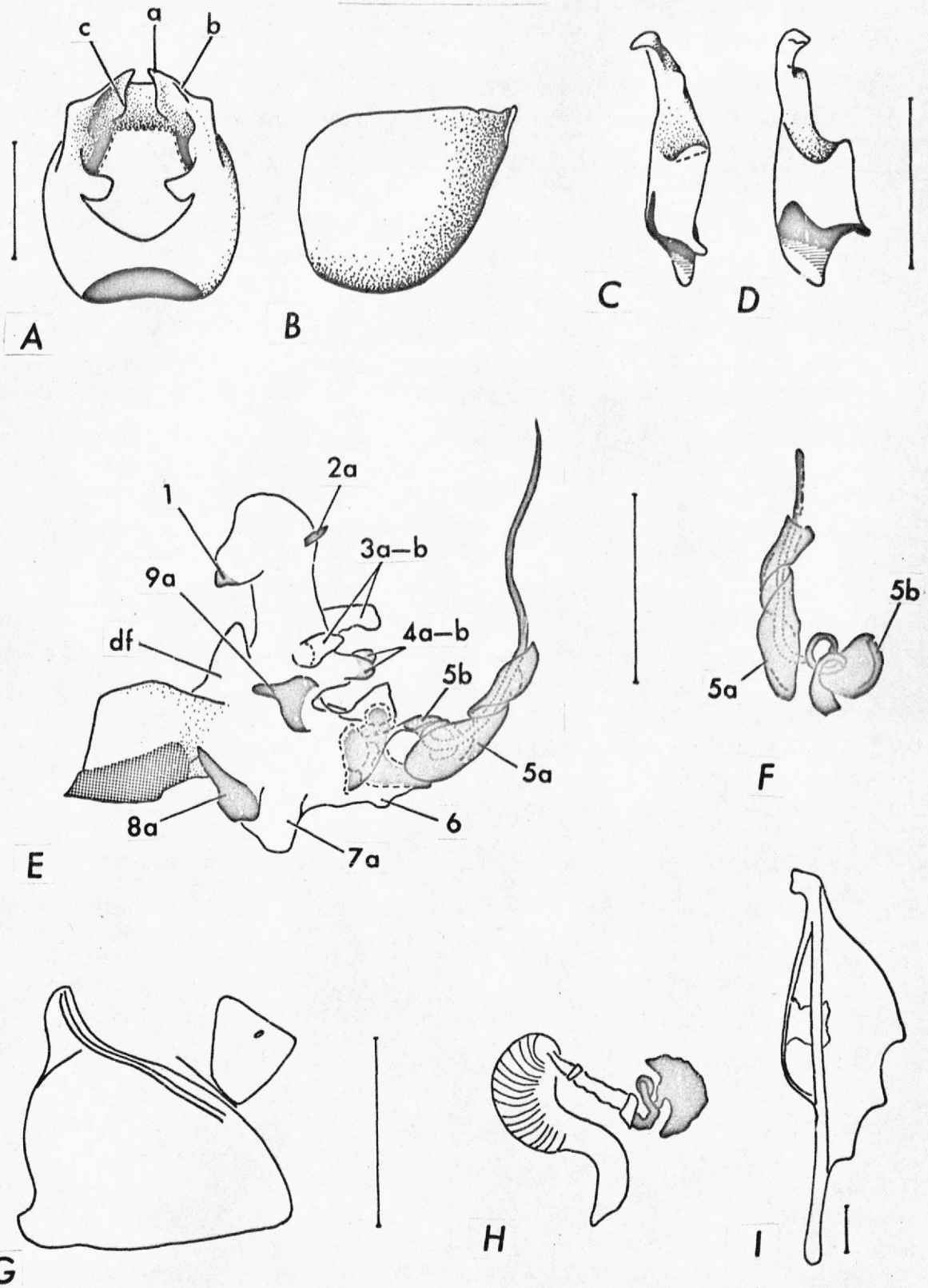


Table 62 Measurements (3 ♂♂ and 2 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	14.0–15.5	14.5	2	14.0	14.0
2 Head length	3	2.26–2.45	2.36	2	2.37–2.47	2.42
3 " width	3	1.76–2.05	1.90	2	1.86–1.93	1.89
Distance:						
4 inter-ocular	3	0.98–1.10	1.04	2	1.10	1.10
5 ante-ocular	3	1.19–1.33	1.25	2	1.25–1.27	1.26
Antennae:						
6 segm. I length	3	2.05–2.66	2.34	2	2.10–2.26	2.18
7 " II "	3	2.97–3.79	3.29	2	3.12–3.40	3.26
8 " III "	3	1.96–2.49	2.20	2	2.06–2.20	2.13
9 " IV "	3	3.31–3.64	3.43	1	3.12	3.12
Labium:						
10 segm. I length	3	1.90–2.09	1.97	2	1.90–2.07	1.98
11 " II "	3	1.90–1.95	1.92	2	1.90–1.93	1.91
12 " III "	3	1.14–1.15	1.14	2	0.95–1.17	1.06
13 " IV "	3	1.52–2.05	1.81	2	1.88–1.90	1.89
14 Pronotum length	3	2.64–2.97	2.75	2	3.12–2.97	3.04
15 " width	3	4.60–5.28	4.94	2	4.60–5.32	4.96
16 Scutellum length	3	1.71–1.99	1.80	2	1.71–1.90	1.80
17 " width	3	1.74–2.07	1.90	2	1.95–2.09	2.02
18 Hind tibia length	2	7.68–8.78	8.23	2	7.00–7.68	7.34
Tibial dilation:						
19 total width	2	2.40–2.59	2.49	2	2.40–2.64	2.52
external part:						
20 length	2	5.18–6.24	5.71	2	5.04–5.37	5.20
21 width	2	1.58–1.72	1.65	2	1.44–1.58	1.51
internal part:						
22 length	2	3.50–3.64	3.57	2	3.45–3.64	3.54
23 width	2	0.52	0.52	2	0.56–0.68	0.62
24 Undilated portion	2	1.68–1.92	1.80	2	1.37–1.68	1.52
Ratios: (figures refer to character numbers above).						
1 / 2	3	5.85–6.32:1	6.14:1	2	5.66–5.90:1	5.78:1
1 / 18	2	1.76–1.82:1	1.76:1	2	1.82–2.00:1	1.90:1
2 / 3	3	1.18–1.35:1	1.24:1	2	1.27:1	1.27:1
6 / 2	3	0.85–1.08:1	0.99:1	2	0.88–0.91:1	0.90:1
10 / 2	3	0.79–0.85:1	0.83:1	2	0.80–0.83:1	0.81:1
9 / 6	3	1.36–1.63:1	1.46:1	1	1.38:1	1.38:1
15 / 16	3	2.65–2.88:1	2.74:1	2	2.42–3.11:1	2.75:1
20 / 18 %	2	67.4–71.0	69.3	2	69.9–72.0	70.8
22 / 18 %	2	41.4–45.5	43.3	2	47.3–49.0	48.2

Veneza concolor (Walker) 1871 comb.n

(Plate 62)

Anisoscelis concolor Walker, 1871: 128.26. Holotype ♀, Mexico (BMNH) [examined, dissected]

Anisoscelis minor Dallas, 1852: 452.2. LECTOTYPE ♀, Colombia (BMNH), here designated [examined, dissected] Syn. n

Anisoscelis minor Dallas: Walker, 1871: 124.2

Theognis minor (Dallas): Stal, 1862: 295.149.

Leptoglossus concolor (Walker): Distant, 1881: 124; Lethierry & Severin, 1894: 47; Distant, 1901b: 430; Allen, 1969: 118.

General and differential diagnosis: Characteristic features of ♂♂: condition of median notch of genital capsule. Those of ♀♀: shape and size of spermatheca. V. concolor shows close relationships with V. stigma, sharing the same colour pattern of the body, absence of processes 2b and process 2a very conspicuous, pointed with membranous base. These two species can be distinguished by different sculpture of calli, thickness of hairs on and around calli, shape of genital capsule and paramere, size of the process 3a, length and thickness of process 5a, size and shape of the duct of spermatheca.

Description: General characters see Allen, 1969: 118.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with the notch deep, very narrow and elongate oval, usually wider below the aperture, but occasionally subrectangular; dorsal prongs absent; the margin between median notch and lateral margin slightly protruding dorsomedially (a); inflected portion of posterior margin with a pair of low and wide lateral prominences (b), separated from each other by a very shallow and narrow concave depression; posterior margin slightly below the level of lateral margins; the latter slightly concave, slightly rising posteriorly and slightly flared. Paramere (fig. C,D) - medial margin of shaft sinuous; outer lobe short, and rounded; shank thick, with straight prominent median lobe, sharply ending at base of the hook; hook strongly curved and short, tapering distally and with small medial apical projection. Phallus (fig. E) - conjunctiva with long uniformly wide dorsal sac, armed with the following processes: process 1 heavily sclerotized stout and elevated with obtuse tip; 2a heavily sclerotized and very pointed, with membranous base; 3a-b membranous, 3b very large and bulging, 3a shorter without additional lobe; 4a-b heavily sclerotized small and well separated; 9a-b heavily sclerotized, very sonopicuous, wide with stout apical projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) elongate, tapering distally, the second convolution comparatively thick with slightly sinuate margin.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of the duct moderately long rather wide and curved; base of the spermatheca wide.

Measurements and Ratios: (see table 63)

Geographical distribution: (Map 22) Distribution range extends over Mexico, Central America, Florida (U.S.A.), Antilles, Colombia, Ecuador, Surinam and north-eastern part of Venezuela.

Habitat and Biology: Adults have been collected throughout the whole year but at least in the northern part of South America it seems to be most common from June to November. During the dissections fully developed eggs were found in ten females from the same locality in Venezuela, two collected in June, August, three in September and four in December; the eggs are subcylindrical with one side flat, length = 1.42mm, width = 1.23mm, height = 0.35mm.

In Venezuela V. concolor has been found feeding on Psidium spp and on fruits of Bixa Orellana L. Most of the records of V. stigma in the literature are in fact referable to V. concolor.

Material examined

a) Type material: Holotype ♀ of Anisoscelis concolor Walker, from Mexico, Oaxaca, labelled "Typus, 26 Anisoscelis concolor, 58.135, Mex. (Oajaca)", in BMNH collection.

Syntype ♀ of Anisoscelis minor Dallas. According to references in the description the original material consisted of three specimens, one from Colombia, one from Brasil and the third with no data of origin; in Dallas' collection in BMNH, only one female labelled "Typus, 2, Anisoscelis minor 342.a" has been found, and this specimen has been designated and

labelled as lectotype of Anisoscelis minor Dallas. The characters of the dissected genitalia of this species showed that it is not a synonym of V. stigma as previously considered but of V. concolor with which it is now formaly synonymized.

b) Other material: ANTILLAS: Jamaica, St. Andrew, Meadow-brook, - IV - 1962. A.W. Wills, 1 ♂ (BMNH); Montserrat Is., 18 - II - 1931, A.D. Torlesse, 1 ♂, 1 ♀ (BMNH); Martinique, L.M. Slohr, 1 ♂ (BMNH); Cuba: - IX - 1874, Gundach 1 ♀ (MNHU); 1 ♂ (MNHU); Sierra de Guane, 9 - VII - 1933, 3 ♂, 1 ♀ (RNH); Sierra Rosario, 4 - 9 - VI - 1963, A. Rangel, 1 ♀ (RNH); Guantanamo, E. le Moult, 2 ♂, 2 ♀ (RNH); Santa Clara, 15 - III - 21 - IV - 1963, H.J. MacGillary, 1 ♂ (RNH); Guasas, 8 - VII - 1933, s.c., 1 ♀ (RNH); A. Dohrn, 1 ♂ (NR); Havana, 1 ♂, 2 ♀, (DEI); Prov. Havana, Sierra Anapo, 14 - VII - 1929, A. Bierig, 1 ♀ (DEI); St. Croix, H. Faye, 2 ♂, 2 ♀ (UZM); Guadalupe, Delauney, 2 ♀ (IRSNB); Trinidad: Orange glove, 13 - XI - 1953, 1 ♂ (RNH). BRITISH HONDURAS: River Sarstoon, Blancaneau, 1 ♂, 1 ♀ (BMNH); Rio Hondo, s.c., 1 ♀ (BMNH). COLOMBIA: Cali, 1 ♀ (BMNH); Penas Blancas, rio Magdalena, 3 - V - 1926, Woronov, 2 ♂ (ZI). COSTA RICA: Rio Reventazon, 30 - IV - 8 - V, Reimoser, 1 ♀ (NM); Piedras Negras, S. Burgderf, 1 ♂, 1 ♀ (MN). ECUADOR: Paramba, 1050m, dry season, - V - 1897, Rosemberg, 2 ♂ (BMNH); s.c., 1 ♀ (BMNH). GUATEMALA: San Gerónimo, C.C. Champion, 2 ♂, 1 ♀ (BMNH); s.d., 1 ♂ (TM); 1 ♂, 1 ♀ (NMP); 1 ♀ (DEI); G. Bruckner, 1 ♀ (MNHU). HONDURAS: San Pedro Sula, 1 ♀ (TM); s.d., 2 ♂ (NM). MEXICO: N. Yucatán, Temax, Gaumer, 1 ♂ (BMNH); Tabasco, Teapa, H.H. Smith, 1 ♂ (BMNH); Tepic, Schuman, 1 ♀ (BMNH); s.d., 1 ♂ (MNHU); Hoege, 1 ♀ (BMNH); 1856m 1 ♀ (MNHN); 1869,

Salle, 2 ♀ (MNHN); 1895, G. Fallou, 2 ♀ (MNHN); Valladolid, Yucatán, Gaumer, 1 ♀ (IRSNB); Salle, 1 ♂, 2 ♀ (NR); Ocotlan, 1 ♂ (TM); 1 ♂, 4 ♀ (NM). PANAMA: Volcan de Chiriqui, 1200-1800m, C.C. Champion, 1 ♂ (BMNH); Bugaba, C.C. Champion, 1 ♀ (BMNH); Chiriqui, 1898, 1 ♀ (MNHN); s.l., 1 ♂, 1 ♀ (NR); s.l., 1 ♀ (TM); D. Standinger, 1 ♂ (ZI). Guadeloupe, Grande Terre, 6 - VI - 1965, D.C. Geyskes, 1 ♂ (RNH). U.S.A.: Florida, Broward Co. near Dania, 12 - VII - 1961, D.W. Richards, 1 ♀ (BMNH). VENEZUELA: Aragua: Maracay, 45m, 14 - IV - 1949, F. Fernández Yépez, 1 ♂ (IZA); El Limón, 450m, 23 - VI - 1965, J & B. Bechyné, 1 ♂ (IZA); Rancho Grande, 1100m, 24 - VII - 1952, Ferd. Kern, 1 ♂ (IZA); Maracay 450m, 8 - VI - 1948, W. Zwun Kowsky, 1 ♂ (IZA); Pozo Diablo near Maracay 500m, 10 - VII - 1963, A. Perez, 1 ♀ (IZA); Rancho Grande 1100m, 10 - II - 1966, A. Fernández Yépez, 1 ♀ (IZA); El Limón, 450m, 18 - VI - 1967, L. Figueroa, 1 ♂ (IZA); Maracay, 11 - VI - 1951, M. Suarez, 1 ♂ (IZA); Barinas: Reserva Forestal Ticoporo, 230m, 3 - 10 - IV - 1966, F. Fernández Yépez, L.J. Joly, 1 ♂ (IZA); Carabobo: El Trompillo, 22 - XII - 1957, F. Fernández Yépez, on Onoto Bixa Orellana L. (fruit), 1 ♂, 7 ♀ (IZA); Merida: 1 ♂, 1 ♀ (NR); Miranda: Guatopo, 420m, 29 - VIII - 1964, F. Fernández Yépez, C.J. Rosales, 1 ♀ (IZA); Los Chorros, 18 - VI - 1950, H. Fontana, 1 ♂ (IZA); Monagas: San Antonio, 0-100m, 17 - X - 1965, F. Fernández Yépez, 1 ♀ (IZA); Caripito, 0-100m, 19 - IX - 1965, F. Fernández Yépez, C.J. Rosales, 1 ♀ (IZA); Zulia: Kasmera, 12 - IV - 1963, P.J. Salinas, M. Gelbes, 3 ♂ (IZA); Maracaibo, 19 - VI - 1959, C.J. Rosales, 1 ♀ (IZA); Mene Grande, 18 - VII - 1963, O. Cedeño on Guaba (fruit), 1 ♂ (SSPA); Kasmera, 23 - IX - 1961, F. Fernández Yépez,

C.J. Rosales, 1 ♀ (IZA); Dist. Federal: Caracas, La Florida, 30 - I - 1943, H. Bollou, on Guaba, 1 ♂, 2 ♀ (IZA); Caracas, 24 - VII - 1950, S. Ghersi, 1 ♀ (IZA); Caracas, 20 - II - 1935, 1 ♂ (IZA); Macuto, 24 - VIII - 1950, E. Labrador, 1 ♀ (IZA); La Guayra, J. Smith, 2 ♂, 3 ♀ (DEI).

c) Material without data: 1 ♂, 2 ♀, labelled "Amer. merid." (UZM); 1 ♂, 1 ♀, labelled "America, Signoret", (NM); 1 ♀ (NM); 1 ♀, labelled "Breddin Coll.", (DEI); 1 ♀ (TM).

Plate 62

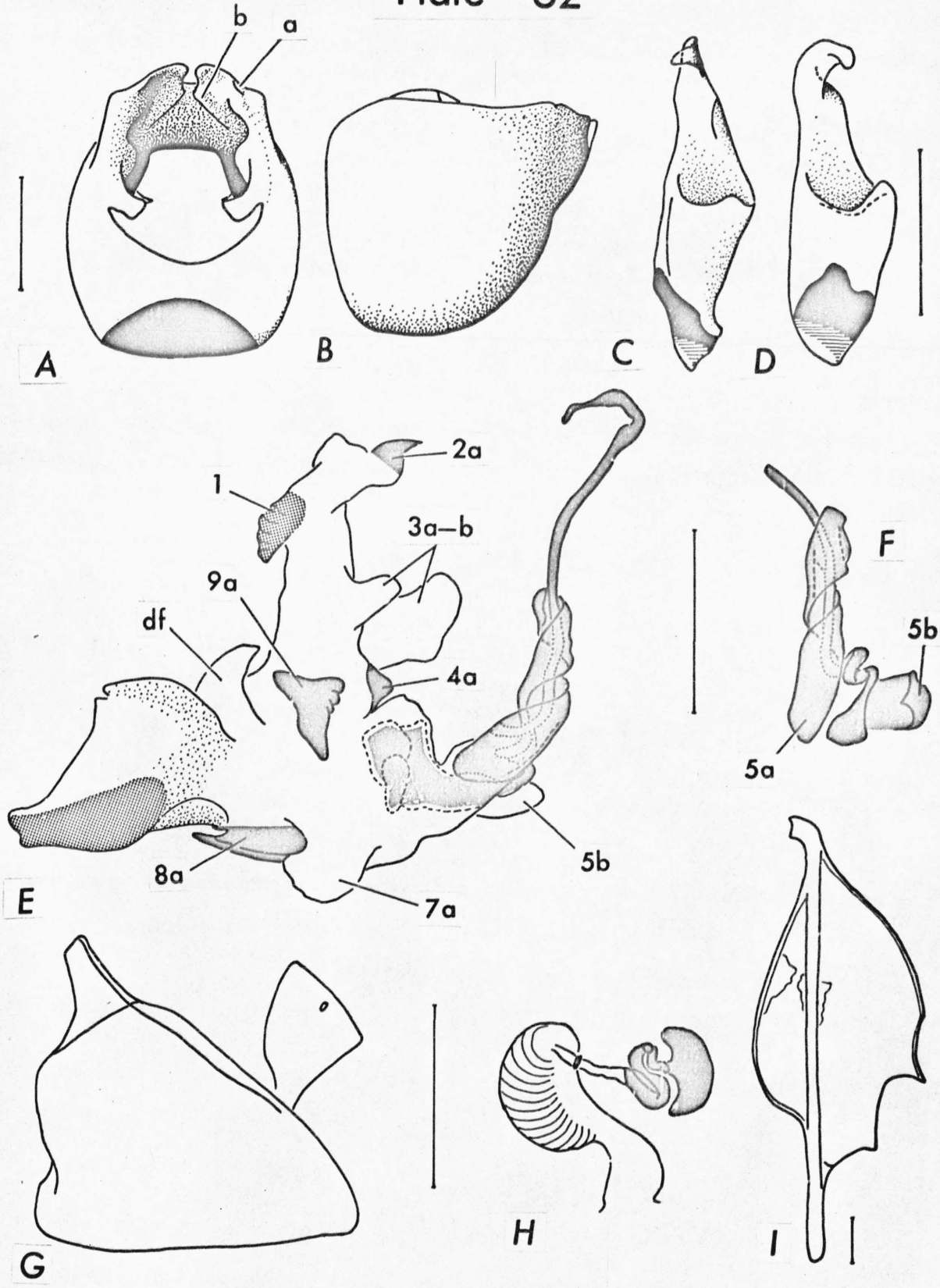


Table 63 Measurements (5 ♂♂ and 5 ♀♀ from 10 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	16.0–19.0	16.9	5	17.0–22.5	19.0
2 Head length	5	2.88–3.42	3.10	5	3.04–3.80	3.40
3 " width	5	2.14–2.43	2.25	5	2.37–2.66	2.48
Distance:						
4 inter-ocular	5	1.14–1.23	1.15	5	1.23–1.40	1.31
5 ante-ocular	5	1.38–1.61	1.44	5	1.53–1.91	1.71
Antennae:						
6 segm. I length	5	2.39–2.92	2.58	5	2.66–3.47	2.95
7 " II "	5	3.55–4.60	3.99	5	4.08–5.56	4.55
8 " III "	5	2.40–3.36	2.79	5	2.83–3.93	3.24
9 " IV "	3	4.80–6.14	5.35	3	5.61–6.48	5.96
Labium:						
10 segm. I length	5	2.85–4.00	3.10	5	3.42–3.83	3.43
11 " II "	5	2.66–3.80	3.03	5	2.85–3.89	3.34
12 " III "	5	1.52–2.47	1.77	5	1.71–2.28	1.88
13 " IV "	5	3.11–5.66	3.83	5	3.32–5.71	4.16
14 Pronotum length	5	2.97–3.60	3.19	4	3.64–4.32	3.96
15 " width	5	4.89–5.42	5.09	5	5.56–7.58	6.45
16 Scutellum length	5	1.91–2.29	2.07	4	2.41–2.88	2.56
17 " width	5	1.90–2.05	2.01	4	2.37–2.85	2.57
18 Hind tibia length	5	6.72–10.3	8.59	4	9.02–12.4	[illegible]
Tibial dilation:						
19 total width	5	2.30–3.64	3.07	4	3.12–4.56	3.95
external part:						
20 length	5	4.51–7.53	5.95	4	6.24–8.92	7.27
21 width	5	1.53–2.44	1.99	4	2.30–2.92	2.67
internal part:						
22 length	5	3.21–5.52	4.27	4	4.41–6.62	5.27
23 width	5	0.52–0.96	0.77	4	0.48–1.34	0.99
24 Undilated portion	5	1.44–1.92	1.72	4	1.77–2.25	1.96
Ratios: (figures refer to character numbers above).						
1 / 2	5	4.95–5.95:1	5.45:1	5	5.11–6.57:1	5.58:1
1 / 18	5	1.84–2.38:1	1.96:1	4	1.80–1.96:1	1.86:1
2 / 3	5	1.28–1.42:1	1.37:1	5	1.28–1.42:1	1.37:1
6 / 2	5	0.79–0.85:1	0.83:1	5	0.80–0.94:1	0.86:1
10 / 2	5	0.83–1.16:1	1.00:1	5	0.96–1.05:1	1.00:1
9 / 6	3	1.87–2.10:1	1.99:1	3	1.86–1.96:1	1.91:1
15 / 16	5	2.33–2.65:1	2.45:1	4	2.52–2.68:1	2.51:1
20 / 18 %	5	65.2–71.3	69.2	4	69.1–72.2	71.2
22 / 18 %	5	46.8–53.5	83.8	4	48.8–53.3	51.6

Veneza stigma (Herbst), 1784 comb.n

(Plate 63)

Cimex stigma 1784: 258. 11, pl. 39. fig. 1. NEOTYPE ♂, Surinam (RNH), here designated [examined]

Hypsclonotus scriptus Hahn, 1826: 5..Holotype Brasil. Synonymyzed by Stål, 1870: 163. 10.

Anisoscelis scripta (Hahn): Westwood, 1842: 16; Dallas, 1852: 452,1; Walker, 1871: 124.1.

Anisoscelis indocta Westwood, 1842: 16. Holotype ♂, Guyana (UM). Synonymized by Stål, 1870: 163. 10.[examined].

Anisoscelis serrulatus Herrich-Schaeffer, 1844: 11, fig. 687-688. 2 syntypes, South America (lost).

Anisoscelis serrulatus H.- S.: Guérin-Méneville, 1857:386.

Theognis scriptus (Hahn): Mayr, 1866: 101.

Leptoglossus stigma (Herbst): Stål, 1870: 163.10;Lethierry & Severin, 1894: 49; Allen, 1969: 120.

General and differential diagnosis: Characteristic features of ♂♂ : outer lobe of paramere very small almost obsolete; shank bend medially. Those of ♀♀ : shape and size of spermatheca. For differences with V. concolor, the most closely related species see discussion on the latter.

Description: General characters see Allen, 1969: 120.

Male genitalia: Genital capsule (figs. A,B) - posterior margin with very deep and wide rounded notch; dorsal prongs (a)

rather wide with rounded tips, strongly projecting dorso-posteriorly, and slightly deflected medially; the margin lateral to dorsal prongs projecting dorso-medially (b); inflected portion of posterior margin with a pair of elongate rounded lateral prominences (c), separated from each other by a flat wide area. Paramere (figs. C,D) - medial margin of shaft strongly depressed at base of shank; outer lobe very small, sometimes rudimentary; shank thick, inclined medially, with wide rounded median lobe; hook strongly curved, short tapering distally, with a small medial apical projection. Phallus (fig. E) similar to that of V. concolor except for slightly longer dorsal sac, larger process 2a, process 5a (fig.E,F) comparitively narrow and longer, and the second convolution uniformly narrow.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation; tubular part of the duct strongly curved, long and narrow, gradually wider towards the base.

Measurements and Ratios: (see table 64).

Geographical distribution: (Map 22) The known distribution range of this species is confined to South America, namely: southern and eastern part of Venezuela, Guyana, Surinam, French Guiana, Brasil, Ecuador, Bolivia, Paraguay and Argentina.

Habitat and Biology: Collection data indicate that adults are present throughout the whole year but seem to be more frequent

between June and September. During the dissections nine females were found with developed eggs, but only one, from Paraguay is known to have been collected in February; the eggs are subcylindrical with one side flat, length 1.71 mm, width 1.25, height 1.04 mm.

V. stigma has been reported in Brasil as feeding on Citrus, Cucurbita pepo, Psidium sp, Anacardium occidentale, Averrhoa carambola, Manguifera indica (Araujo, 1967),

Material examined

a) Type material. Neotype ♂ of Cimex stigma Herbst. The type of this species was supposed to be preserved in MNHU but in spite of the help of Dr. Göllner-Scheiding it was not found in this collection. This species is very closely related with V. concolor and frequently both species have been confused. These two species can be distinguished only by some characters of male and female genitalia. Allen (1969) referred to V. stigma all specimens with dorsal prongs on posterior margin of the genital capsule and to V. concolor the specimens with rectangular notch on the capsule; the females can be recognised by the shape of the spermatheca: the holotype ♀ of V. concolor has the spermathecal duct moderatelly long and rather wide, associated with a rather thick process 5a (fig. E.F) of the conjunctiva of males; V. stigma has the spermathecal duct noticeably longer and narrow, associated with long and rather narrow process 5a (fig. E,F) in males. In the interest of stability of nomenclature, a

designation of a neotype is advisable for Cimex stigma, and in the course of this study a ♂ from Surinam, Paramaribo, Clevia, 3-V-1963, P.H.v. Doesburg Jr. in (RNH) was chosen as neotype and accordingly labelled. This specimen fully agrees with Herbst original description and illustration.

Holotype of Anisoscelis indocta Westwood from Guyana, Demerara, labelled "Hem. 329, Anisoscelis indocta Westwood, Dem." in U.M.

b) Other material: ARGENTINA: Missiones, Pto. Bemberg, II-1942, 1♂, 2♀(MLP); El Dorado, IV-1936, 1♀(MLP). BOLIVIA: J. Steinbach, 1♀(BMNH). BRASIL: 1895, G. Fallou, 1♀(MNHN); Bahia, 1913, P.Serre, 2♂, 2♀(MNHN); Pernambuco, Pery-Pery, 1898, Gounelle, 1♀(MNHN); 1852, 1♂(MNHN); Amazonas, Deyrolle, 2♂, 1♀(NR); 2♂, 2♀(NR); Amazon, Fondeboa, 3♂, 1♀(NR); Amazon sup; Olivenca, 1♀(NR); Amazon sup., Teffé, 1♀(NR); Manaos, Roman, 1♂, 1♀(NR); 2♀(UZM); Rio de Janeiro, 1♀(UZM); 3♂, 5♀NM); Schott, 3♂, 1♀(NM); Amazonas, Taperinha, Santarem, 21-31-VII-1927, Zerny, 4♂(NM); s.l., C. Hagmann, 3♀(NM); Sta. Tiaia, Est, Rio, -X-1949, W. Zikan, 1♀(DEI); Manaos, R. Fischer, 1♀(DEI); Rio de Janeiro, Itatiaya, 1♂(MN); Hisingi, 1♂(ZMU); Nicheroy, 19-I-1925, Koezbauer, 1♂(ZMU); Sao Paulo, Piracicaba, Bondar, 3♂, 3♀(ZI); Bangu, Rio D.F., VII-1943, 1♂(NMP);Rio de Janeiro, 1930, 1♂(TM); Obidos, 2-II-1896, 2♂(BMNH); Botafogo, 1♂(IRSNB); 1♂(IRSNB); Pará, 1869. Janson, 1♂, 1♀(IRSNB); 1♀(BMNH); Prov. Goyas. 1♀(BMNH); Santarem E. le Moult, 14♂, 10♀(RNH); s.d., 1♂, 1♀(IZA);

Montagnes des Orgues, Prov. Rio de Janeiro, Tijuca, E.R. Wagner, 1902, 3 ♀ (MNHN). ECUADOR: Rio Napo, R. Blomberg, 1 ♂ (NR). FRENCH GUIANA: 1899, R. Oberthür, 3 ♀ (MNHN); St. Jean du Maroni, 1914, R. Benoist, 1 ♂ (MNHN); Cayene, 1 ♂ (MNHN); 2 ♀ (IRSNB); St. Laurent du Maroni, Le Moult, 1 ♂ (ZMU); 1 ♀ (TM); Cayene, 1 ♀ (BMNH); Quanary, 1900, F. Geay, 1 ♂, 1 ♀ (MNHN); Roches de Kourou, E. le Moult, 1 ♀ (RNH); Cayene, 1♀(MNHU). GUYANA: A.W. Bartlett, 2 ♂, 1 ♀ (BMNH). PARAGUAY: Molinos, - II-1925, F. Schade, 1 ♂ (ZMU); Villa Rica, 22-II-1925, s.c., 1 ♀ (ZMU); Pta. Bertoni, Alta Pacana, 16-XI-1914, Tanaceum, 1 ♀ (ZI); Vezenyi, 1 ♂, 3 ♀ (TM); Sapucay, 1964, W. Foster, 1 ♀ (BMNH). PERU: Iquitos San Roque, April, E. le Moult, 1 ♂ (RNH). SURINAM: St. Laurent, C. Heller, 1 ♀ (MNHU); P.H.v. Doesburg, 4 ♂, 2 ♀ (RNH); Paramaribo, 1958, s.c., 1 ♀ (RNH), s.l., 1959, s.c., 1 ♂ (RNH); s.l., 1960, s.c., 1♂♀ (RNH), Paramaribo, Clevia, 3-V-1963, s.c., 1 ♂ (RNH); near Avanavera Falls, Kabalebo River, 1 ♂ -IX-1965, G.F. Mees, 1 ♂ (RNH); Albina, 28-V-1963, P.H.v. Doesburg, 1 ♂ (RNH); Paramaribo, VII-1957, s.c., 2 ♀ (RNH); Paramaribo, 12-X-1964, D.C. Geyskes 1 ♂, 1 ♀ (RNH); 1 ♂ (RNH). VENEZUELA: Monagas: Jusepín. 10-VIII-1966. F. Fernández Yépez, C.J. Rosales, 1 ♂ (IZA); s.l., 7-VIII-1968, s.c. 1 ♀ (IZA); s.l., 17-IX-1968, s.c., 1 ♀ (IZA); Dist. Federal: Caracas, 1 ♂ (UZM); Terr. Fed. Amazonas: Yavita.-VII-1952, J.R. Guzmán, 1 ♂ (IZA);

c) Material without data: 1 ♂, labelled "Coll. Misinger, (ZMU); 3 ♀, labelled "Breddin Coll." (DEI); 4 ♀, (MNHU); 1 ♂, labelled "340c", (BMNH); 1 ♂, 2 ♀, labelled "Fry Coll., 1905-100", (BMNH).

Plate 63

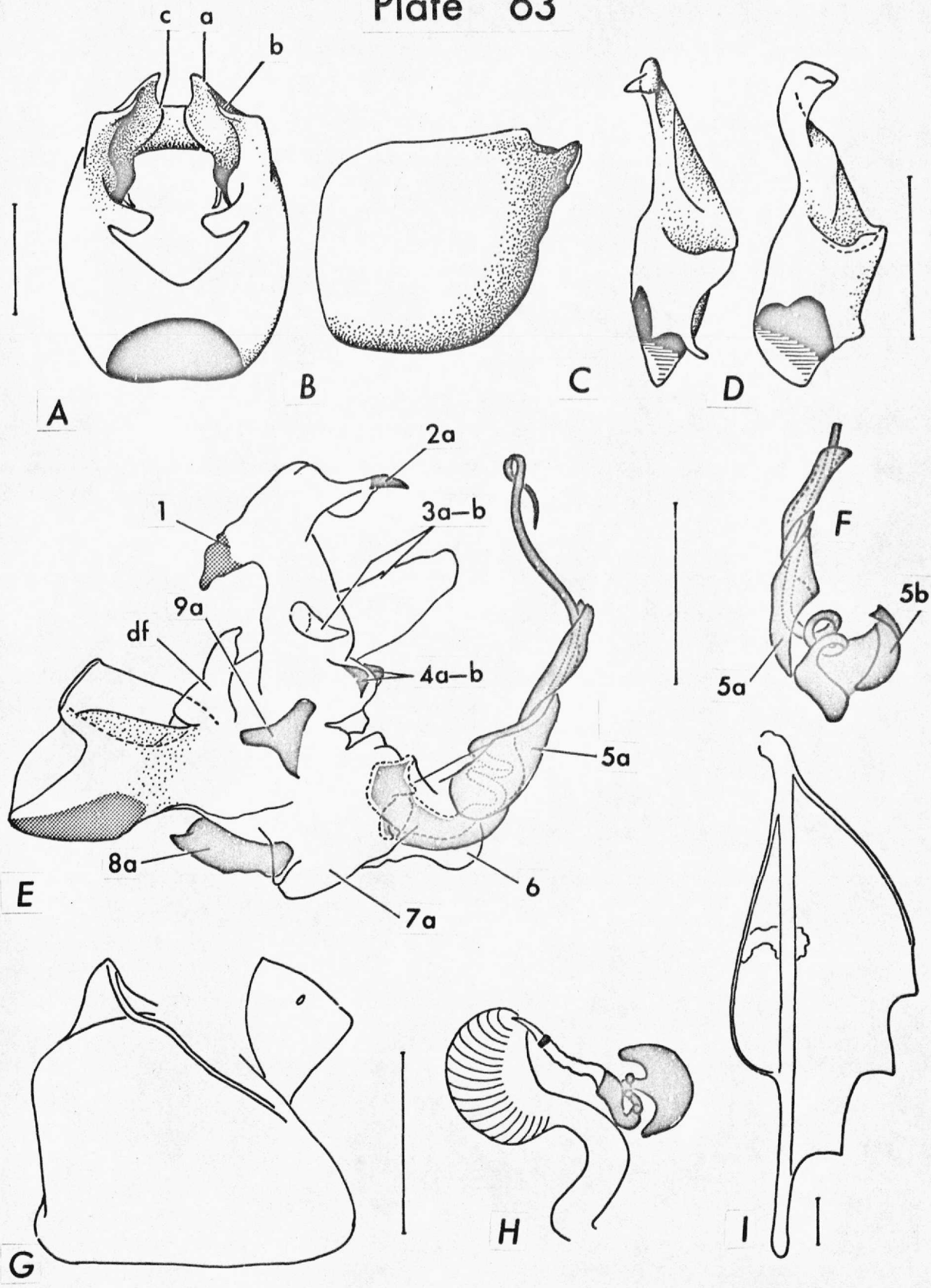


Table 64 Measurements (5 ♂♂ and 5 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	5	15.0–18.5	16.8	5	18.0–21.5	19.4
2 Head length	5	2.75–3.23	3.00	5	3.23–3.57	3.34
3 " width	5	2.16–2.37	2.25	5	2.31–2.58	2.41
Distance:						
4 inter-ocular	5	1.14–1.23	1.19	5	1.21–1.42	1.28
5 ante-ocular	5	1.31–1.61	1.46	5	1.52–1.88	1.69
Antennae:						
6 segm. I length	5	2.28–3.04	2.69	5	2.56–3.04	2.79
7 " II "	5	3.36–4.70	4.10	5	3.98–4.80	4.38
8 " III "	5	2.54–3.12	2.88	4	2.97–3.36	3.20
9 " IV "	4	4.22–5.85	5.22	4	5.18–5.95	5.54
Labium:						
10 segm. I length	5	2.56–3.23	2.93	5	3.04–3.42	3.26
11 " II "	5	2.47–3.23	2.88	5	3.00–3.26	3.11
12 " III "	5	1.33–1.61	1.46	5	1.42–1.63	1.52
13 " IV "	5	3.00–3.68	3.25	5	2.94–3.34	3.19
14 Pronotum length	5	2.92–3.84	3.31	5	3.36–4.32	3.93
15 " width	5	5.04–6.29	5.71	4	6.38–7.87	7.01
16 Scutellum length	5	1.90–2.37	2.20	5	2.33–2.85	2.57
17 " width	5	1.88–2.28	2.17	5	2.37–2.75	2.52
18 Hind tibia length	5	7.87–10.9	9.46	5	9.60–12.0	10.5
Tibial dilation:						
19 total width	5	2.88–4.17	3.44	5	3.88–4.56	4.20
external part:						
20 length	5	5.76–7.68	6.72	5	6.81–8.64	7.60
21 width	5	1.96–2.88	2.28	5	2.54–2.92	2.71
internal part:						
22 length	5	3.84–5.28	4.64	5	4.80–6.24	5.43
23 width	5	0.72–1.05	0.85	5	1.00–1.29	1.17
24 Undilated portion	5	1.29–2.54	1.90	5	1.48–2.20	2.26
Ratios: (figures refer to character numbers above).						
1 / 2	5	5.41–5.72:1	5.60:1	5	5.57–6.02:1	5.80:1
1 / 18	5	1.60–1.96:1	1.77:1	5	1.78–1.97:1	1.84:1
2 / 3	5	1.30–1.49:1	1.33:1	5	1.36–1.39:1	1.38:1
6 / 2	5	0.82–0.94:1	0.89:1	5	0.79–0.88:1	0.83:1
10 / 2	5	0.85–1.11:1	0.97:1	5	0.94–1.02:1	0.97:1
9 / 6	4	1.82–1.98:1	1.91:1	4	1.89–2.06:1	1.96:1
15 / 16	5	2.33–2.72:1	2.59:1	4	2.62–2.76:1	2.69:1
20 / 18 %	5	68.5–73.8	71.0	5	70.9–75.0	72.3
22 / 18 %	5	46.6–51.0	49.0	5	50.0–55.0	51.7

Veneza lonchoides Allen 1969 comb.n

(Plate 64)

Leptoglossus lonchoides Allen, 1969: 124. Holotype ♂ Brasil, (USNM) [examined]

General and differential diagnosis: Pronotum moderately declivent; humeral areas not expanded or ascending; tibial dilation narrow and buceolate. The condition of the genital capsule, paramere and phallus indicate that V. lonchoides is more related to the group of species consisting of V. conspersa, V. aucta, V. zonata and V. opposita than to any other species of the genus, although the general external appearance of V. lonchoides is quite distinctive with no resemblance to any species of the genus.

Description: General characters see Allen, 1969: 124.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep rounded median notch; dorsal prongs (a) apically rounded, well projecting postero-dorsally and medially deflected; the margin lateral to dorsal prongs slightly curved (b); inflected portion of posterior margin with a pair of very low lateral prominences (c); posterior margin slightly below the lateral margins; the latter gradually ascending posteriorly and flared. Paramere (fig. C,D) - outer lobe large, thick

and obtuse; shank thick without median lobe; hook thick and curved, tapering distally with small medial apical projection. Phallus (fig. E) - conjunctiva with long dorsal sac, armed with the following processes: 1 heavily sclerotized, wide and long, not appressed; 2a-b heavily sclerotized, both sharply pointed, 2a longer than 2b; 3a-b membranous, 3b elongate and very conspicuous, tapering distally, 3a thinner and smaller than 3b, with an additional medial-proximal weakly sclerotized lobe (d); 4a-b heavily sclerotized, very conspicuous and very close to each other, 4b larger than 4a; 9a-b heavily sclerotized, very conspicuous, very wide, with broad truncate anterior projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) long and tapering distally, second convolution large and uniformly wide.

Female genitalia: Ist gonocoxa and VIIIth latero tergite as shown in fig. G; spermatheca (fig. H) with large ovoidal duct dilation; tubular part of the duct long and narrow, widening near base.

Measurements and Ratios: (see table 65)

Geographical distribution: (Map 23) Only known from Brasil and Peru.

Material examined

Type material: Holotype ♂ of Leptoglossus lonchoides Allen, from Brasil, Nova Teutonia, Santa Catarina, - VI - 1943, F. Plaumann; in USNM (Type No. 70226). Paratypes: BRASIL: Amazonas, Manaos, Uyapiranga, Rio Negro, 14km from Manaos, 81m, 15 - XI - 15 - XII - 1941, A. Rabaut, 1 ♂ (AM). PERU: Rio Santiago, 2 - 3 0 XI - 1924, H. Bassler, 1 ♀ (AM).

Plate 64

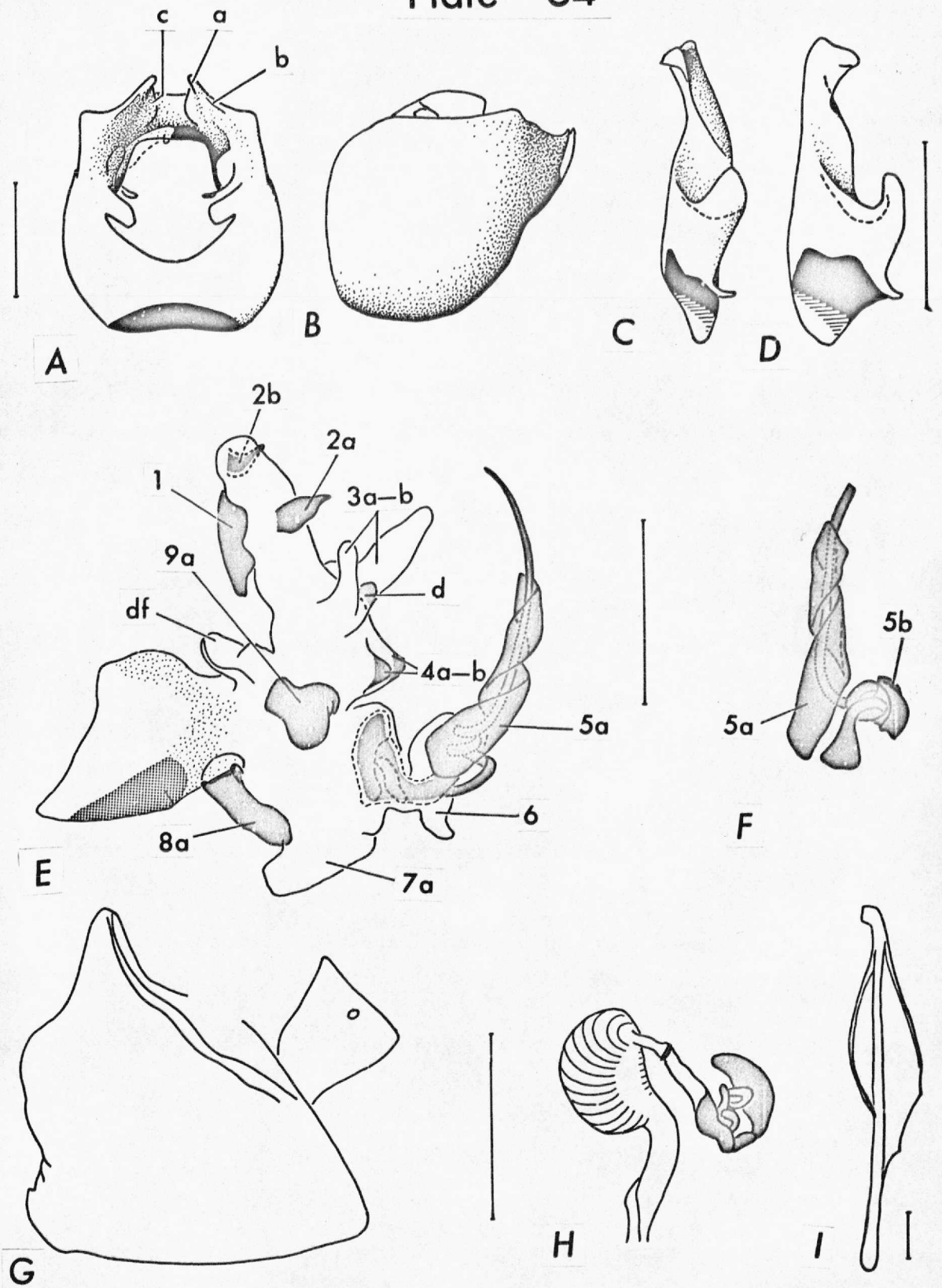


Table 65 Measurements (1 ♂ and 1 ♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	17.5	17.5	1	19.2	19.2
2 Head length	1	2.71	2.71	1	2.75	2.75
3 " width	1	2.14	2.14	1	2.26	2.26
Distance:						
4 inter-ocular	1	1.14	1.14	1	1.31	1.31
5 ante-ocular	1	1.34	1.34	1	1.48	1.48
Antennae:						
6 segm. I length	1	2.85	2.85	1	3.04	3.04
7 " II "	1	4.17	4.17	1	4.32	4.32
8 " III "	1	3.07	3.07	1	3.40	3.40
9 " IV "	1	4.51	4.51	1	4.70	4.70
Labium:						
10 segm. I length	1	2.58	2.58	1	2.77	2.77
11 " II "	1	2.33	2.33	1	2.66	2.66
12 " III "	1	1.19	1.19	1	1.33	1.33
13 " IV "	1	2.69	2.69	1	2.56	2.56
14 Pronotum length	1	3.50	3.50	1	3.84	3.84
15 " width	1	4.65	4.65	1	5.37	5.37
16 Scutellum length	1	2.05	2.05	1	2.33	2.33
17 " width	1	1.90	1.90	1	2.16	2.16
18 Hind tibia length	1	8.29	8.29	1	8.49	8.49
Tibial dilation:						
19 total width	1	1.58	1.58	1	1.44	1.44
external part:						
20 length	1	4.89	4.89	1	4.80	4.80
21 width	1	0.76	0.76	1	0.62	0.62
internal part:						
22 length	1	3.50	3.50	1	3.36	3.36
23 width	1	0.48	0.48	1	0.48	0.48
24 Undilated portion	1	2.40	2.40	1	2.40	2.40
Ratios: (figures refer to character numbers above).						
1 / 2	1	6.45:1	6.45:1	1	6.98:1	6.98:1
1 / 18	1	2.11:1	2.11:1	1	2.26:1	2.26:1
2 / 3	1	1.26:1	1.26:1	1	1.21:1	1.21:1
6 / 2	1	1.05:1	1.05:1	1	1.10:1	1.10:1
10 / 2	1	0.95:1	0.95:1	1	1.00:1	1.00:1
9 / 6	1	1.58:1	1.58:1	1	1.54:1	1.54:1
15 / 16	1	2.26:1	2.26:1	1	2.30:1	2.30:1
20 / 18 %	1	58.9	58.9	1	56.5	56.5
22 / 18 %	1	42.2	42.2	1	39.5	39.5

Veneza pallidivenosa (Allen) 1969 comb.n

(Plate 65)

Leptoglossus pallidivenosus Allen, 1969: 128. Holotype ♂ Panamá, Canal Zone, Barro Colorado Island, 2 - V - 1956, taken at light, C.W. & M.E. Rettenmeyer (University of Kansas, Snow collection).

General and differential diagnosis: In addition to the characters mentioned by Allen (1969) the shape and size of tibial dilation and the shape of process 5a are also characteristic. For differences between its most closely related species V. humeralis see discussion in that species.

Description: General characters see Allen, 1969: 128, fig. 4.

Male genitalia: Genital capsule (figs. A,B) - posterior margin with deep rounded notch; dorsal prongs absent; inflected portion of posterior margin with a pair of conspicuous obtuse lateral prominences (a), separated from each other by a narrow subquadrate suture; posterior margin well below the lateral margins; the latter, slightly ascending posteriorly, not flared. Paramere (figs. C,D) - outer lobe very small, rudimentary; shank thick without median lobe; hook wide and blunt, strongly curved with small medial subapical projection. Phallus (fig. E) - conjunctiva with long dorsal sac, which has the right side of its apex above the level of the left one; conjunctiva similar to that of V. humeralis except for

process 1 moderately sclerotized, appressed with blunt tip; processes 2a-b not at the same level, 2b above 2a; processes 3a-b better developed, 3a long with rounded sclerotized tip, and with additional membranous postero-medial lobe (b); processes 4a-b moderately sclerotized; processes 9a-b more conspicuous, with truncate projection; conjunctival membrane between processes 4a-b and 9a-b moderately sclerotized; process 5a (fig. E,F) narrow.

Female genitalia: No female specimens were available for study.

Measurements and Ratios: (see table 66)

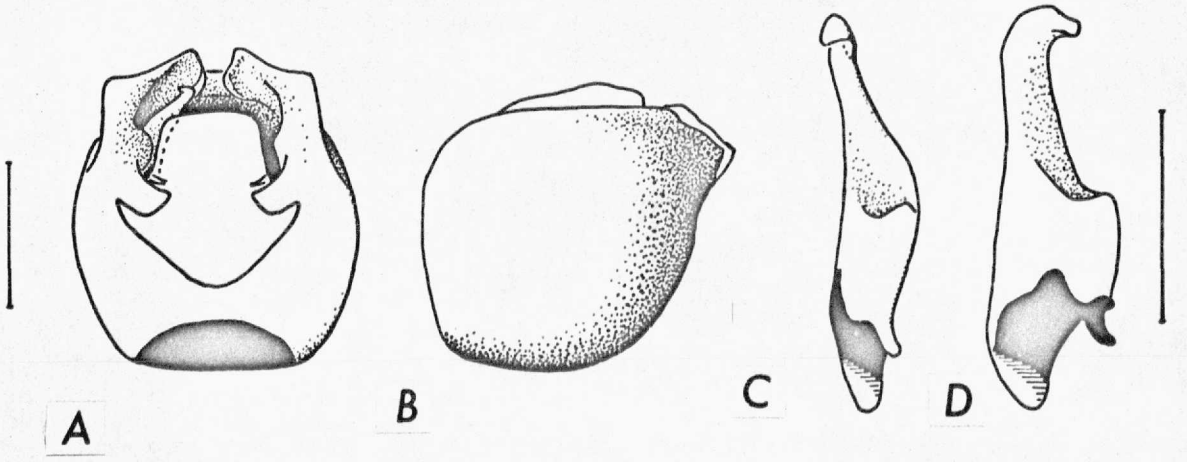
Geographical distribution: (Map 24) Only known from the type locality Panama.

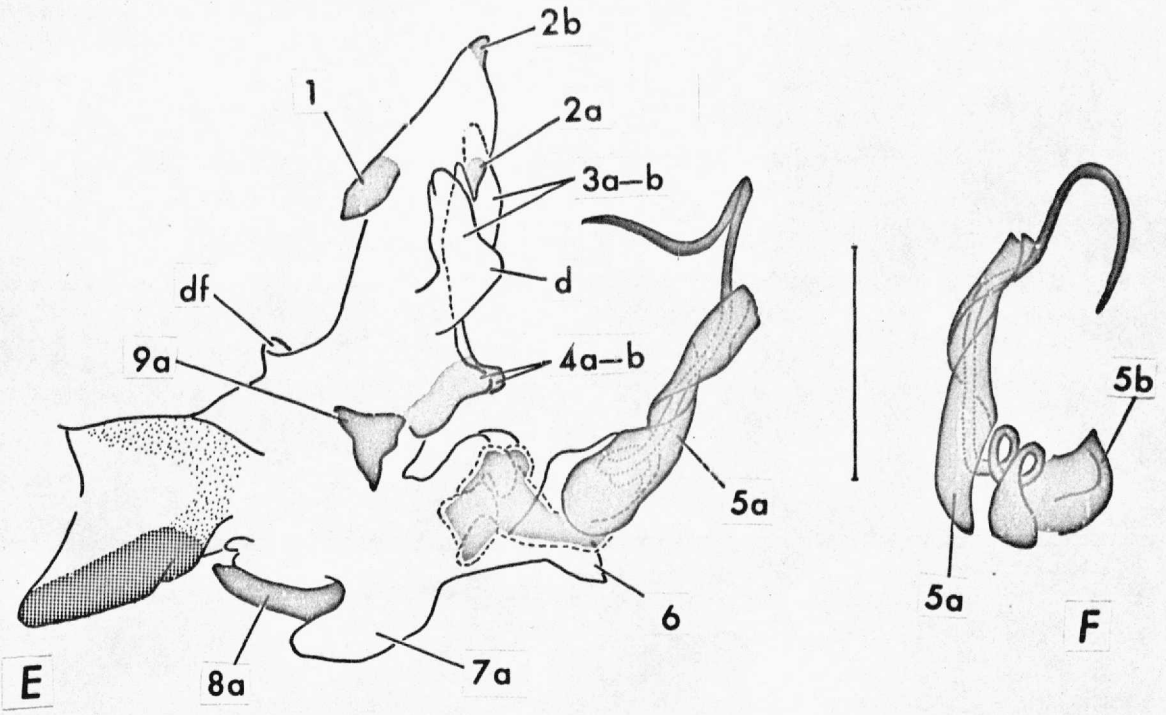
Habitat and Biology: One male was found with an egg of Tachinid (Diptera) possibly Trichopoda pennipes Fabr. deposited on the IInd sternite.

Material examined

Type material: Paratypes: 3 ♂♂ from Panama, Canal Zone, Barro Colorado Island, 28 - IV - 2 - V - 1956, C.W. & M.E. Rettenmeyer in UK collection.

Plate 65





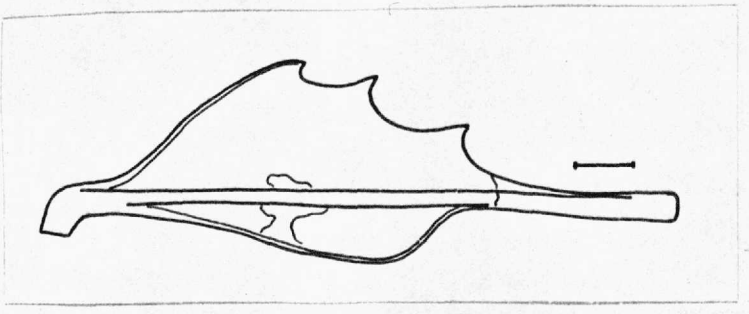


Table 66 Measurements (3 ♂♂ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	17.0-20.0	18.5	-	—	—
2 Head length	3	2.71-3.09	2.83	-	—	—
3 " width	3	2.16-2.39	2.26	-	—	—
Distance:						
4 inter-ocular	3	1.15-1.21	1.17	-	—	—
5 ante-ocular	3	1.36-1.55	1.44	-	—	—
Antennae:						
6 segm. I length	3	2.62-3.13	2.79	-	—	—
7 " II "	3	3.64-4.99	4.15	-	—	—
8 " III "	3	2.68-3.60	3.02	-	—	—
9 " IV "	2	4.12-4.41	4.26	-	—	—
Labium:						
10 segm. I length	3	2.33-2.75	2.49	-	—	—
11 " II "	3	2.29-2.66	2.44	-	—	—
12 " III "	3	1.14-1.33	1.20	-	—	—
13 " IV "	3	2.28-3.04	2.53	-	—	—
14 Pronotum length	3	3.36-3.64	3.53	-	—	—
15 " width	3	6.14-7.96	6.95	-	—	—
16 Scutellum length	3	2.05-2.47	2.27	-	—	—
17 " width	3	2.09-2.39	2.25	-	—	—
18 Hind tibia length	3	8.06-11.1	9.25	-	—	—
Tibial dilation:						
19 total width	3	2.54-3.74	2.98	-	—	—
external part:						
20 length	3	5.28-7.00	6.01	-	—	—
21 width	3	1.48-2.30	1.74	-	—	—
internal part:						
22 length	3	4.32-5.85	4.83	-	—	—
23 width	3	0.76-1.00	0.84	-	—	—
24 Undilated portion	3	1.92-2.97	2.35	-	—	—
Ratios: (figures refer to character numbers above).						
1 / 2	3	6.27-6.86:1	6.53:1	-	—	—
1 / 18	3	1.80-2.16:1	2.00:1	-	—	—
2 / 3	3	1.20-1.29:1	1.17:1	-	—	—
6 / 2	3	0.96-1.01:1	0.98:1	-	—	—
10 / 2	3	0.85-0.88:1	0.87:1	-	—	—
9 / 6	2	1.57-1.68:1	1.62:1	-	—	—
15 / 16	3	2.92-3.22:1	3.06:1	-	—	—
20 / 18 %	3	63.0-67.0	64.9	-	—	—
22 / 18 %	3	50.2-53.5	52.2	-	—	—

Veneza humeralis (Allen) 1969 comb.n

(Plate 66)

Leptoglossus humeralis Allen, 1969: 126. Holotype ♀, Guyana (CM). [examined, dissected].

General and differential diagnosis: In addition to the characters mentioned by Allen, 1969, the following are characteristic: genital capsule short and high, paramere without outer lobe and distal cavity, condition of processes 3a-b and 5a, and the shape and size of spermatheca. V. humeralis shows some relationships with V. pallidivenosa, sharing with it humeral areas produced as a broad long tapering lateral process, and genital capsule with no dorsal prongs. The two species differ in several characters such as: condition of outer lobe of paramere, processes 3a, 4a-b, 5a and size and shape of tibial dilation.

Description: General characters see Allen, 1969: 126.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep widely open median notch; dorsal prongs absent; inflected portion of posterior margin with a pair of rounded lateral prominences (a), separated from each other by a rather narrow quadrate suture; posterior margin well below the lateral margins; the latter rapidly rising posteriorly, not flared. Paramere (fig. C,D) - outer lobe obsolete; shank thick,

deflected medially, without median lobe; hook wide and blunt, strongly curved, with small medial apical projection. Phallus (fig. E): conjunctiva with long uniformly wide dorsal sac, with right side of the apex above the left one; conjunctiva armed with the following processes: 1, heavily sclerotized, stout with obtuse tip; 2a-b level, 2a heavily sclerotized and very conspicuous with pointed tip, 2b very small and rudimentary; 3a-b membranous, 3b elongate, tapering distally, with weakly sclerotized tip, and 3a smaller and very thin, gradually tapering to a weakly sclerotized tip and proximally with an additional weakly sclerotized medial lobe (b); 4a weakly sclerotized, not prominent, 4b membranous and very small, almost obsolete; 9a-b moderately sclerotized, conspicuous, rounded with small stout tip; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) thick, second convolution strongly coiled, ventral margin with small projection.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation, tubular part of the duct moderately long and curved, very wide at base and gradually tapering towards the duct dilation.

Measurements and Ratios: (see table 67)

Geographical distribution: (Map 24) Only known from the northern half of South America, the material available was collected in Venezuela, Guyana, Surinam, French Guiana and Brasil.

Material examined

a) Type material: Holotype ♀ of Leptoglossus humeralis Allen, from Guyana, Kartabo, - VIII - 1925, S.H. Williams in CM collection.

b) Other material: BRASIL: de Lacerda 1 ♀ (IRSNB); Bahia, s.c., 1 ♀ (IRSNB). PANAMA: Panama Bay, 15 - 16 - V - 1952, Galathea Exp. 1950-52, 2 ♂, 2 ♀ (UZM). SURINAM: Groningen, 19 - III - 1962, Bhola, on Citrus at night, 1 ♀ (RNH). VENEZUELA: Monagas, Jusepín, 28 - IX - 1965, F. Fernández Yépez, C.J. Rosales, 1 ♂, 1 ♀ (IZA).

Plate 66

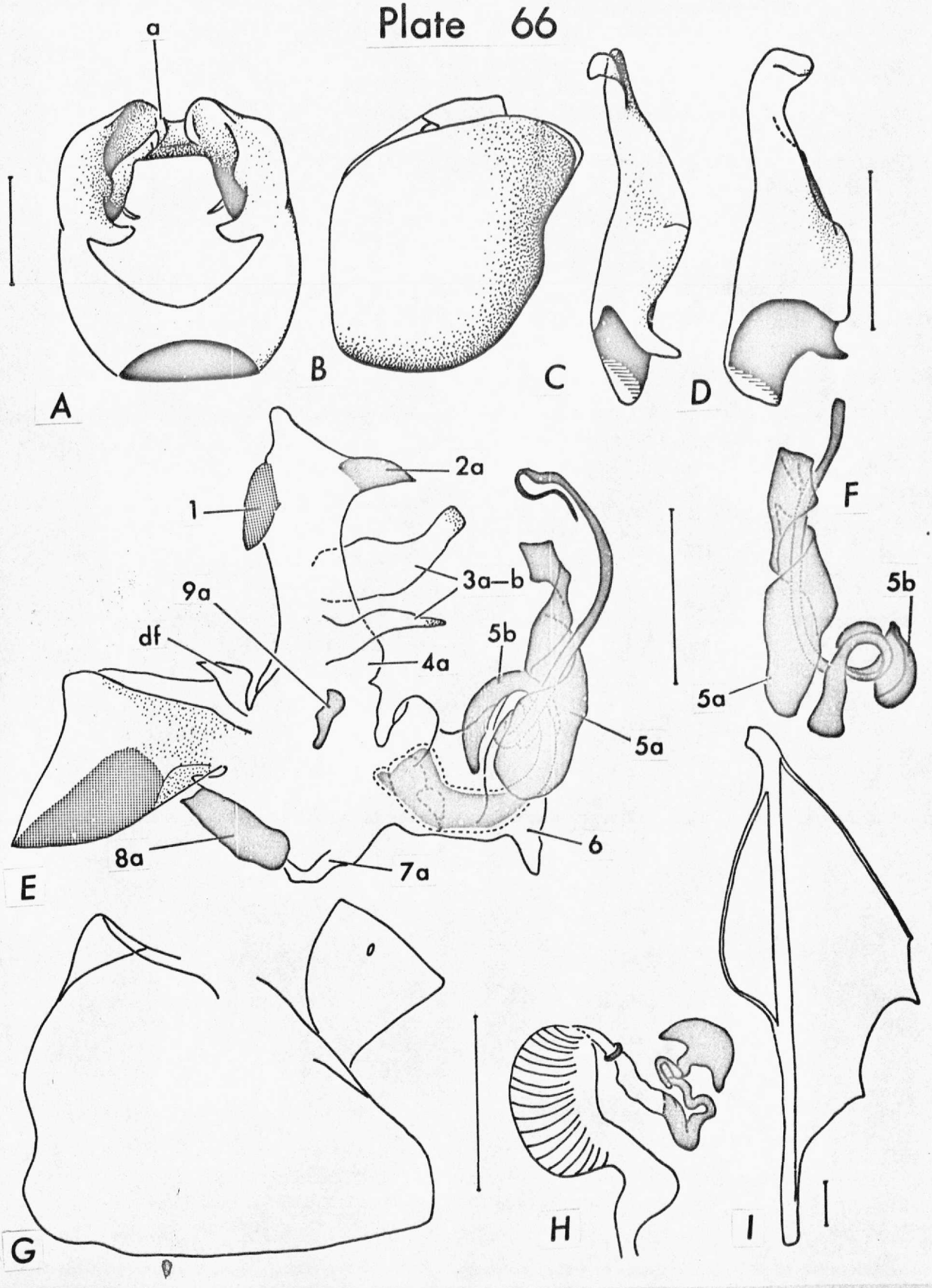


Table 67 Measurements (1 ♂ and 2 ♀♀ from 2 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	22.0	22.0	2	24.5-25.0	24.7
2 Head length	1	3.55	3.55	2	3.89-4.04	3.96
3 " width	1	2.56	2.56	2	2.75-2.85	2.80
Distance:						
4 inter-ocular	1	1.48	1.48	2	1.52-1.61	1.56
5 ante-ocular	1	1.93	1.93	2	2.10-2.14	2.12
Antennae:						
6 segm. I length	1	3.34	3.34	2	3.32	3.32
7 " II "	1	5.28	5.28	2	5.28-5.56	5.42
8 " III "	1	3.55	3.55	2	4.03-4.08	4.05
9 " IV "	1	6.48	6.48	2	6.52-7.10	6.81
Labium:						
10 segm. I length	1	3.95	3.95	2	3.99-4.31	4.15
11 " II "	1	4.14	4.14	2	3.99-4.18	4.08
12 " III "	1	2.12	2.12	2	2.24-2.47	2.35
13 " IV "	1	4.82	4.82	2	5.13-5.76	5.44
14 Pronotum length	1	4.41	4.41	2	5.08	5.08
15 " width	1	9.21	9.21	2	10.3-11.1	10.7
16 Scutellum length	1	2.69	2.69	2	3.13-3.23	3.18
17 " width	1	2.64	2.64	2	3.09-3.15	3.12
18 Hind tibia length	1	11.6	11.6	2	12.0-12.3	12.1
Tibial dilation:						
19 total width	1	3.98	3.98	2	4.41-4.56	4.48
external part:						
20 length	1	8.64	8.64	2	9.12-9.60	9.36
21 width	1	2.49	2.49	2	2.68-2.92	2.80
internall part:						
22 length	1	5.52	5.52	2	5.95-6.00	5.97
23 width	1	1.00	1.00	2	1.29-1.39	1.34
24 Undilated portion	1	2.16	2.16	2	1.92-2.11	2.01
Ratios: (figures refer to character numbers above).						
1 / 2	1	6.19:1	6.19:1	2	6.18-6.29:1	6.23:1
1 / 18	1	1.89:1	1.89:1	2	1.99-2.08:1	2.04:1
2 / 3	1	1.38:1	1.38:1	2	1.41	1.41:1
6 / 2	1	0.94:1	0.94:1	2	0.82-0.85:1	0.83:1
10 / 2	1	1.11:1	1.11:1	2	0.98-1.10:1	1.04:1
9 / 6	1	1.94:1	1.94:1	2	1.96-2.13:1	2.08:1
15 / 16	1	3.42:1	3.42:1	2	3.18-3.54:1	3.36:1
20 / 18 %	1	74.4	74.4	2	76.0-78.0	77.3
22 / 18 %	1	47.5	47.5	2	48.3-50.0	49.3

Veneza corcula (Say) 1832 comb.n

(Plate 67)

Anisoscelis corculus Say, 1832: 12. Holotype U.S.A. (lost)

Theognis exellens Mayr, 1865: 434. [Synonymized by Stål, 1870: 165.19]

Leptoglossus corculus (Say): Stal, 1870:165.19; Lethierry & Severin, 1894: 47; Van Duzee, 1917: 88; Gibson, 1917: 70, 71; Parshley, 1923: 748; Blatchley, 1926: 222; Deay, 1928: 377; Torre-Bueno, 1941: 49; Froeschner, 1942: 594.599; Allen, 1969: 130.

Theognis corculus (Say): Hussey, 1953: 30.

General and differential diagnosis: In addition to the characters mentioned by Allen (1969), the shape and size of the spermatheca is also characteristic. For the differentiating characters from its most closely related species V. occidentalis see discussion in Allen (1969:130).

Description: General characters see Blatchley, 1926: 222 and Allen, 1969: 130.

Male genitalia: No male specimens were available for study.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with ovoidal duct dilation, tubular part of the duct very long and gradually curved, widening proximally.

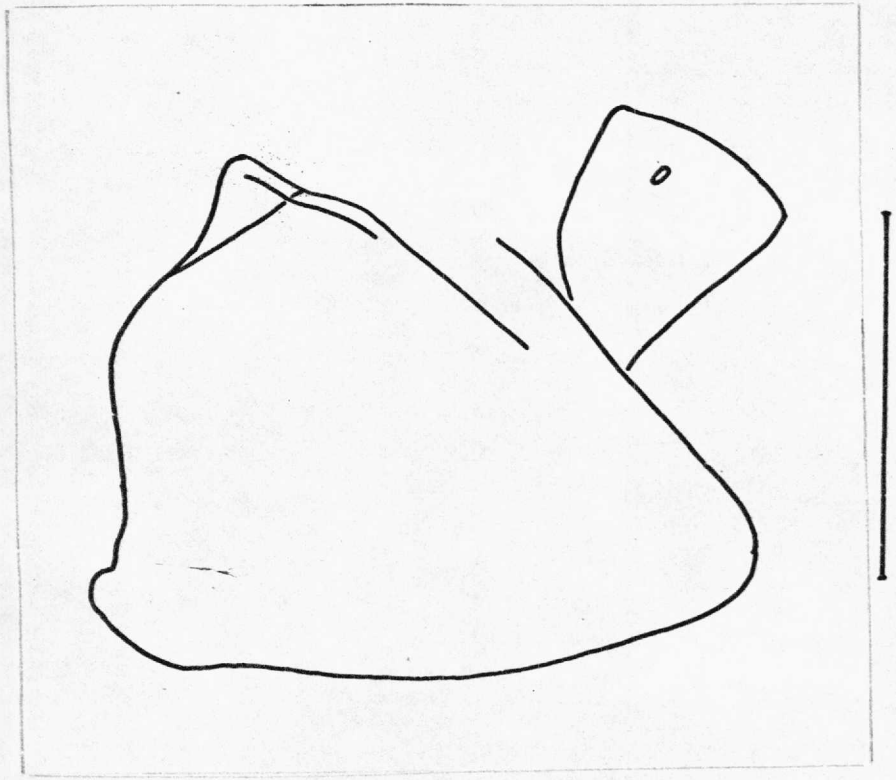
Measurements and ratios: (see table 68)

Geographical distribution: (Map 25) Only known from U.S.A. The distribution range mentioned by Allen 1969 extends from "New York south to Florida, west to Missouri and southwest to Texas". The material available for study was collected within that range.

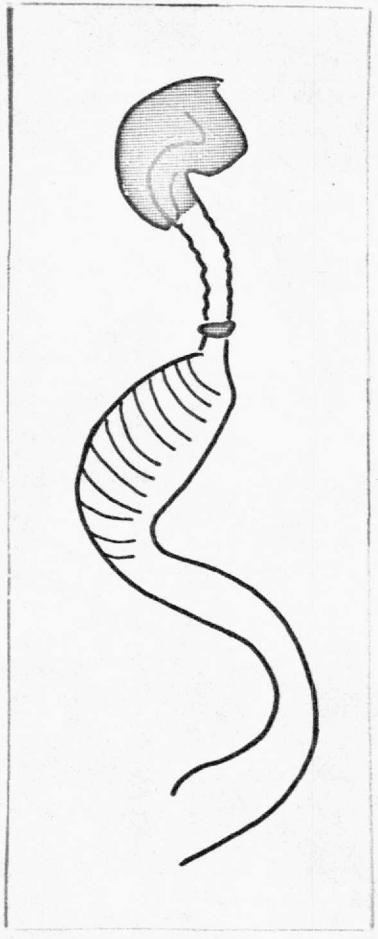
Material examined

U.S.A.: Nelson Co. Virginia, 8 - VIII - 1925, W. Robinson, 1 ♀ (BMNH); Dallas, Texas, 1 ♀ (AM); Dunn-Loring, Virginia, 30 - VIII - 1916, W.L. McAtee, on Pinus virginiana, 1 ♀ (RNH); Virginia, Vienna, H.G. Barber, 1 ♀ (ZI); Colorado, Baker, 1 ♂ (TM).

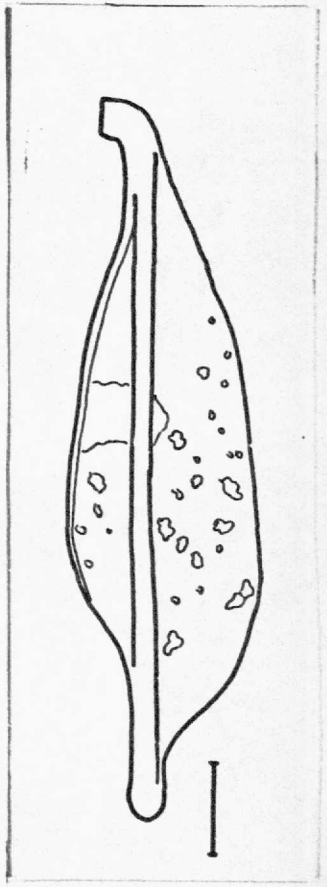
Plate 67



G



H



I

Table 68 Measurements (3 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	-	—	—	3	16.5-19.0	17.8
2 Head length	-	—	—	3	3.04-3.23	3.13
3 " width	-	—	—	3	2.33-2.41	2.37
Distance:						
4 inter-ocular	-	—	—	3	1.38-1.48	1.42
5 ante-ocular	-	—	—	3	1.53-1.67	1.61
Antennae:						
6 segm. I length	-	—	—	3	2.09-2.28	2.15
7 " II "	-	—	—	3	3.64-3.98	3.85
8 " III "	-	—	—	3	2.73-2.97	2.84
9 " IV "	-	—	—	2	2.49-2.54	2.51
Labium:						
10 segm. I length	-	—	—	3	2.88-3.13	3.04
11 " II "	-	—	—	3	2.88-3.13	3.04
12 " III "	-	—	—	3	1.53-1.71	1.60
13 " IV "	-	—	—	3	2.86-3.45	3.19
14 Pronotum length	-	—	—	3	3.02-3.64	3.38
15 " width	-	—	—	3	5.37-5.85	5.62
16 Scutellum length	-	—	—	3	2.12-2.58	2.35
17 " width	-	—	—	3	2.24-2.56	2.41
18 Hind tibia length	-	—	—	3	7.05-7.20	7.15
Tibial dilation:						
19 total width	-	—	—	3	1.82-1.87	1.83
external part:						
20 length	-	—	—	3	5.18-5.56	5.40
21 width	-	—	—	3	0.76-0.91	0.81
internal part:						
22 length	-	—	—	3	3.84-4.32	4.00
23 width	-	—	—	3	0.52-0.62	0.56
24 Undilated portion	-	—	—	3	0.76-1.00	0.84
Ratios: (figures refer to character numbers above).						
1 / 2	-	—	—	3	5.42-5.88:1	5.68:1
1 / 18	-	—	—	3	2.29-2.69:1	2.48:1
2 / 3	-	—	—	3	1.27-1.34:1	1.32:1
6 / 2	-	—	—	3	0.64-0.75:1	0.68:1
10 / 2	-	—	—	3	0.89-1.02:1	0.97:1
9 / 6	-	—	—	2	1.11-1.19:1	1.15:1
15 / 16	-	—	—	3	2.26-2.53:1	2.39:1
20 / 18 %	-	—	—	3	73.4-77.2	75.5
22 / 18 %	-	—	—	3	53.3-60.0	55.9

Veneza occidentalis (Heidemann) 1910 comb.n.

(Plate 68)

Leptoglossus occidentalis Heidemann, 1910: 196, pl. 8, fig. 2.

Lectotype ♂ U.S.A. (USNM) [Synonymized by Allen 1969: 131, examined]

Leptoglossus occidentalis Heidemann: Van Duzee, 1917: 89; Gibson, 1917: 70; Torre-Bueno, 1941: 49; Allen, 1969: 131.

Theognis occidentalis (Heidemann): Hussey, 1953: 29

General and differential diagnosis: In addition to the characters mentioned by Allen (1969), the shape and size of spermatheca is also characteristic. For differences between this species and V. corcula see discussion in Allen (1969: 131).

Description: General characters see Allen, 1969: 131.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with deep and wide trapezoidal notch; dorsal prongs absent; inflected portion of posterior margin with a pair of lateral prominences at base of median notch (a), separated from each other by a rectangular depression; posterior margin slightly below the lateral margin; the latter gradually rising posteriorly, not flared. Paramere (fig. C,D) - shaft wide and depressed dorsally; outer lobe absent; shank without median lobe; hook strongly curved, tapering distally, with small medial apical projection.

Phallus (fig. E) - conjunctiva with long uniformly wide dorsal sac and armed with the following processes: 1 slightly sclerotized and very small; 2a-b moderately sclerotized, 2a acute, 2b blunt and smaller; 3a-b membranous, 3b moderately long and swollen, 3a short and wide rapidly tapering distally; 4a-b weakly sclerotized, short and wide, not very prominent dorso-ventrally; 9a-b heavily sclerotized, very conspicuous with curved and pointed antero-lateral projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) slightly tapering distally. IInd convolution almost as long as the Ist.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with small ovoidal to globular duct dilation, tubular portion of the duct long, curved and widening proximally.

Measurements and Ratios: (see table 69)

Geographical distribution: (Map 25) Only known from Canada and U.S.A. The distribution range given by Allen 1969 extends from "British Columbia and Alberta southward to Arizona, New Mexico and Texas, eastward to Iowa". The material examined in this study was collected within this range.

Habitat and Biology: See Koerber (1963) for biology and economic importance.

Material examined

a) Type material: Lectotype ♂ of Leptoglossus occidentalis Heidemann from U.S.A., Utah, Amarilla in USNM (Type No. 13230).

b) Other material: CANADA: British Columbia, Penticton, 23 - I - 1925, W. Dones, 1 ♀ (BMNH). U.S.A.: Colorado, Boulder, - XII - 1904, Cockerell, 1 ♀ (BMNH); Grange, Wn., J. Stehlik, 1 ♂ (BMNH); College place, Wn., 10 - XII - 1941, P. Travis, 1 ♂ (BMNH).

Plate 68

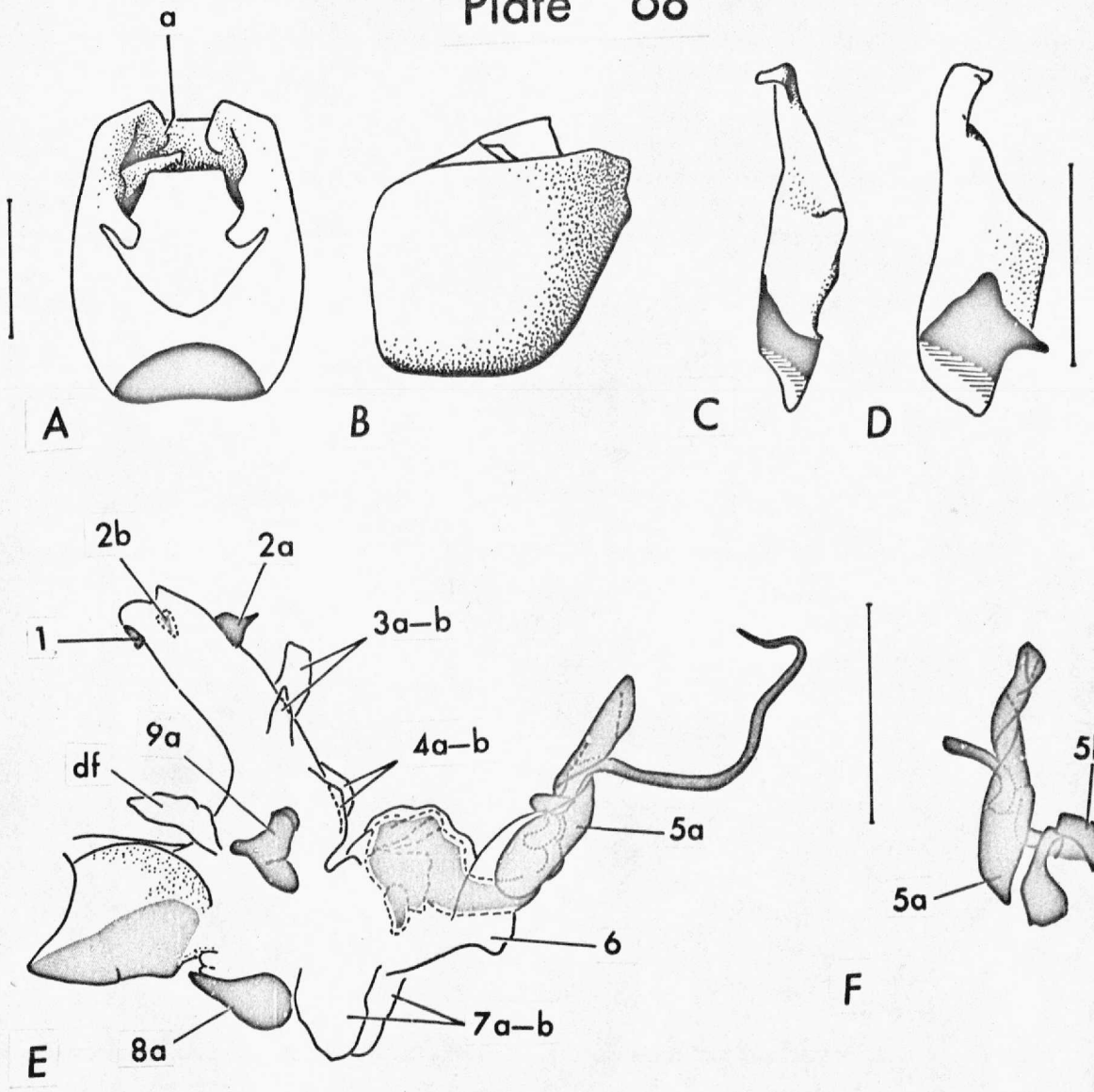


Table 69 Measurements (3 ♂♂ and 2 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	16.5–18.8	17.4	2	15.6–19.0	17.3
2 Head length	3	2.88–3.17	2.97	2	3.04–3.13	3.08
3 " width	3	2.24–2.33	2.28	2	2.26–2.35	2.30
Distance:						
4 inter-ocular	3	1.29–1.33	1.30	2	1.29–1.38	1.33
5 ante-ocular	3	1.48–1.65	1.55	2	1.55–1.61	1.58
Antennae:						
6 segm. I length	3	2.47–2.73	2.63	2	2.37–2.51	2.44
7 " II "	2	3.60–3.84	3.72	2	3.45–3.55	3.50
8 " III "	2	2.68	2.68	2	2.54–2.64	2.59
9 " IV "	2	2.78–2.97	2.87	–	—	—
Labium:						
10 segm. I length	3	2.88–3.04	2.94	2	2.96–3.02	2.99
11 " II "	3	2.85–2.90	2.86	2	2.85–2.88	2.86
12 " III "	3	1.61–1.71	1.66	2	1.61–1.71	1.66
13 " IV "	3	3.32–3.85	3.54	2	3.32–3.51	3.41
14 Pronotum length	3	2.92–3.16	3.01	2	2.92–3.12	3.02
15 " width	3	4.84–5.47	5.08	2	5.13–5.37	5.25
16 Scutellum length	3	1.95–2.28	2.10	2	2.07–2.18	2.12
17 " width	3	2.01–2.26	2.12	2	2.09–2.39	2.24
18 Hind tibia length	3	6.67–7.58	7.08	2	7.20	7.20
Tibial dilation:						
19 total width	3	1.20–1.44	1.28	2	1.34–1.44	1.39
external part:						
20 length	3	3.50–4.22	3.93	2	3.93	3.93
21 width	3	0.43–0.62	0.51	2	0.48–0.68	0.58
internal part:						
22 length	3	3.02–3.36	3.15	2	3.16–3.64	3.40
23 width	3	0.38–0.52	0.46	2	0.48	0.48
24 Undilated portion	3	1.92–2.20	2.06	2	2.20–2.40	2.30
Ratios: (figures refer to character numbers above).						
1 / 2	3	5.72–5.93:1	5.85:1	2	5.13–6.07:1	5.61:1
1 / 18	3	2.42–2.48:1	2.45:1	2	2.16–2.63:1	2.40:1
2 / 3	3	1.26–1.36:1	1.30:1	2	1.33–1.34:1	1.33:1
6 / 2	3	0.85–0.93:1	0.88:1	2	0.77–0.80:1	0.79:1
10 / 2	3	0.90–1.05:1	0.98:1	2	0.96–0.97:1	0.97:1
9 / 6	2	1.03–1.08:1	1.09:1	–	—	—
15 / 16	3	2.31–2.53:1	2.41:1	2	2.46–2.47:1	2.47:1
20 / 18 %	3	50.0–61.1	55.5	2	54.5	54.5
22 / 18 %	3	40.5–50.3	44.4	2	43.8–50.5	47.2

Veneza clypealis (Heidemann) 1910 comb.n.

(Plate 69)

Leptoglossus clypealis Heidemann, 1910: 195, pl. 8, fig. 1. Holotype ♂, U.S.A., Colorado, Platte Canon, 5 - 20 - 01. Dyar & Caudell, Type No. 13229 (USNM).

Leptoglossus clypealis Heidemann: Van Duzee, 1917: 90; Gibson, 1917: 70; Deay, 1928: 378; Torre-Bueno, 1941: 49; Froeschner, 1942: 593. 599, pl. 4, fig, 42; Drew & Schaefer, 1963: 114, pl. 1, fig. 17; Allen, 1969: 132.

Theognis clypealys (Heidemann): Hussey, 1953: 30.

General and differential diagnosis: In addition to the characters mentioned by Allen (1969), the shape and size of spermatheca is also characteristic.

Description: General characters see Allen, 1969: 131.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with narrow rectangular to "U" shaped notch; dorsal prongs absent; inflected portion of posterior margin with a pair of small lateral elevations at base of median notch; posterior margin slightly below the lateral margin; the latter barely rising posteriorly, not flared. Paramere (fig. C,D) - outer lobe long, narrow and rounded, very conspicuous; shank thin with

large median lobe; hook strongly curved, tapering distally with very small medial spical projection. Phallus (fig. E) - similar to that of V. occidentalis except for: processes 1 and 2a-b more sclerotized and larger; process 3a and process 5a (fig. E,F) longer.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with ovoidal duct dilation, tubular portion of the duct very long, strongly curved in the middle, gradually bulging proximally.

Measurements and Ratios: (see table 70)

Geographical distribution: (Map 25) Only known from **southwest and** central parts of U.S.A. and Mexico.

Material examined

U.S.A.: 20 - V - 1937, G.C. Varly, 1 ♀ (BMNH); Arizona, Reddington Rd. 25 ml east Tucson, 8 - X - 1951, E.C. Zimmerman, 1 ♂, 1 ♀ (BMNH); Texas, Dallas, 1945, 1 ♂ (BMNH); Texas, Marfa, 12 - VII - J. Stehlik, 1 ♀ (BMNH); Iowa, Shenandoah, 23 - VIII - 1956, K.L. Rhodebeck, 2 ♂, 1 ♀ (MNHN); Texas, 1 ♀ (NR); New Mexico, Roswell, 13 - VII - 1935, Zhenzhurist, 1 ♂ (ZI); Arizona, Cochise, 7 - VII - 1935, s.c., 1 ♂ (ZI); Colorado, Golden, 22 - VII - 1909, W.J. Gerhard, on Cedar, 1 ♂, 1 ♀ (TM); Texas, 1875, Boll, 1 ♀ (NM); Texas, San Marcos, 7 - IX - 1952, Elkins, 1 ♂, 1 ♀ (ZSBS); Oklahoma, Mormann, 8 - VI - 1950, Reinthal, 3 ♂ (ZSBS); Texas, Tuks Lake St. P.K., Burnet Co., 7 - IX - 1968, R.C. Allen, 3 ♂, 7 ♀ (MNHU).

Plate 69

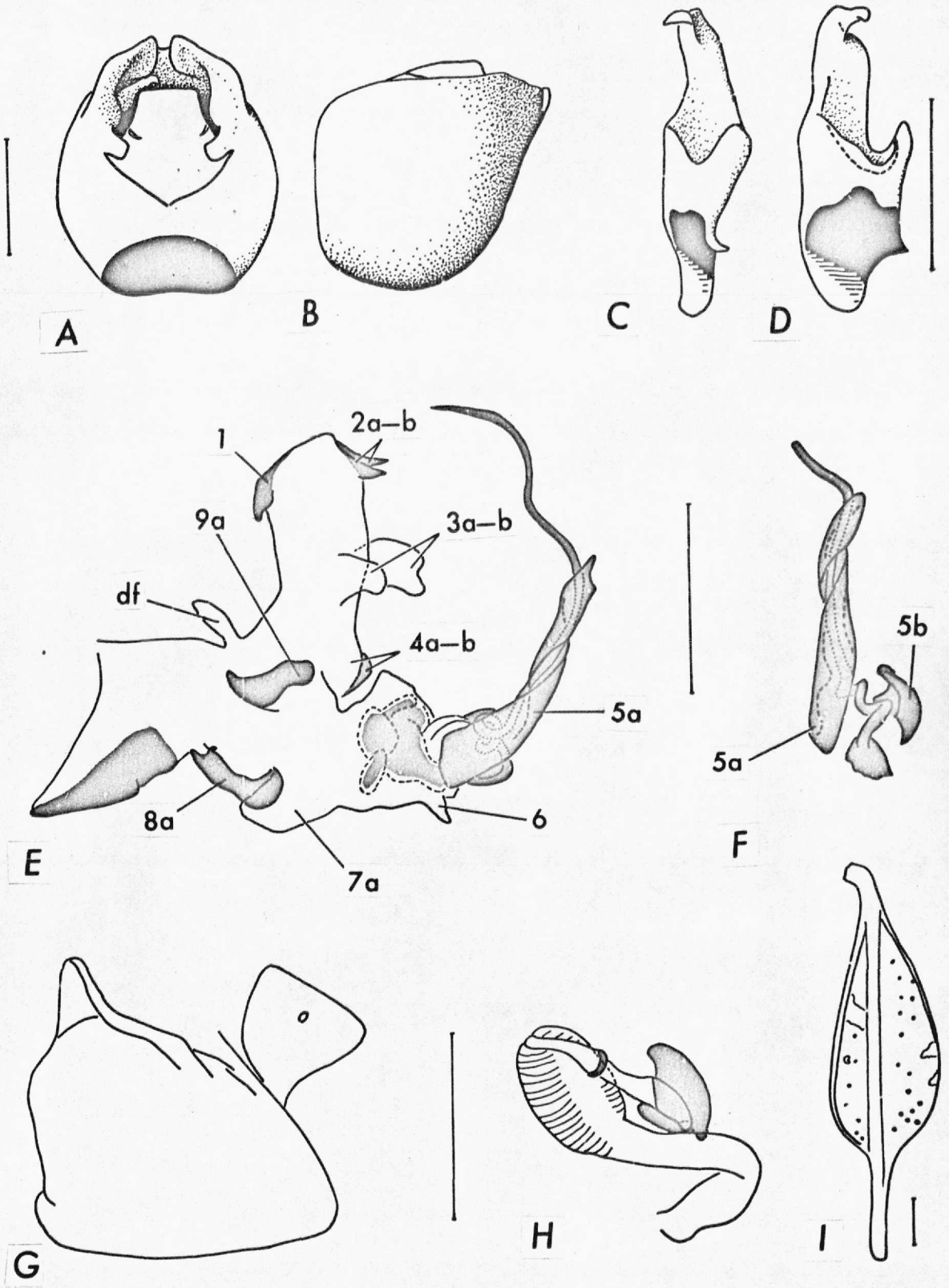


Table 70 Measurements (3 ♂♂ and 3 ♀♀ from 5 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	3	17.5–19.2	18.2	3	18.2–19.2	18.8
2 Head length	3	2.69–2.86	2.78	3	2.77–3.07	2.96
3 " width	3	2.14–2.37	2.24	3	2.31–2.45	2.39
Distance:						
4 inter-ocular	3	1.31–1.33	1.31	3	1.34–1.42	1.38
5 ante-ocular	3	1.33–1.52	1.41	3	1.52–1.55	1.53
Antennae:						
6 segm. I length	2	2.18–2.85	2.51	3	2.41–2.66	2.57
7 " II "	2	3.12–3.84	3.48	3	3.31–3.98	3.71
8 " III "	2	2.20–2.68	2.44	3	2.68–2.97	2.82
9 " IV "	2	3.21–3.74	3.47	3	2.30–4.12	3.11
Labium:						
10 segm. I length	3	2.01–2.10	2.06	3	2.28	2.28
11 " II "	3	1.71–1.99	1.87	3	2.05–2.28	2.14
12 " III "	3	1.04–1.14	1.08	3	1.10–1.23	1.18
13 " IV "	3	1.78–1.86	1.81	3	1.86–2.10	1.98
14 Pronotum length	3	2.97–3.36	3.23	3	3.40–3.93	3.72
15 " width	3	4.89–5.52	5.31	3	5.95–6.05	6.00
16 Scutellum length	3	2.09–2.29	2.15	3	2.10–2.43	2.27
17 " width	3	2.01–2.24	2.13	3	2.33–2.47	2.40
18 Hind tibia length	2	8.54–8.78	8.66	3	7.20–9.21	8.46
Tibial dilation:						
19 total width	2	2.20–2.40	2.30	3	1.82–2.73	2.28
external part:						
20 length	2	5.52–6.14	5.83	3	4.80–6.29	5.74
21 width	2	1.05–1.29	1.17	3	0.91–1.44	1.11
internal part:						
22 length	2	4.80–5.28	5.04	3	4.08–5.28	4.83
23 width	2	0.72–0.76	0.74	3	0.56–0.96	0.81
24 Undilated portion	2	2.11–2.16	2.13	3	1.72–2.20	1.97
Ratios: (figures refer to character numbers above).						
1 / 2	3	6.45–6.71:1	6.54:1	3	5.92–6.93:1	6.35:1
1 / 18	2	2.07–2.18:1	2.10:1	3	2.06–2.52:1	2.22:1
2 / 3	3	1.20–1.25:1	1.24:1	3	1.31–1.14:1	1.23:1
6 / 2	2	0.81–1.02:1	0.91:1	3	0.78–0.96:1	0.86:1
10 / 2	3	0.72–0.77:1	0.74:1	3	0.74–0.82:1	0.77:1
9 / 6	2	1.31–1.47:1	1.38:1	3	0.95–1.54:1	1.21:1
15 / 16	3	2.33–2.64:1	2.46:1	3	2.48–2.85:1	2.64:1
20 / 18 %	2	64.6–69.9	67.3	3	66.6–68.4	67.8
22 / 18 %	2	56.2–60.1	58.1	3	56.6–57.3	57.0

Veneza brevirostris (Barber) 1918 comb.n

(Plate 70)

Leptoglossus brevirostris Barber, 1918: 35. Holotype ♂ U.S.A. (USNM) [examined]

Leptoglossus brevirostris Barber: Allen, 1969: 133.

Theognis brevirostris (Barber): Hussey, 1943: 30.

General and differential diagnosis: In addition to the characters mentioned by Allen (1969), the shape and size of the spermatheca is also characteristic. (For discussion on the relationships with the other species of the genus see Allen (1969: 133).

Description: General characters see Allen, 1969: 133.

Male Genitalia: No male specimens were available for dissection.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca with moderate kidney shaped duct dilation, tubular portion of the duct very long, gradually curved and moderately wide.

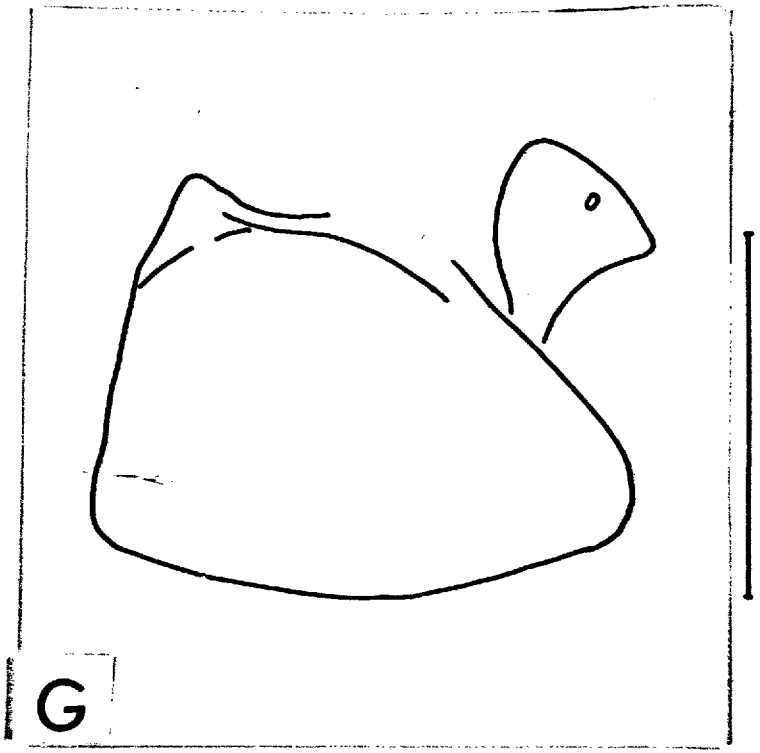
Measurements and Ratios: (see table 71)

Geographical distribution: (Map 24) Only known from the southwest part of U.S.A.

Material examined

Type material: Holotype ♂ of Leptoglossus brevirostris Barber, from U.S.A., Arizona, Huachuca Mts., 6 - VIII - 1905 in USNM (Type No. 61107). Paratypes: 5 ♀, same data as the holotype.

Plate 70



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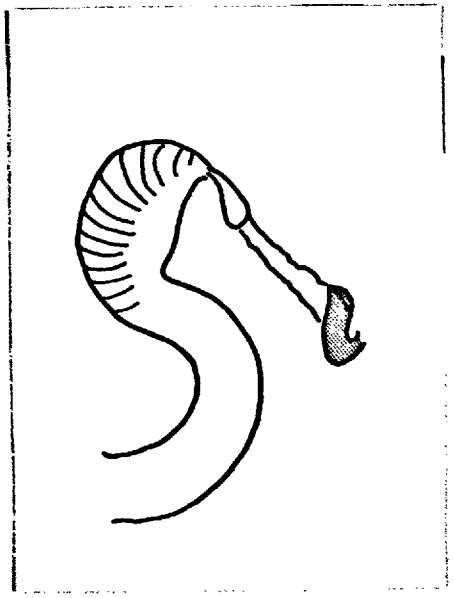

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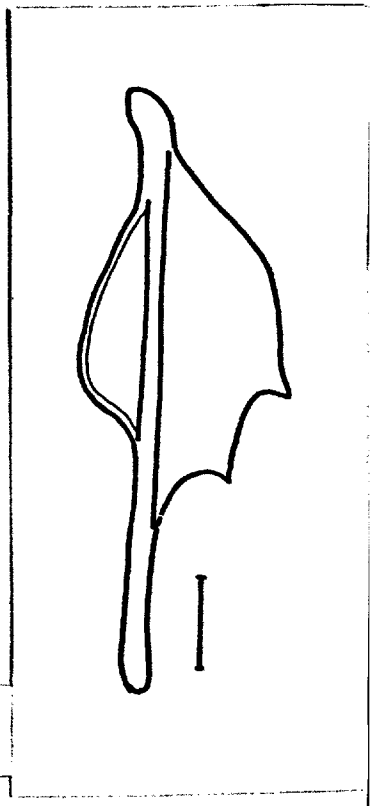

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Table 71 Measurements (5 ♀♀ from 1 locality) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	–	—	—	4	13.0–14.0	13.4
2 Head length	–	—	—	5	1.99–2.31	2.15
3 " width	–	—	—	5	1.90–2.05	1.95
Distance:						
4 inter-ocular	–	—	—	5	1.08–1.14	1.09
5 ante-ocular	–	—	—	5	1.06–1.17	1.10
Antennae:						
6 segm. I length	–	—	—	4	2.09–2.28	2.18
7 " II "	–	—	—	3	2.40–3.12	2.73
8 " III "	–	—	—	3	1.72–2.01	1.88
9 " IV "	–	—	—	3	2.88–3.26	3.03
Labium:						
10 segm. I length	–	—	—	5	1.48–1.78	1.58
11 " II "	–	—	—	5	1.42–1.71	1.52
12 " III "	–	—	—	5	0.60–0.76	0.66
13 " IV "	–	—	—	4	1.00–1.08	1.03
14 Pronotum length	–	—	—	5	2.54–3.02	2.73
15 " width	–	—	—	5	4.60–5.19	4.81
16 Scutellum length	–	—	—	5	1.57–1.76	1.66
17 " width	–	—	—	5	1.65–1.90	1.81
18 Hind tibia length	–	—	—	5	6.05–7.44	6.84
Tibial dilation:						
19 total width	–	—	—	5	2.30–2.54	2.41
external part:						
20 length	–	—	—	5	3.64–4.32	3.98
21 width	–	—	—	5	1.39–1.48	1.49
internal part:						
22 length	–	—	—	5	2.20–3.07	2.78
23 width	–	—	—	5	0.62–0.68	0.65
24 Undilated portion	–	—	—	5	1.77–2.40	2.13
Ratios: (figures refer to character numbers above).						
1 / 2	–	—	—	4	5.97–6.69:1	6.35:1
1 / 18	–	—	—	4	1.89–2.18:1	2.00:1
2 / 3	–	—	—	5	1.04–1.18:1	1.10:1
6 / 2	–	—	—	4	0.92–1.09:1	1.01:1
10 / 2	–	—	—	5	0.65–0.77:1	0.73:1
9 / 6	–	—	—	3	1.37–1.42:1	1.40:1
15 / 16	–	—	—	5	2.65–3.02:1	2.89:1
20 / 18 %	–	—	—	5	57.1–60.1	58.1
22 / 18 %	–	—	—	5	36.3–42.8	40.6

Veneza ashmeadi (Heidemann) 1909 comb.n.

(Plate 71)

Leptoglossus ashmeadi Heidemann, 1909: 237. Holotype ♀ U.S.A. (USNM) [examined]

Leptoglossus ashmeadi Heidemann: Van Duzee, 1917: 90; Gibson, 1917: 70; Blatchley, 1926: 225, fig. 43; Torre-Bueno, 1941: 50; Allen, 1969: 134.

Theognis ashmeadi Heidemann: Hussey, 1953: 31.

General and differential diagnosis: In addition to the characters mentioned by Allen (1969), the shape and size of the spermatheca is also characteristic.

Description: General characters see Allen, 1969: 134.

Male genitalia: Genital capsule (fig. A,B) - posterior margin with very wide rounded median notch; dorsal prongs (a) small and acute; inflected portion of posterior margin without prominences at base of the median notch; the margin lateral to dorsal prongs slightly projecting dorso-medially; posterior margin slightly below the lateral margins; the latter slightly ascending posteriorly and slightly flared. Paramere (fig. C,D) - outer lobe rounded; shank thin with long not very prominent median lobe; hook strongly curved, tapering distally, with very small

medial apical projection. Phallus (fig. E) - conjunctiva with moderate slightly bulging distally dorsal sac, and armed with the following processes: 1 moderately sclerotized, rugose and stout; 2a moderately sclerotized and pointed, 2b small and membranous; 3a-b membranous, with the ventral portion of the base moderately sclerotized; 2b elongate and bulging, 2a very small and pointed; 4a-b membranous, wide, not very conspicuous; 9a-b heavily sclerotized, very conspicuous with stout anterior lateral projection; 8a-b heavily sclerotized; 6 and 7a-b membranous; 5a (fig. E,F) with second convolution slightly depressed dorsally and expanded ventrally.

Female genitalia: Ist gonocoxa and VIIIth laterotergite as shown in fig. G; spermatheca (fig. H) with large kidney shaped duct dilation, tubular portion of the duct long, curved and moderately wide.

Measurements and Ratios: (see table 72)

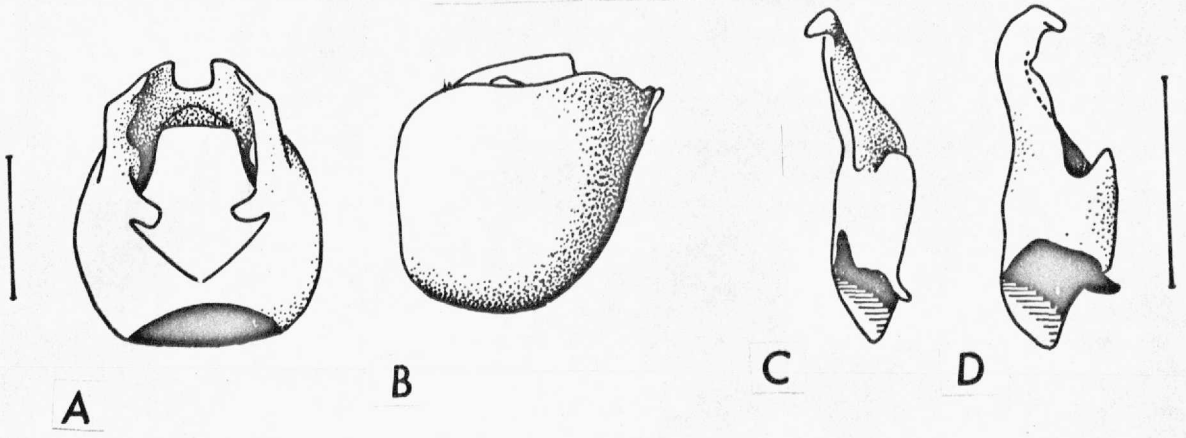
Geographical distribution: (Map 23) Only known from the southwest of U.S.A.

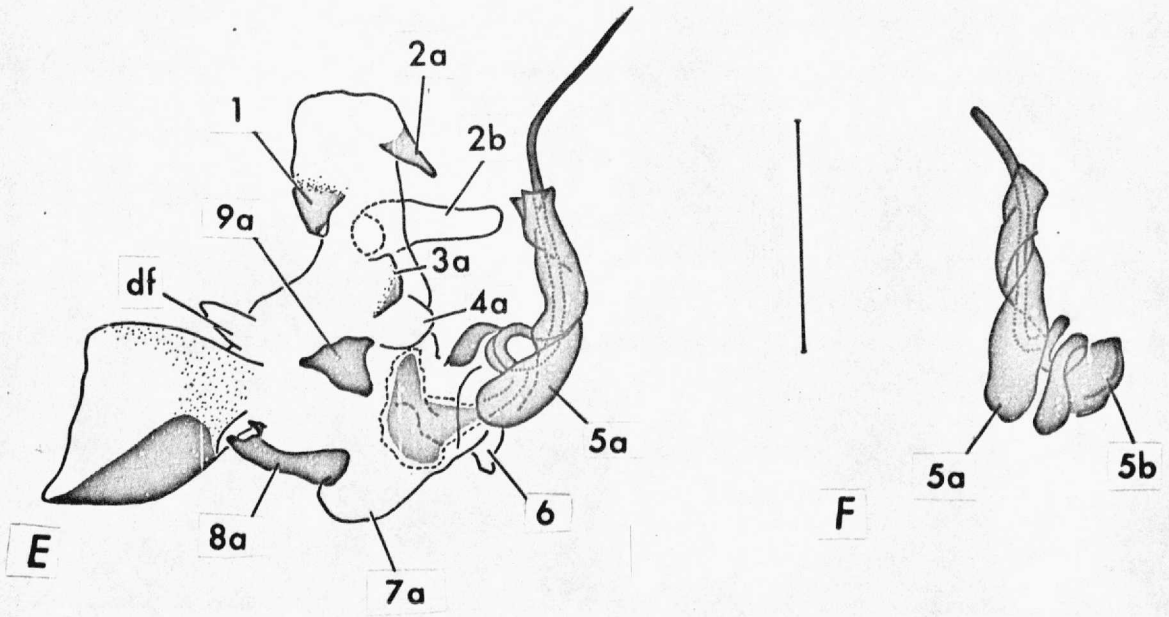
Material examined

a) Type material: Holotype ♀ of Leptoglossus ashmeadi Heidemann, from U.S.A. Florida, St. Nicholas in USNM (Type No. 12191).

b) Other material: U.S.A.: Florida, Dunedin, 4 - I - 1921, W.S.B., 1 ♀ (USNM); Mississippi, Ocean Springs, 22 - I - 1944, 1 ♂ (USNM); Mississippi, Natchez, 24 - 26 - V - 1909 on Phoradendron flavescens, E.S. Tucker, 2 ♀ (USNM).

Plate 71





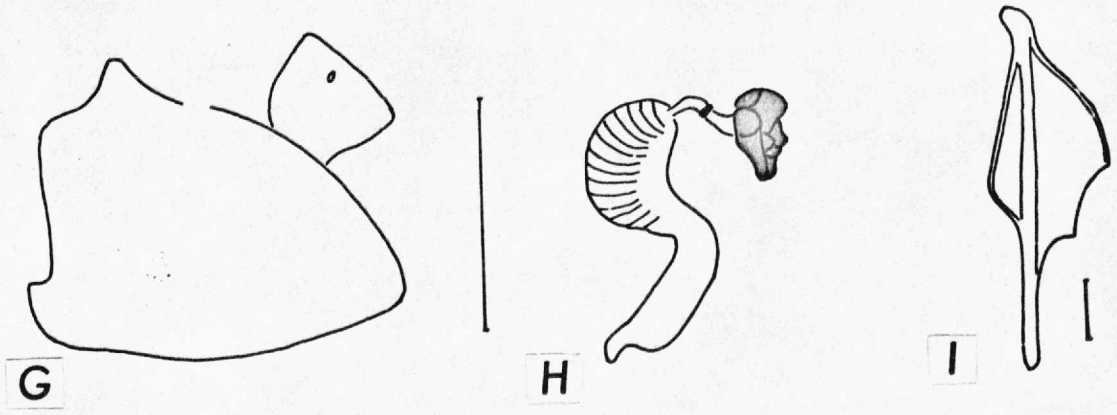


Table 72 Measurements (1 ♂ and 3 ♀♀ from 3 localities) in millimetres:

Characters:	Males			Females		
	No.	Range	Mean	No.	Range	Mean
1 Body length	1	15.7	15.7	3	13.6-15.6	14.6
2 Head length	1	2.18	2.18	3	2.28-2.47	2.35
3 " width	1	1.95	1.95	3	1.95-2.05	1.99
Distance:						
4 inter-ocular	1	1.10	1.10	3	1.10-1.19	1.13
5 ante-ocular	1	1.17	1.17	3	1.10-1.19	1.14
Antennae:						
6 segm. I length	1	2.75	2.75	3	2.28-2.51	2.42
7 " II "	1	2.92	2.92	3	2.68-3.21	2.85
8 " III "	1	1.96	1.96	3	1.72-1.92	1.85
9 " IV "	1	3.40	3.40	3	3.26-3.40	3.32
Labium:						
10 segm. I length	1	1.71	1.71	3	1.80-1.82	1.80
11 " II "	1	1.65	1.65	3	1.69-1.90	1.79
12 " III "	1	0.76	0.76	3	0.70-0.76	0.74
13 " IV "	1	1.10	1.10	3	1.17-1.33	1.26
14 Pronotum length	1	2.92	2.92	3	2.64-3.60	3.04
15 " width	1	5.32	5.32	3	4.84-5.52	5.19
16 Scutellum length	1	1.71	1.71	3	1.71-1.91	1.84
17 " width	1	1.99	1.99	3	1.80-2.16	2.01
18 Hind tibia length	1	6.57	6.57	3	6.19-6.96	6.59
Tibial dilation:						
19 total width	1	1.92	1.92	3	1.63-2.30	2.01
external part:						
20 length	1	3.45	3.45	3	3.84-4.12	3.93
21 width	1	1.00	1.00	3	0.96-1.44	1.24
internal part:						
22 length	1	2.40	2.40	3	2.40-2.97	2.75
23 width	1	0.48	0.48	3	0.43-0.48	0.46
24 Undilated portion	1	2.30	2.30	3	2.01-2.30	2.15
Ratios: (figures refer to character numbers above).						
1 / 2	1	7.20:1	7.20:1	3	5.96-6.32:1	6.21:1
1 / 18	1	2.38:1	2.38:1	3	2.19-2.24:1	2.21:1
2 / 3	1	1.11:1	1.11:1	3	1.14-1.20:1	1.18:1
6 / 2	1	1.26:1	1.26:1	3	1.00-1.08:1	1.02:1
10 / 2	1	0.78:1	0.78:1	3	0.73-0.78:1	0.76:1
9 / 6	1	1.23:1	1.23:1	3	1.31-1.42:1	1.37:1
15 / 16	1	3.11:1	3.11:1	3	2.75-2.89:1	2.82:1
20 / 18 %	1	52.5	52.5	3	58.0-65.2	59.6
22 / 18 %	1	36.5	36.5	3	38.7-43.5	41.7

ZOOGEOGRAPHY AND PHYLOGENETIC RELATIONSHIPS

The present state of knowledge of the tribe Anisoscelini concerns mainly morphological characters used for classification of the group and for identification of species, and no pure morphological comparative studies have been carried out. The other aspects, such as ecology, physiology and genetics have not been studied at all, and the biologies of only a few species are known. The records of the time of occurrence and the distribution are usually incomplete and fragmentary, due to lack of the relevant data on labels of the material in collections.

The morphological characters together with the known geographical distribution allow however some comments and conclusions concerning the relation of Anisoscelini within Coreidae as well as affinities of various forms within the tribe itself. These conclusions have to be considered as tentative until more information becomes available.

The tribe Anisoscelini is mainly represented in the Neotropical Region where it is widely distributed, although two of the genera occur also in the Nearctic Region, with one species reaching as far north as British Columbia and Alberta in Canada. One species of the genus Fabrictilis gen.n. has an extremely wide distribution and occurs in all tropical and subtropical areas of the world, but this species is absent in America.

The largest number of species is found in the northern half of South America, the number of species gradually diminishing to the north and south. Ten out of thirteen genera are represented in this area but none is exclusive to it. This distribution suggests that the central and northern part of South America may represent the area of origin and speciacion of Anisoscelini. This assumption appears to be supported also by the fact that in the extreme north and south of the distribution of the tribe, none of the more primitive genera are represented.

Relationships with other tribes

Within the scope of the work on the Morphology and Higher Classification of Coreoidea, Schaefer (1965) also suggested a comprehensive intrafamily classification of Coreidae, which he divided into a number of groups and subgroups of tribes, and discussed their relationships. This study was based on rather limited material, usually only one or two species representing each tribe, sometimes with the two species belonging to the same genus. He based his classification mainly on the presence and development of processes (= appendages or lobes) of the conjunctiva. In Acanthocephala, the most advanced group, Schaefer included the tribes, Acanthocephalini, Leptoscelini and Anisoscelini,[1] and defined

[1] In Schaefer's work, the tribes Leptoscelini and Anisoscelini are referred to as Leptoscelidini and Anisoscelidini, which is incorrect because this does not conform with the recommended practice of formation of family group names of Greek origin, the stems of which in this case are Leptoscel... and Anisoscel... respectively.

the group as having: "1 or 2 pairs of dorsal conjunctival appendages; median dorsal lobe sclerite tipped; paired lateral appendages absent."

According to my observations on Anisoscelini none of these characters apply to this tribe because: 1) there are usually more than two pairs of dorsal conjunctival processes; 2) the dorsal sac (= median dorsal lobe or sac) may be with or without any sclerotizations; and 3) the absence of paired lateral processes is not a constant condition and in fact they are usually present.

Therefore these characters cannot be considered as defining and differentiating Acanthocephala as a group in Schaefer's conception.

Comparison of Schaefer's drawings and descriptions with my observations, made the homologies of his "dorsal and lateral appendages" with the conjunctival structures observed by me in Anisoscelini uncertain and doubtful.

Therefore I dissected some material of the tribes Acanthocephalini (3 species), Leptoscelini (3 species), and Mictini (4 species); the two species of Anisoscelini examined by Schaefer (loc. cit.) are included in the material of Anisoscelini studied by me (Veneza occidentalis and V. phyllopa).

The detailed and comparative examination of this additional material has led me to the following conclusions: 1) the lateral

appendages of Mictini, correctly described by Schaefer (loc. cit.), undoubtedly represents the lateral or latero-dorsal processes (9a-b) found in Anisoscelini. 2) These processes are also present in Leptoscelini occupying the same position as in Anisoscelini. 3) The same processes (9a-b) occur in Acanthocephalini but their position is more dorso-lateral, and posterior to the dorsal sac. This apparent more dorsal position of these processes in Acanthocephalini is probably due to reduction of the dorsal sac and dorsal region of conjunctiva, and expansion of its ventral portion, particularly of the processes 7a-b. 4) One pair of dorsal appendages referred to by Schaefer as characteristic of Acanthocephalini and Leptoscelini, and the lower of the two pairs in Anisoscelini correspond to the lateral appendages described by him in Mictini and in fact all are homologous with the lateral processes 9a-b.

Schaefer (loc. cit) divided the Acanthocephala group into two subgroups: Subgroup A, characterized by "1 pair of sclerotized dorsal conjunctival appendages", in which he included Acanthocephalini and Leptoscelini, and subgroup B, characterized by "two pairs of dorsal conjunctival appendages" consisting of one tribe, the Anisoscelini.

Apart from confusing the lateral and dorsal processes, the definition and composition of these subgroups are also incorrect.

In Acanthocephalini the true dorsal processes are absent, and as already mentioned, the processes represent one pair of sclerotized somewhat dorsally situated lateral processes 9a-b.

In both Leptoscelini and Anisoscelini the lateral processes are usually present and the number of dorsal processes is not constant. In Leptoscelini the number varies from one pair which is sclerotized to 3 pairs with one of them sclerotized, and in Anisoscelini from one sclerotized pair (e.g. Fabrictilis gonagra) to four pairs of membranous or sclerotized processes with a single sclerotized additional one (genus Veneza).

Placing Acanthocephalini and Leptoscelini in one Subgroup Schaefer (loc. cit.) considered that these two tribes are more closely related than any of them to Anisoscelini. In fact the opposite is true and conditions of several other characters also indicate that Leptoscelini are very closely related to Anisoscelini and form well defined group sharing such characters as: all external characters mentioned in the diagnosis of Anisoscelini except for the absence of tibial dilation on hind tibia which is an obvious, but at present apparently the only character separating the two tribes. The following characters of male genitalia are also shared with Leptoscelini: presence of a well developed dorsal sac armed with variable number of membranous or sclerotized processes; processes 7a-b if present moderately developed, and processes 9a-b, if present in lateral position. In these two tribes, two forms of eggs occur i.e. cupuliform and subcylindrical, while in Acanthocephalini only

the cupuliform are present; the cupuliform shape of eggs is apparently the most generalized condition in Coreidae (Southwood, 1956) while the subcylindrical condition is the more specialised within the family, which suggests that Acanthocephalini have been separated as a distinct group before the condition of subcylindrical eggs were genetically established.

Acanthocephalini can be distinguished from both Anisoscelini and Leptoscelini by: head truncate not extending anterior to antenniferous tubercles; antenniferous tubercles large, occupying almost the whole anterior part of the head; juga very reduced; tylus laminated, compressed laterally, strongly projecting antero-dorsally as an acute horn; bucculae reaching behind the level of antenniferous tubercles; calli of pronotum not well differentiated; phallus with small to moderately developed dorsal sac; processes 7a-b strongly bulging ventrally occupying most of the ventral part of conjunctiva, and about twice the size of the dorsal sac; processes 8a-b very small reduced to a tiny protuberant sclerotized area; processes 9a-b in dorsal position close to the base of dorsal sac.

The conditions of morphological characters of Acanthocephalini including the shape of the eggs appear to be more primitive than those of both Leptoscelini and Anisoscelini and therefore represent a rather more primitive group not closely related to the two other tribes. Further studies are necessary to confirm this suggestion. The relationships between these three tribes is summarized in the tables 73 and 74.

Table 73 Characters separating tribes of Acanthocephala group.

	Characters.	Tribes		
		Anisos.	Leptos.	Acanthocoph.
1	Bright colouration	±	±	−
2	Tibial dilation	+	−	+
3	Head truncated	−	−	+
4	Antenniferous tubercles large	−	−	+
5	Juga reduced	−	−	+
6	Tylus laminated	−	−	+
7	Buccula extended posteriorly	−	−	+
	Genitalia:			
8	Dorsal sac well developed	+	+	−
9	Processes 7a-b very large	−	−	+
10	" 9a-b presente	±	±	+
11	if present in lateral position	+	+	−
12	Processes 8a-b well developed	+	+	−
13	Eggs subcylindrical	±	±	−

Table 74 The number of characters shared by and separating each pair of tribes.

Sharing / Differs	Anisoscelini	Leptoscelini	Acanthocephalini
Anisoscelini	—	12	1 + (3)
Leptoscelini	1	—	0 + (3)
Acanthocephalini	9	10	—

Figures in ( ) indicate the number of character present or absent in either of the two tribes concerned.

Relationships between genera

The tribe Anisoscelini is divided in three groups of genera: Anisoscelis group, Diactor group and Leptoglossus group. The Anisoscelis group differs from the other two, mainly by: comparatively small cupuliform eggs with rounded sides and corners; the prescence of processes 14a-b; subproctigeral sac usually present; process 9a-b, if present membranous; duct of spermatheca not dilated and usually long. The Diactor group is characterized by having: the eggs cupuliform , large with sharp corners; no dorsal fold nor processes 14a-b; characteristic shape of paramere (see plate 25.C.D.); processes 9a-b long swollen and bending forwards; dorsal sac of conjunctiva very elongate; tibial dilation very wide, undulated, without emarginations. The Leptoglossus group by: the eggs subcylindrical with one side flat; dorsal fold present; processes 9a-b flat projecting anteriorly, usually sclerotized; tibial dilation lanceolate or foliaceous, usually emarginate.

The geographical distribution of these three groups overlap but show differences in the pattern of distribution and in the magnitude of the occupied area. Anisoscelis group is distributed over Central America, Antilles and South America, and except for Antilles the range of one species (Holhymenia histrio, which has the widest distribution in this group), extends over the whole area, i.e. from Southern Mexico to northern Argentina. The distribution of Diactor group, at present based on only 1 genus

and 2 species and therefore only provisional, extends over Central and South America from Mexico to northern part of Argentina. Leptoglossus group has the widest distribution of all, extending from British Columbia and Alberta in Canada, over Central America and Antilles, down to about 40° South latitude in Argentina and Chile; one species occurs only in the Ethiopian, Oriental and Australian regions.

The Anisoscelis group retains more ancestral characters than any of the two other groups, e.g. : the shaft of paramere without distal cavity; shank of paramere flat without the hook; low number of sclerotized processes on conjunctiva; spermatheca without duct dilation, and the generalized shape of eggs. The more restricted distribution of Anisoscelis group, if compared with Leptoglossus group, probably indicates low potential for change or development of new adaptive features to cope with the environmental requirements of new areas, with the exception of representatives of 2 genera (Anisoscelis and Chondrocera) which have colonized the Antilles.

The Diactor group is at present considered more advanced than the Anisoscelis group, as suggested by the rather specialized and unique conditions of genital capsule, dorsal sac of conjunctiva, process 9a-b and tibial dilation, and the presence of duct dilation of spermatheca. But as already said Diactor shows the most ancestral condition concerning the shape of parameres, which apparently remained unchanged during the evolution of this group.

The Leptoglossus group is the most advanced in the tribe as indicated by: the shaft of paramere usually with distal cavity; shaft of paramere not flat and terminating in a hook; higher number of sclerotized processes of conjunctiva; spermatheca usually with duct dilation; and the specialized type of eggs. The evolutionary trend in the group is indicated by gradually increasing complexity of the posterior margin of genital capsule, the development of median lobe on the shank of parameres, the increase in the number of sclerotized processes of conjunctiva and the development of the duct dilation of spermatheca.

The foliaceous tibial dilation shows various degrees of differences which operate at generic and specific levels within all three groups and cannot be used for definition of the groups of genera. Also it is not correlated with specialized conditions of other characters, e.g. Chondrocera, Anisoscelis and Bitta in the more primitive Anisoscelis group have larger tibial dilation than any genus in the more advanced Leptoglossus group; its presence and larger size is considered to represent more specialized condition. On the other hand the form and size of eggs give a clear indication of the relationships of the groups of genera.

Tables 75 and 76 summarize the relationships between these three groups of genera.

Table 75 Characters separating groups of genera of Anisoscelini.

Characters	Groups of Genera		
	Anisoscelis	Diactor	Leptoglossus
1 Eggs subcylindrical	−	−	+
2 Bright colouration	+	+	−
3 Antenna with segment expanded	±	−	−
4 Pronotal extensions	±	−	−
5 Tibial dilation very wide	±	+	−
6 Genital capsule with deep notch and projections	−	−	±
7 Paramere somewhat twisted	+	−	+
8 Shaft of paramere with distal cavity	−	−	±
9 Shank of paramere with hook	−	−	+
10 " " with median lobe	−	−	±
11 Subproctigeral sac	−	+	+
12 Phallotheca with dorsal fold	−	−	+
13 " with processes 14a-b	−	+	+
14 Conjunctiva with high number of sclerotized processes	−	−	±
15 Processes 9a-b long bending forward	−	+	−
16 Processes 9a-b sclerotized	−	−	±
17 Spermatheca with duct dilation	−	+	+
Primitive condition	12	11	5
Advanced "	3	6	6
Both conditions present	3	−	6
Exclusives	2	2	5

Table 76 The number of characters shared by and separating each pair of group of genera.

Separating \ Sharing	Anisoscelis	Diactor	Leptoglossus
Anisoscelis	—	9 (3)	2 (9)
Diactor	5 (3)	—	4 (6)
Leptoglossus	6 (9)	7 (6)	—

Figures in ( ) indicate the number of characters present or absent in either of two tribes concerned.

Relationships of genera within each group

Anisoscelis group: is separated in two subgroups by the condition of the tibial dilation. The more primitive subgroup has tibial dilation on the external surface of the tibia only. This subgroup consist of 3 genera Holhymenia, Baldus and Tarpeius. The other subgroup is formed by the genera Chondrocera, Anisoscelis and Bitta and have the tibial dilation on both sides of the tibia. The genera Holhymenia, Baldus and Tarpeius also share: antenna with some segments expanded, pronotal expansions present and bulb of spermatheca elongate. In the other three genera, Chondrocera, Anisoscelis and Bitta, Chondrocera is differentiated by: tylus and juga above the level of antenniferous tubercles, humeral areas prominent and process 15a-b present. Anisoscelis and Bitta are closely related and share: antennal segments narrow and cylindrical; processes 15a-b of conjunctiva absent, and tylus and juga below the level of antenniferous tubercles.

Diactor group: Represented by a single isolated genus, shows unique conditions of several characters with no resemblance to those in other groups of the tribe.

Leptoglossus group: Is separated in two subgroups by the presence or absence of dilation on the spermathecal duct; the more primitive subgroup has no dilation and consists of the genera Theognis, Narnia and Stalifera. The second subgroup has the duct dilation and concists of 4 genera, Fabrictilis, Microphyllia,

Leptoglossus and Veneza. The genera Theognis and Narnia are closely related and characterized by: the absence of median and outer lobes of parameres, and the dorsal sac without processes on its distal and middle part; they possibly evolved locally and represent the most primitive group of forms in the Leptoglossus group. These two genera are only found in Central America, Mexico and southern part of U.S.A.

Stalifera shows more primitive character than any other genus of the group in the development of the spermatheca (without duct dilation) but has the number of processes of the dorsal sac higher than any other member of the Leptoglossus group, the condition considered here as the most advanced. This genus occurs principally in South America but one species with a very wide distribution extends from Mexico to northern part of Argentina. The genus Fabrictilis is the most primitive of the second subgroup, as indicated by: parameres simple without outer median lobe, dorsal sac without processes and small duct dilation. The genus Microphyllia, possesses an outer lobe on paramere, dorsal sac with membranous processes, and the duct dilation of spermatheca usually well developed; it occurs only in South America. Leptoglossus has: no outer lobe on paramere, but in some species the lateral margin of the shaft is expanded laterally; dorsal sac of conjunctiva with membranous processes and very large duct dilation of spermatheca. The range of distribution extends from North America to central Brasil, but only few records are available.

The genus Veneza is considered here to be the most advanced of the whole tribe as indicated by: paramere with outer and median lobe, dorsal sac with sclerotized processes, and spermatheca with large duct dilation. The development of the outer lobe of paramere varies from fully developed to more or less reduced and in one species it is altogether absent, the condition apparently due to secondary reduction of this lobe. The genus has the widest distribution range in the tribe and occurs in North America, Antilles and South America.

Evolution of the Anisoscelini

Assuming that the three tribes, Anisoscelini, Leptoscelini and Acanthocephalini, form a group Acanthocephala as suggested by Schaefer (loc. cit.) the tentative - speculative as it is - phylogenetic scheme drawn on Plate 72 is suggested. As illustrated, the shape and size of the eggs, as well as the condition of tibial dilation and presence or absence of duct dilation of spermatheca could be probably taken as landmarks in the evolution of this group.

Plate 72 Phylogenetic scheme of Anisoscelini.

SUMMARY

1.- This thesis is the result of three year's work in the Department of Zoology and Applied Entomology, Imperial College of Science and Technology, and in the Entomology Department British Museum (Natural History).

2.- The tribe Anisoscelini was found to be more related to Leptoscelini than to Acanthocephalini.

3.- A total of 72 species are included in the tribe Anisoscelini which is divided into three groups of genera: Anisoscelis group (6 genera), Diactor group (1 genus), and Leptoglossus group (7 genera).

4.- The tribe Anisoscelini is essentially Neotropical, but 6 species occur in the Nearctic region and only one does not occur in America at all, and is distributed over the Tropical zones of Ethiopian, Oriental and Australian regions.

5.- The material examined consisted of well over 5,000 specimens. Part of this material was made available through loans from the principal museums of the world; 554 dissections of male and female genitalia were made and detailed illustrations of genitalia are given for each species. The characters of ♀ genitalia were also used for the first time in Coreidae, and were found useful as supporting characters for general classification of the tribe.

6.- The osmotic method for inflation of the conjunctiva was found unsatisfactory in Anisoscelini, and a new technique,

described in detail, was used for complete evertion of conjunctiva.

7.- The genus Leptoglossus sens. lat. was divided into 4, and Anisoscelis into 2 genera, equivalent in rank to the genera previously recognized in Anisoscelini.

8.- The general external morphology of the tribe is given, but it does not differ greatly from most Coreoidae; some characters of the genitalia resemble very closely the conditions found in Leptoscelini.

9.- The possible evolutionary relationships of Anisoscelini with Leptoscelini and Acanthocephalini are discussed.

10.- Nomenclature:

New generic names: Bitta, Stalifera, Fabrictilis and Veneza.

New specific names: Holhymenia tucumana, H. vulsa, H. costalima, Chondrocera signoreti, Bitta hymana, Stalifera elongata, Theognis lanceatus Microphyllia alleni, M. pittieri, M. brasiliensis, Leptoglossus faveolatus, L. distanti, Veneza balloui.

New subspecific names: Bitta flavolineata rubica.

New synonymy - specific (invalid junior synonym placed first): Copium guttatum Thunberg = Holhymenia histrio (Fabricius), Copius intermedius Burmeinster = Holhymenia clavigera (Herbst), Holhymenia tibialis Breddin = Holhymenia clavigera (Herbst), Anisoscelis alipes Guerin = Bitta flavolineata flavolineata Blanchard, Narnia inornata Distant = Narnia femorata Stal, Leptoglossus grenadensis Allen = Veneza aucta (Fabricius), Anisoscelis minor Dallas = Veneza concolor (Walker).

New combinations:-

Transferred from Anisoscelis:

Bitta affinis (Westwood);

B. hymenifera (Westwood); B. flavolineata (Blanchard);

B. gradadia (Distant).

Transferred from Leptoglossus:

Stalifera cincta (herrich-Schaeffer);

S. crassicornis (Dallas); Theognis lineosus (Stal);

T. subauratus (Distant); Febrictilis gonagra (Fabricius);

F. australis (Fabricius); Microphyllia harpagon (Fabricius);

M. flavosignata (Blote); M. alata (Walker); Veneza chilensis (Spinola); V. impicta (Stal); V. quadricollis (Westwood); V. dentata (Berg); V. balteata (Linnaeus); V. phyllopa (Linnaeus); V. ingens (Mayr); V. macrophylla (Stal); V. conspersa (Stal); V. aucta (Fabricius); V. zonata (Dallas); V. opposita (Say); V. neovexillata (Allen); V. impictipennis (Stal); V. concolor (Walker); V. stigma (Herbst); V. lonchoides (Allen); V. pallidivenosa (Allen); V. humeralis (Allen); V. corcula (Say); V. occidentalis (Heidemann); V. clypealis (Heidemann); V. brevirostris (Barber); V. ashmead (Heidemann).

New status: Anisoscelis marginella Dallas = subspecies of Anisoscelis foliacea (Fabricius), Cimex membranaceos Fabricius = subspecies of Fabrictilis australis (Fabricius).

Supplementary Note

After this thesis was prepared, "type material of Burmeinster" was received from Martin Luther Universitat, Zoologischen Institute. Four specimens were sent as type material of Copius latreillei (st. Faug-Serville) of Burmeinster. After examination of the material it was found that the material consisted of: 1) two specimens one ♂ and one ♀ of Holhymenia histrio (Fabr.) both labelled "Are-as"; and 2) two o specimens of Holhymenia costalima sp.n. labelled "Rio d. Jan."; the heading label in the box reads "Latreille Serv., maculatus Thunberg, Bras. Burm.". The two specimens of H. histrio do not have anything to do with H. latreille; and perhaps are the types of Copius scurra Burmeinster (=H. histrio) but their labels do not agree with the material listed in Burmeinster (1835) publication. The two specimens of H. costalima agree with Burmeinster's data and consequently they are original material of Burmeinster. The name latreillei given by Burmeinster to this specimen does not invalidate the designation of the new species H. costalima in spite of being the same species, because as was mentioned in the discussion on H. costalima, Holhymenia latreillei St. Faug.-Serville is a junior synonym of H. clavigera Herbst. These two specimens represent nothing more than misidentified specimens of H. costalima; having actually examined the specimens I am designating them as paratypes. In synonymy of Holhymenia clavigera and H. costalima given in this work the following changes should be made.

The synonym of Copius latreillei (St. Farg.-Serville): 'Burmeinster 1835 : 330.4" should be transferred from H. clavigera to H. costalima as a misidentification.

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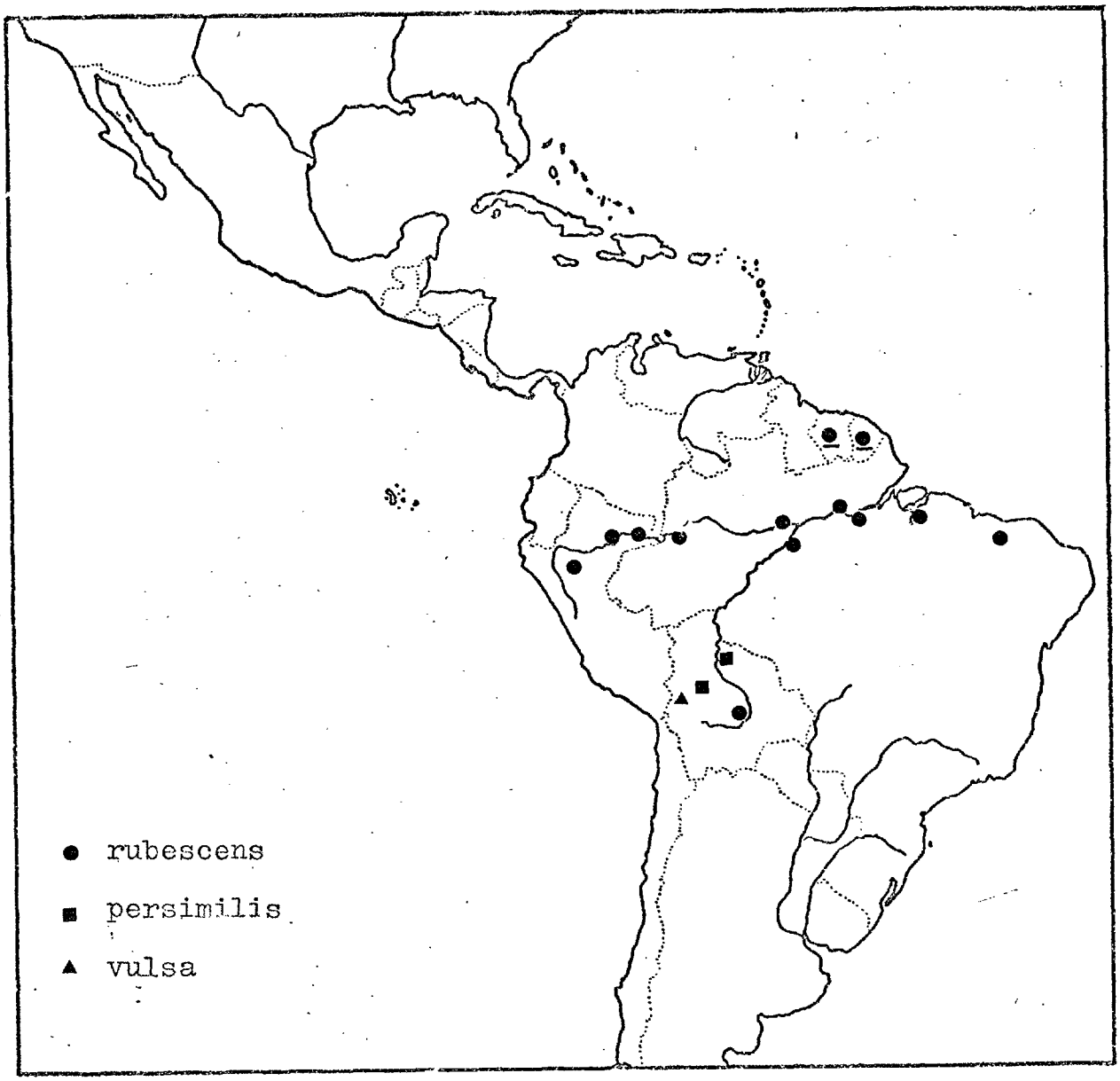
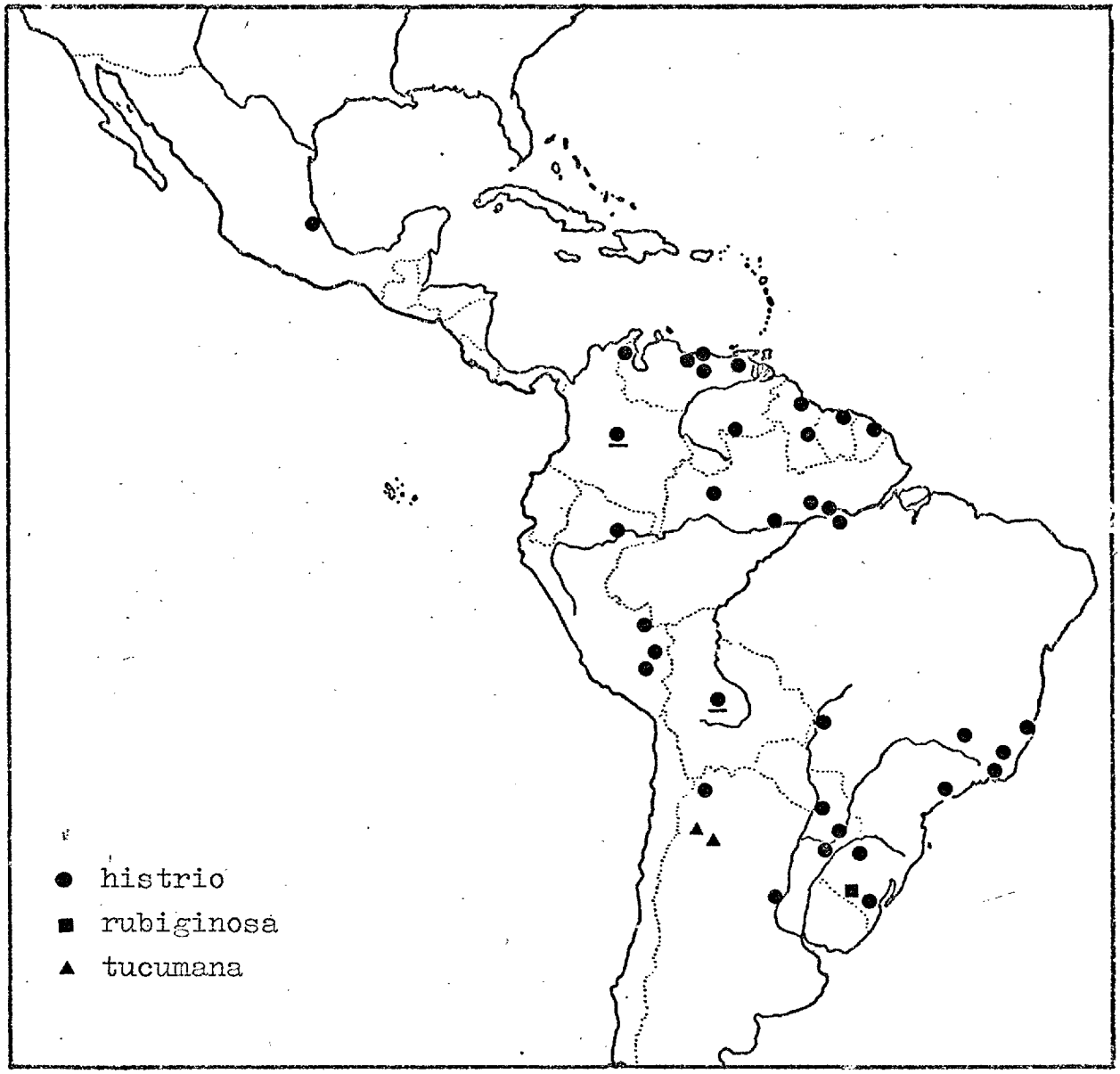
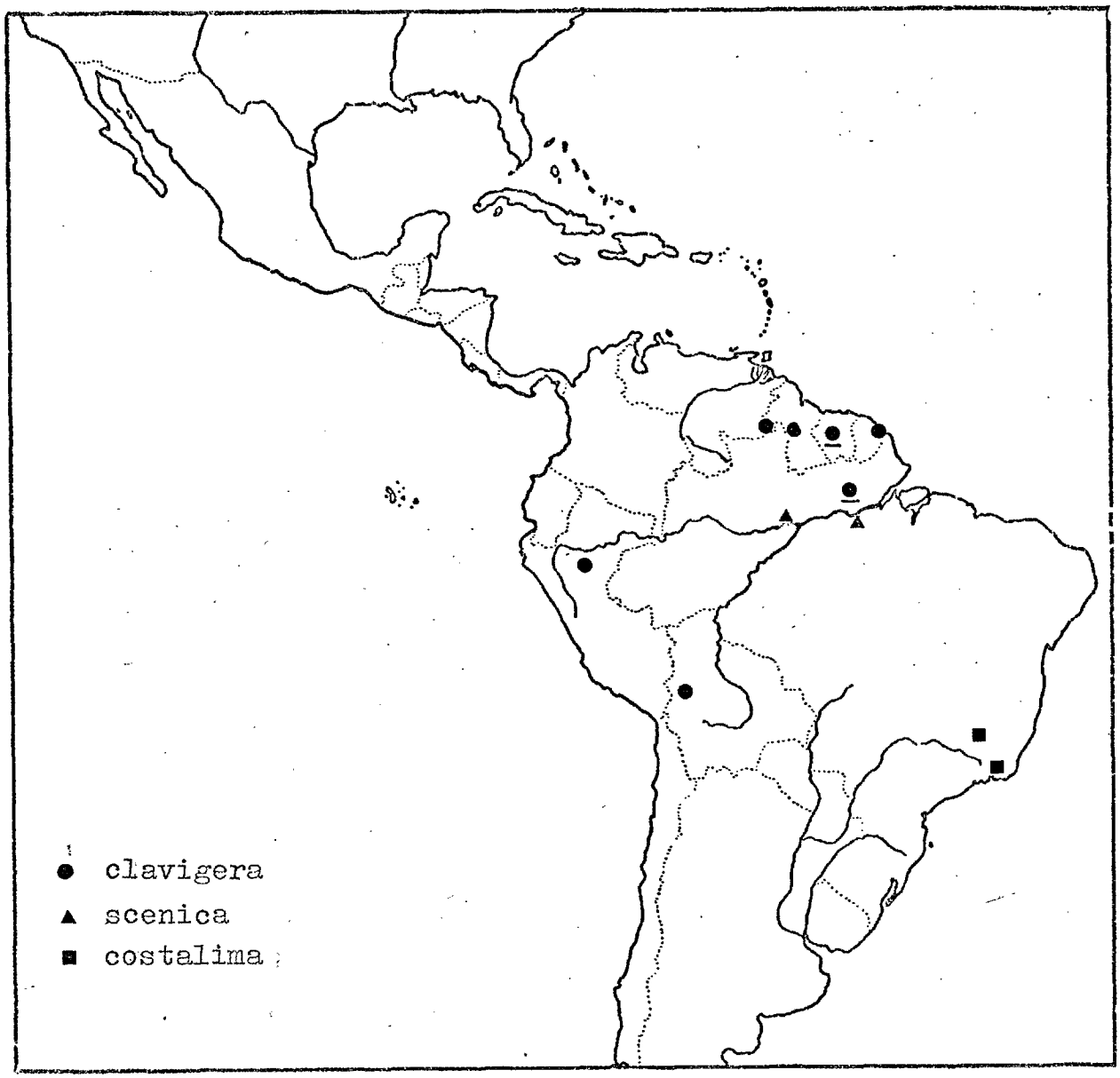


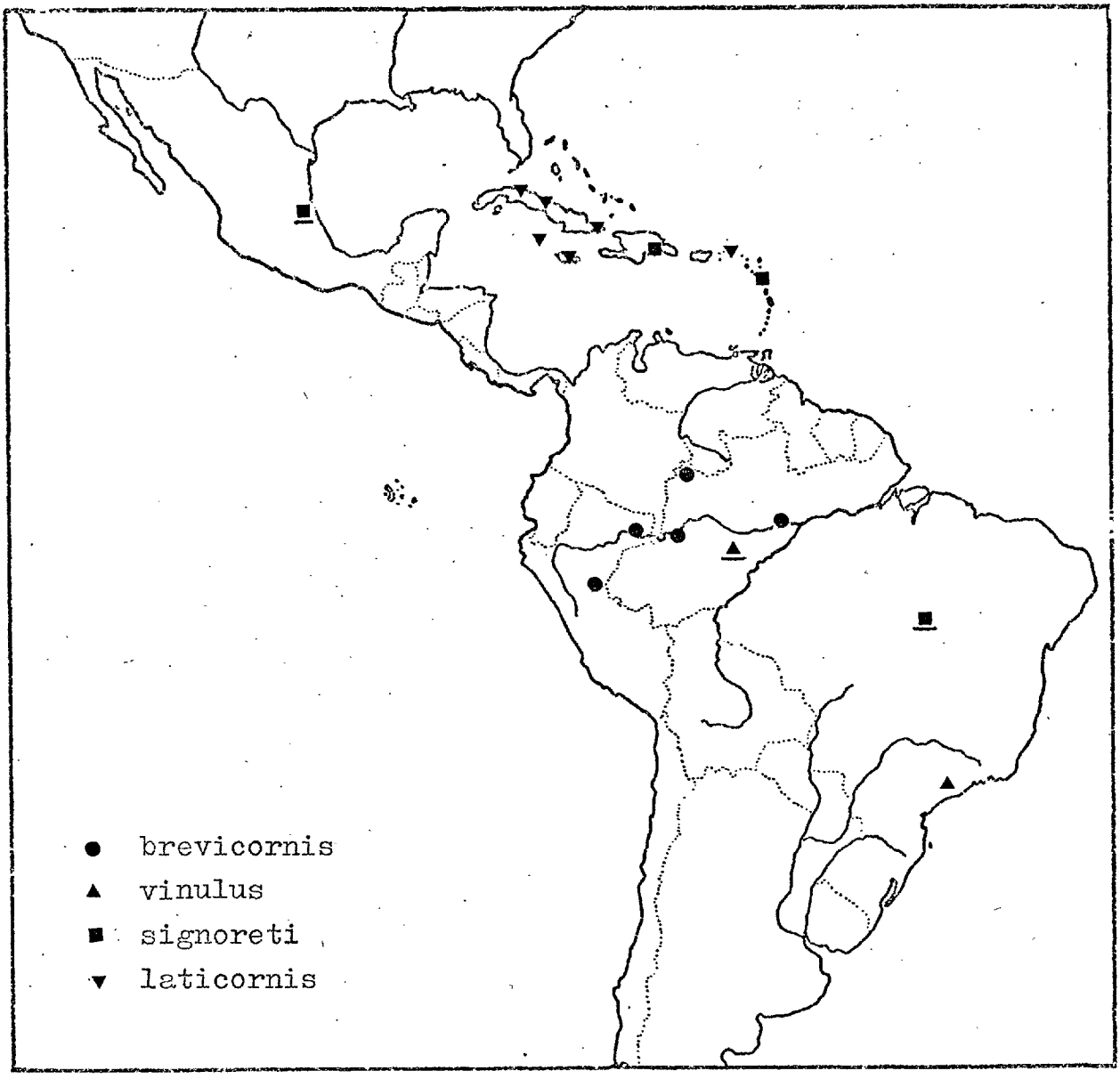
Map 1 Distribution of Holhymenia rubescens, persimilis and vulsa.



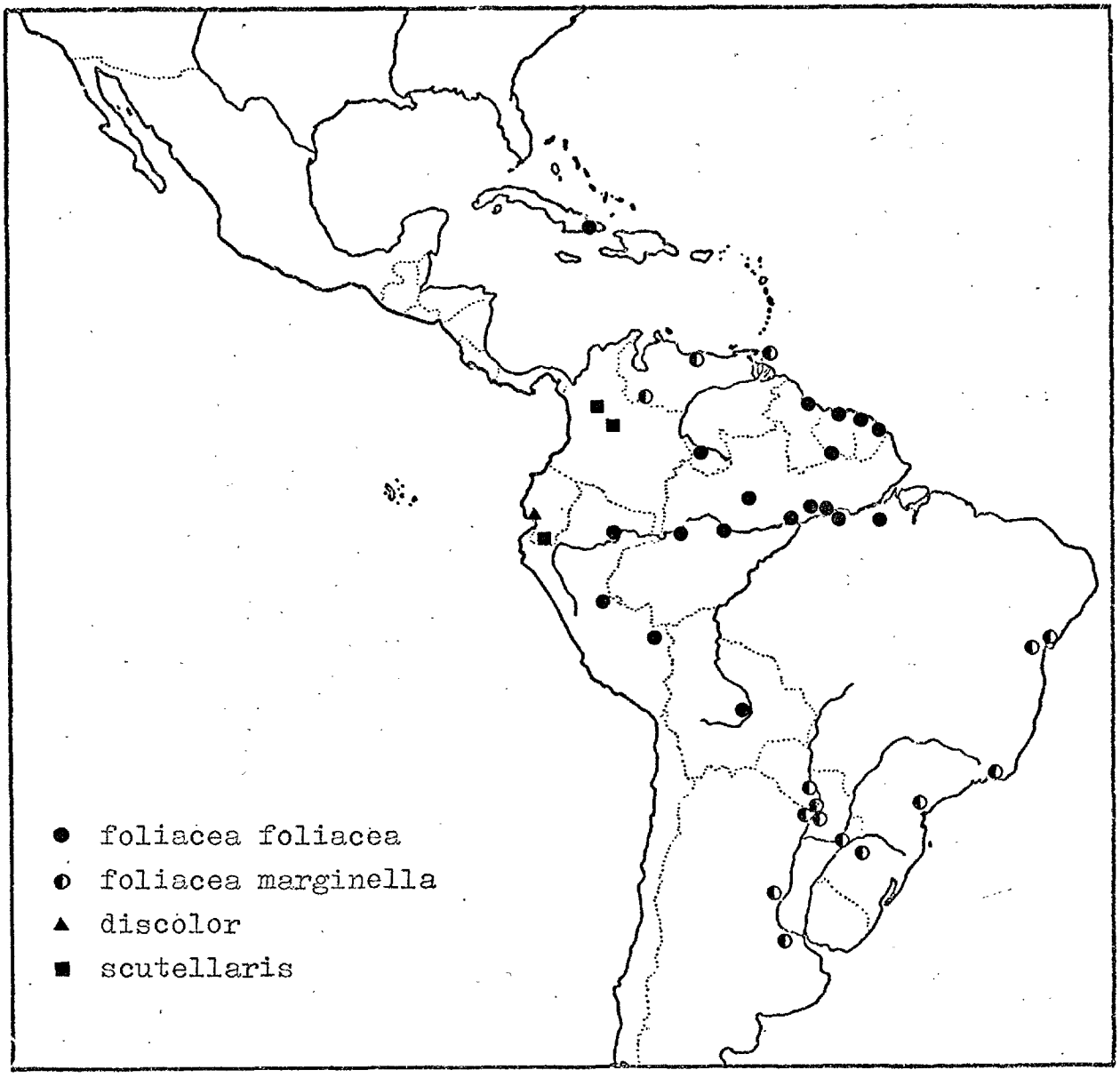
Map 2 Distribution of Holhymenia histrio, rubiginosa and tucumana.



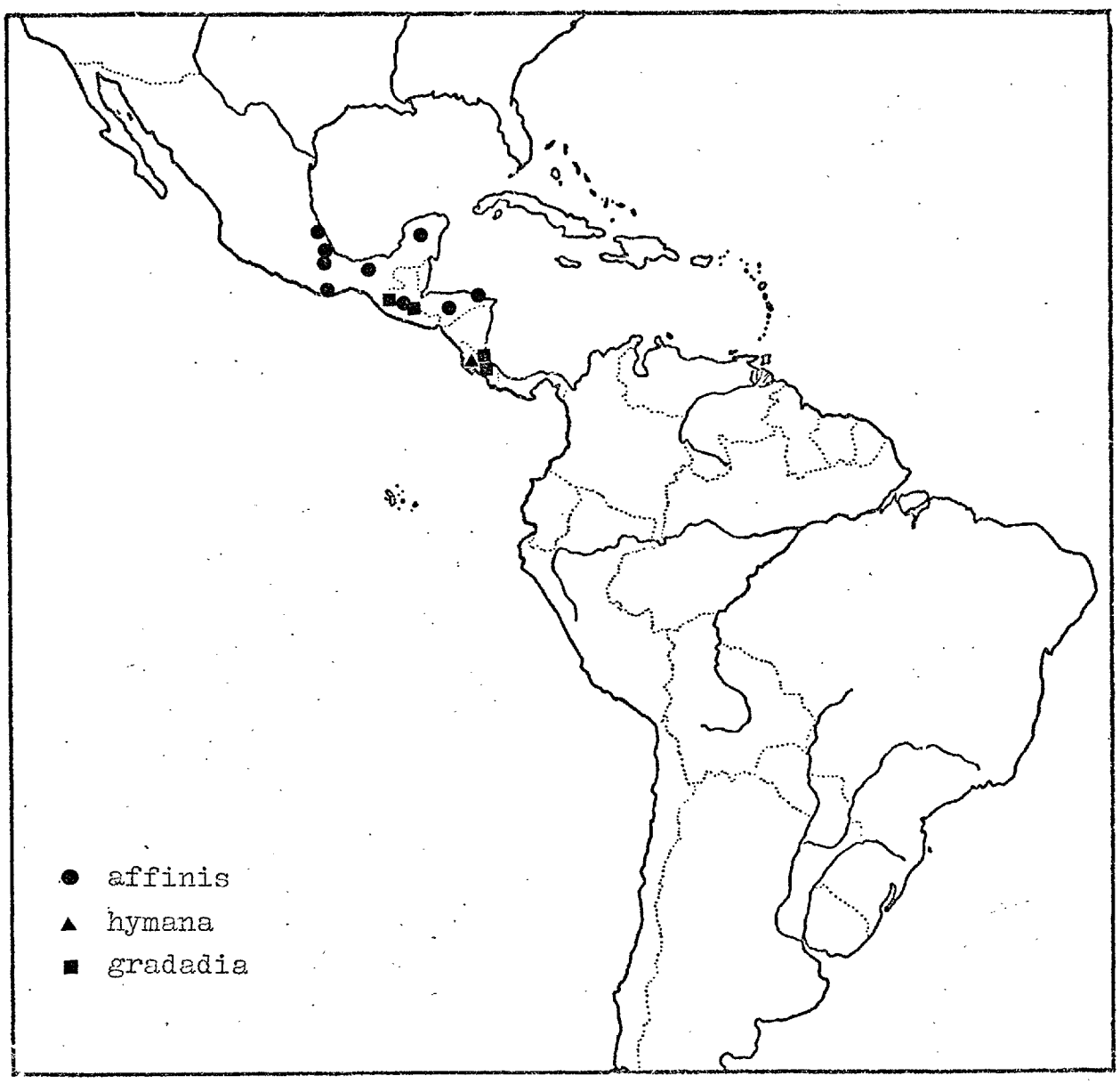
Map 3 Distribution of Holhymenia clavigera, costalima and scenica.



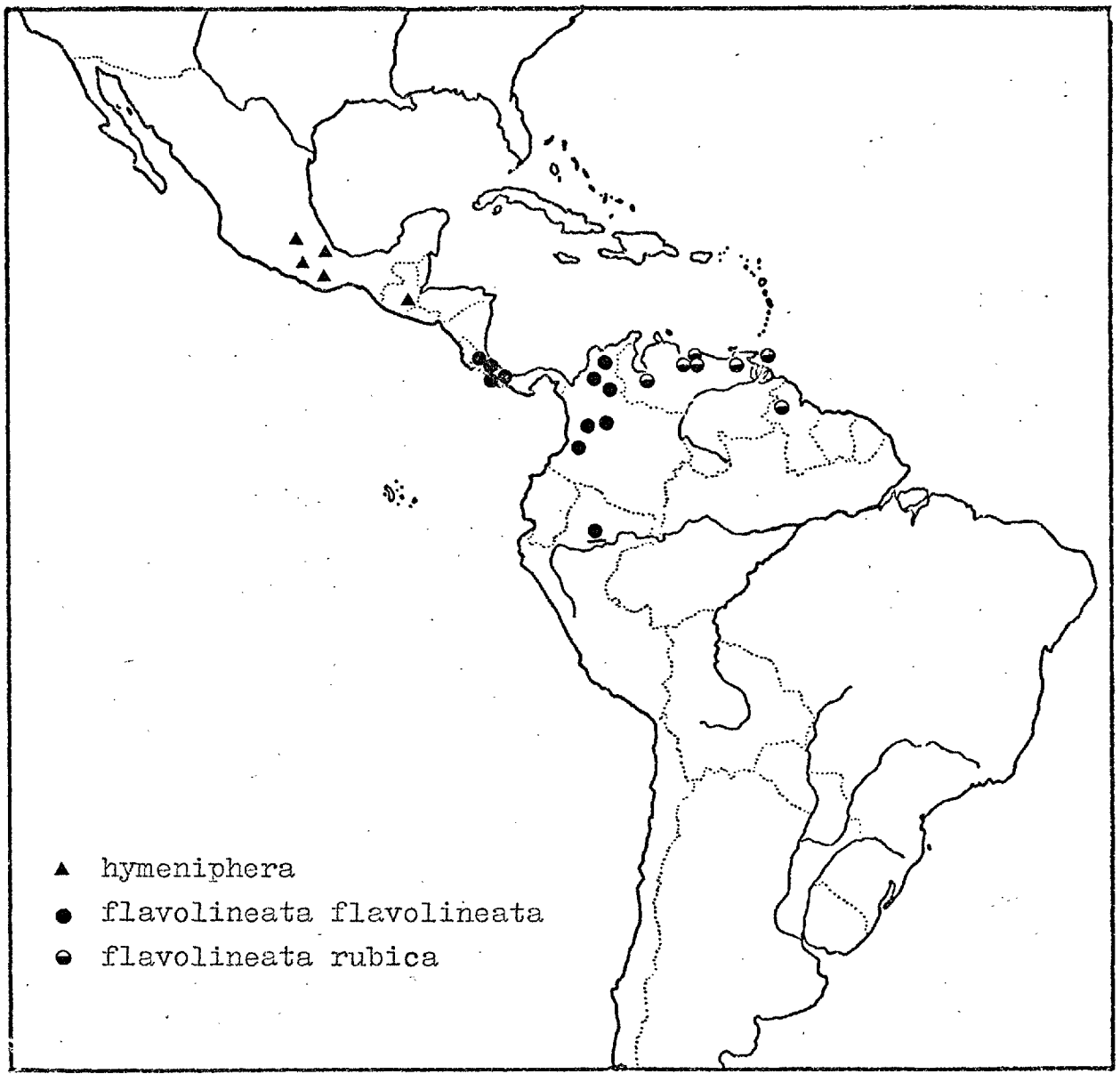
Map 4 Distribution of Tarpeius brevicornis, Baldus vinulus, Chondrocera laticornis and signoreti.



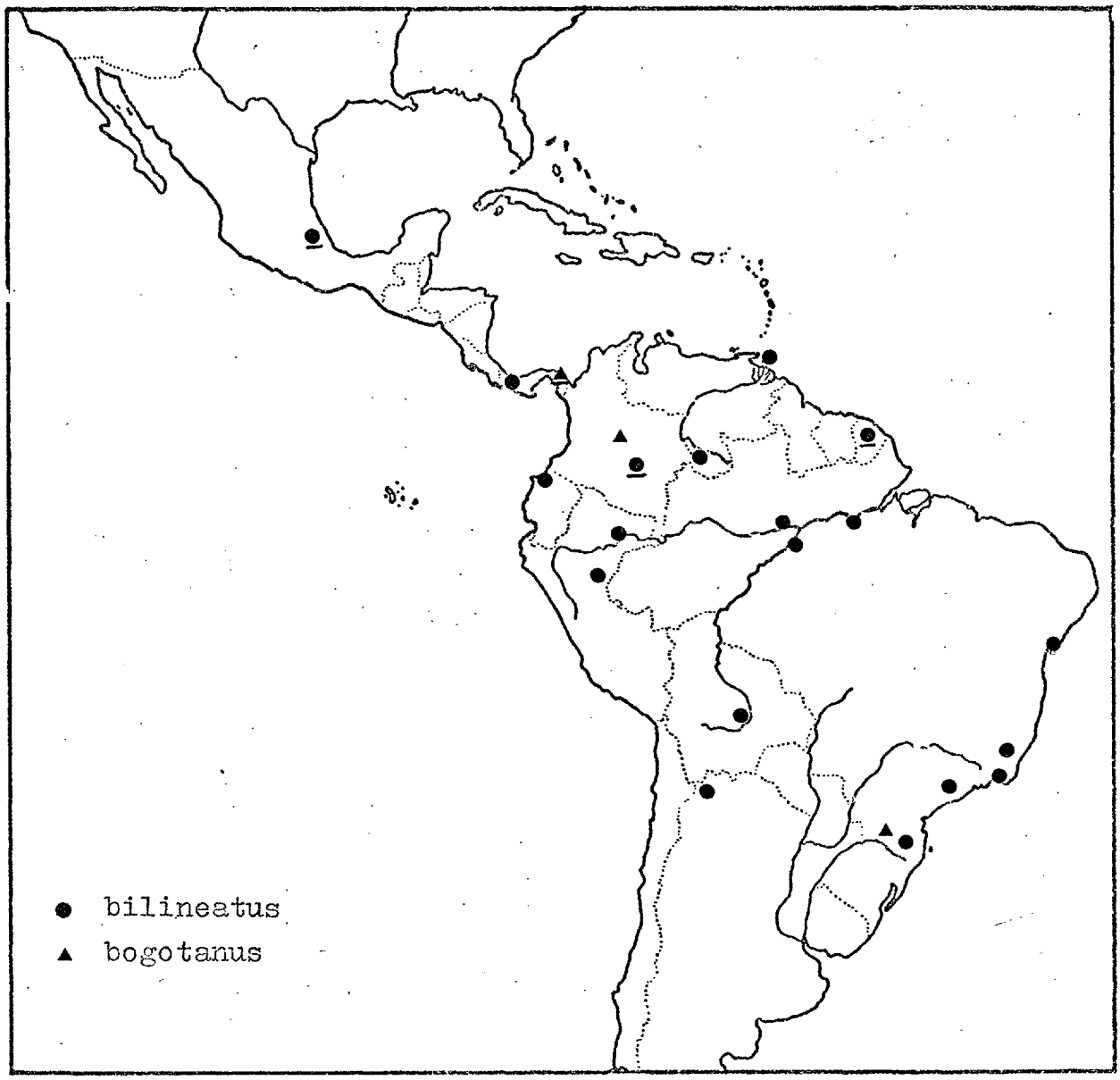
Map 5 Distribution of Anisoscelis foliacea foliacea, f.marginella, discolor and scutellaris.



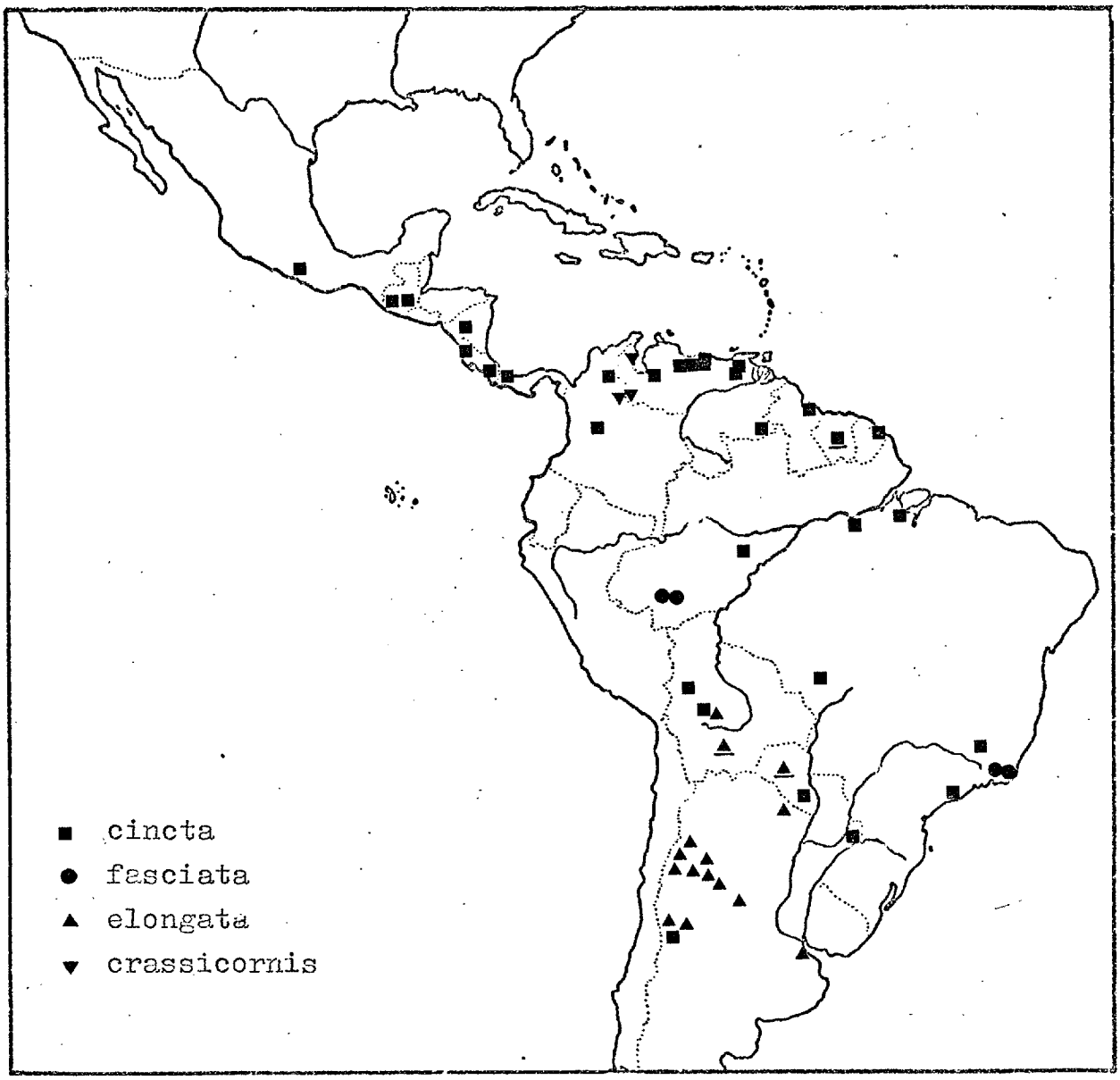
Map 6 Distribution of Bitta affinis, hymana and gradadia.



Map 7 Distribution of Bitta flavolineata flavolineata, f.rubica and hymeniphera.

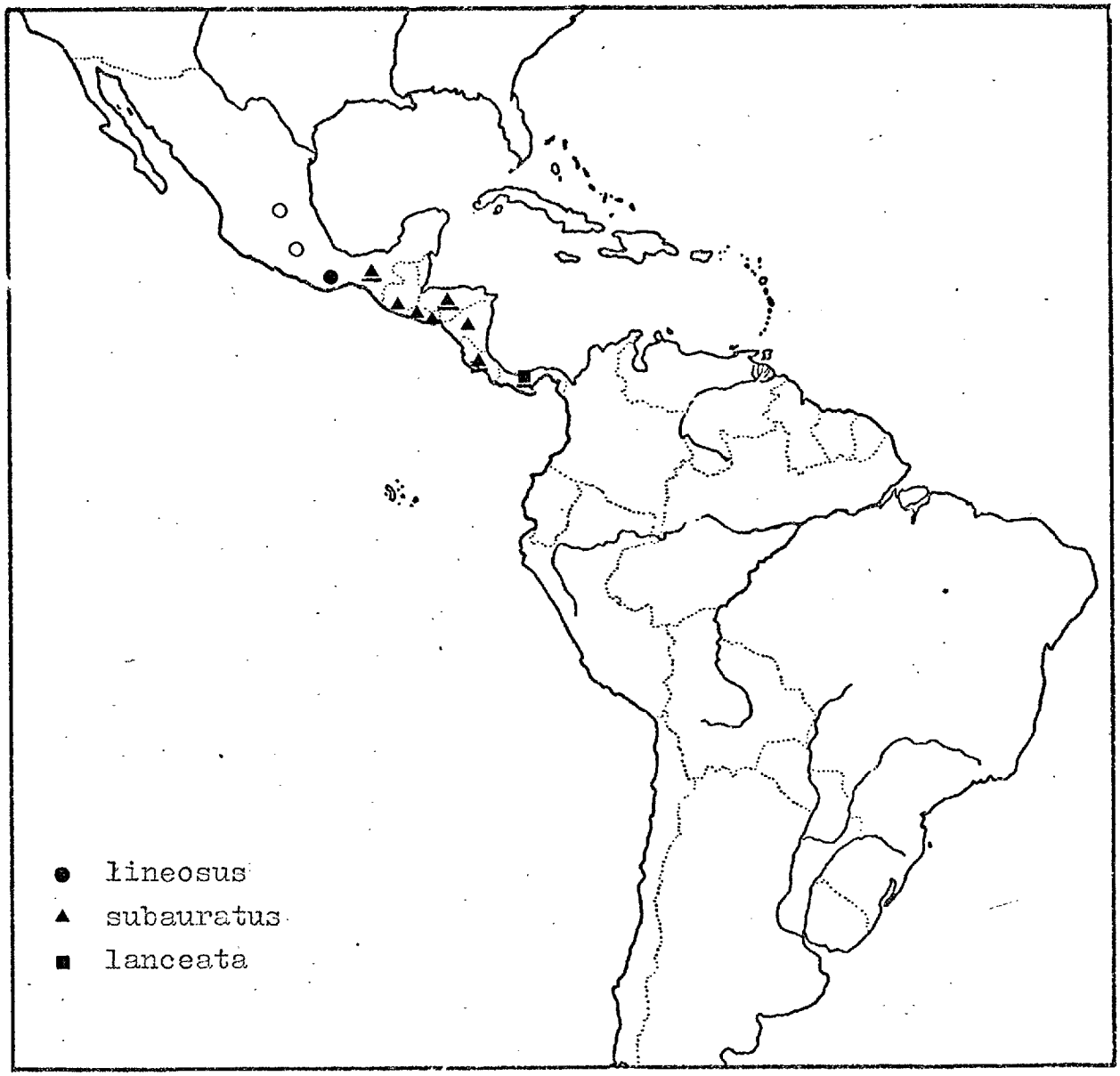


Map 8 Distribution of Diactor bilineatus and bogotanus.



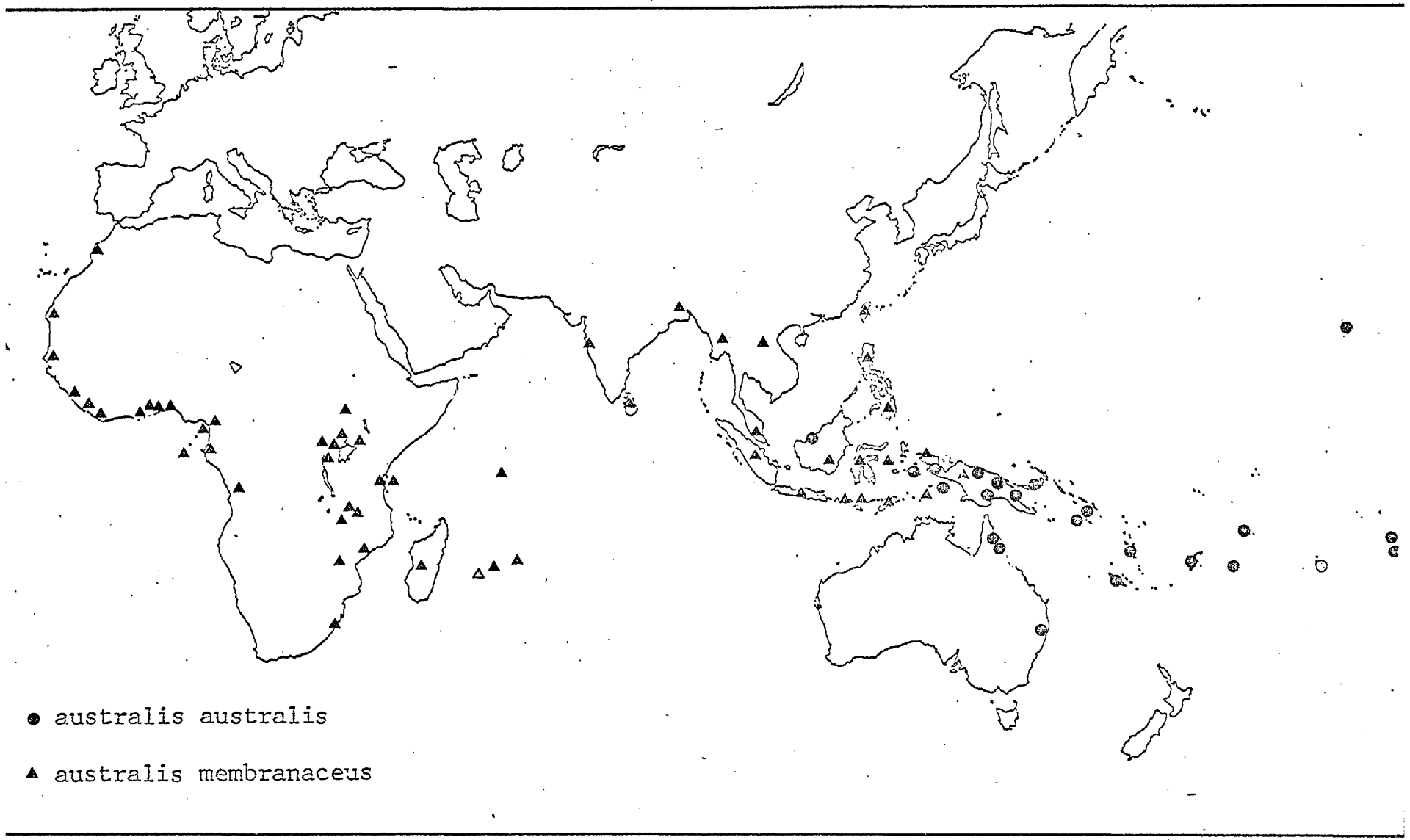
Map 9 Distribution of Stalifera cincta, fasciata, elongata, and crassicornis.

Map 10 Distribution of Narnia femorata and snowi.

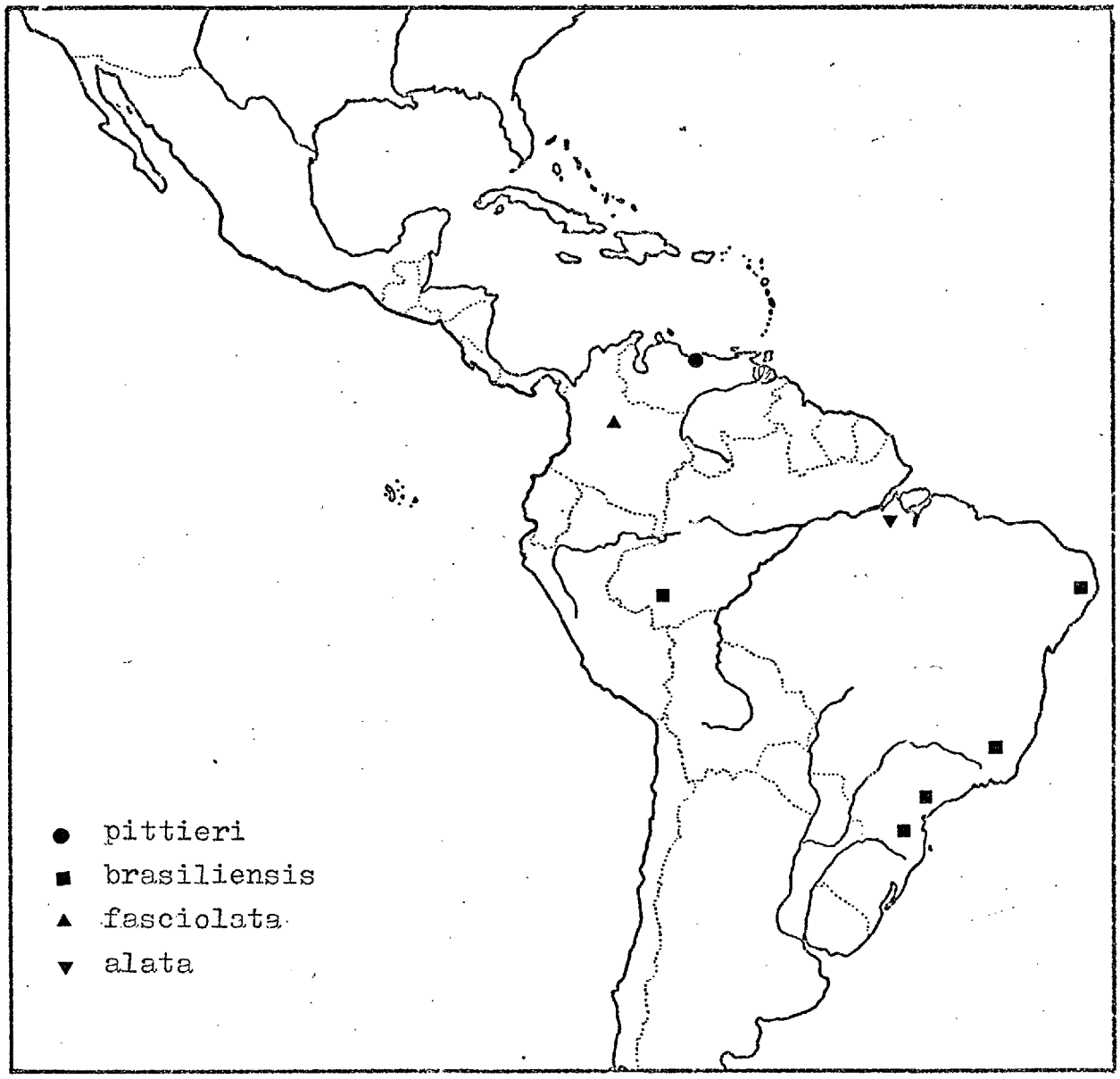


Map 11 Distribution of Theognis lineosus, subauratus and lanceata.

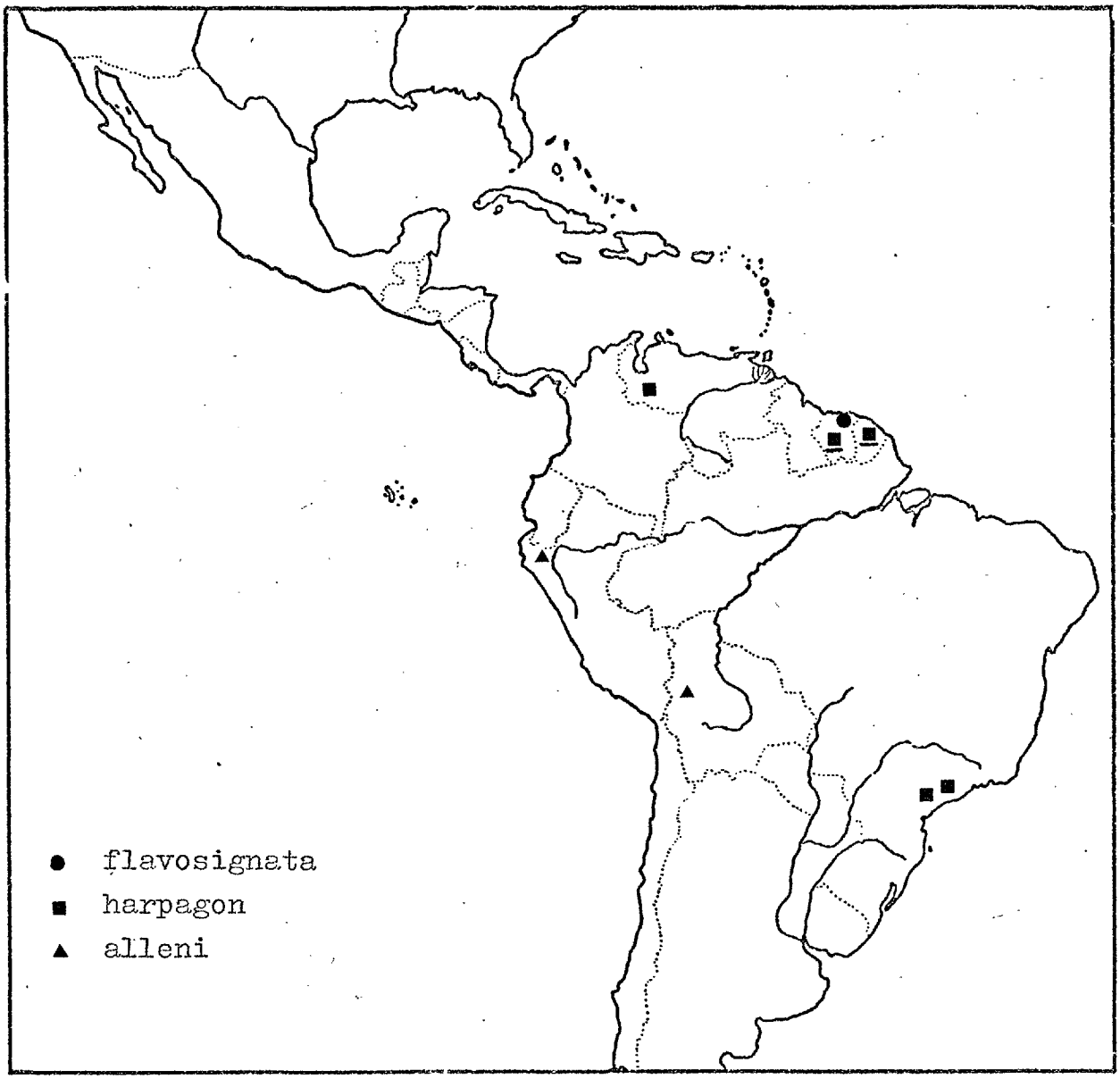
Map 12 Distribution of Fabrictilis gonagra.



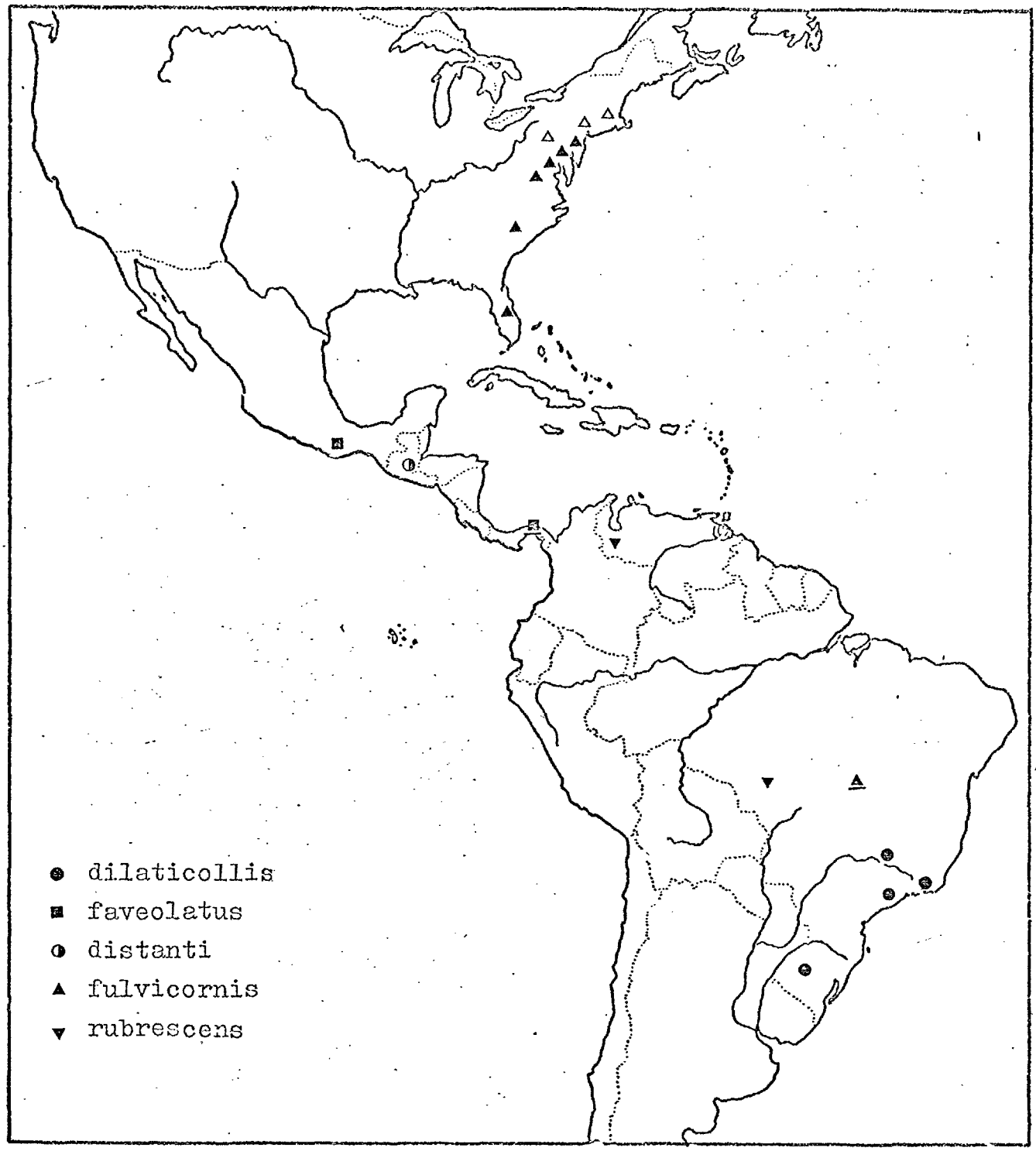
Map 13 Distribution of Fabrictilis australis australis and F. a. membranaceus



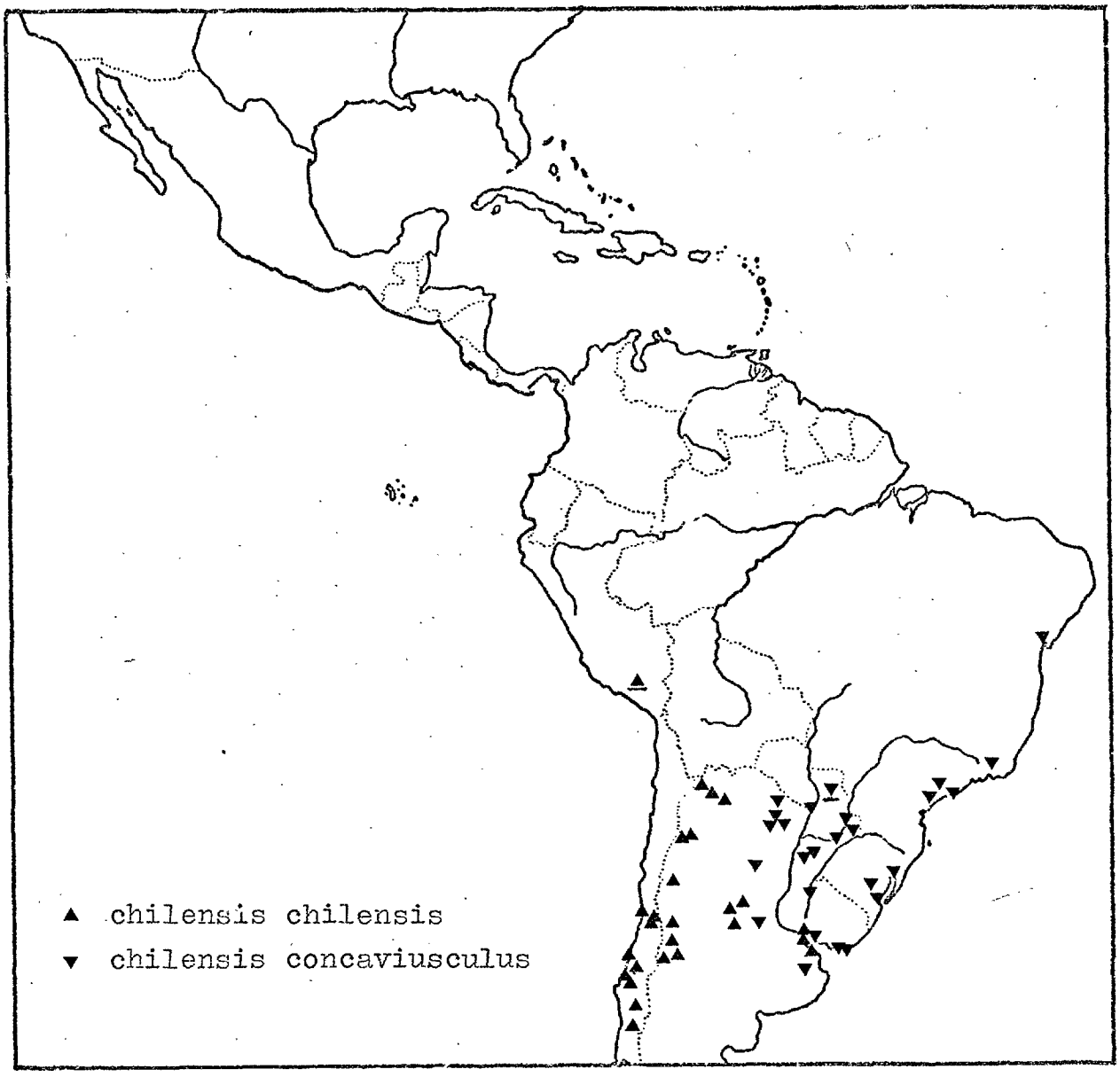
Map 14 Distribution of Microphyllia pittieri, brasiliensis, fasciolata and alata.



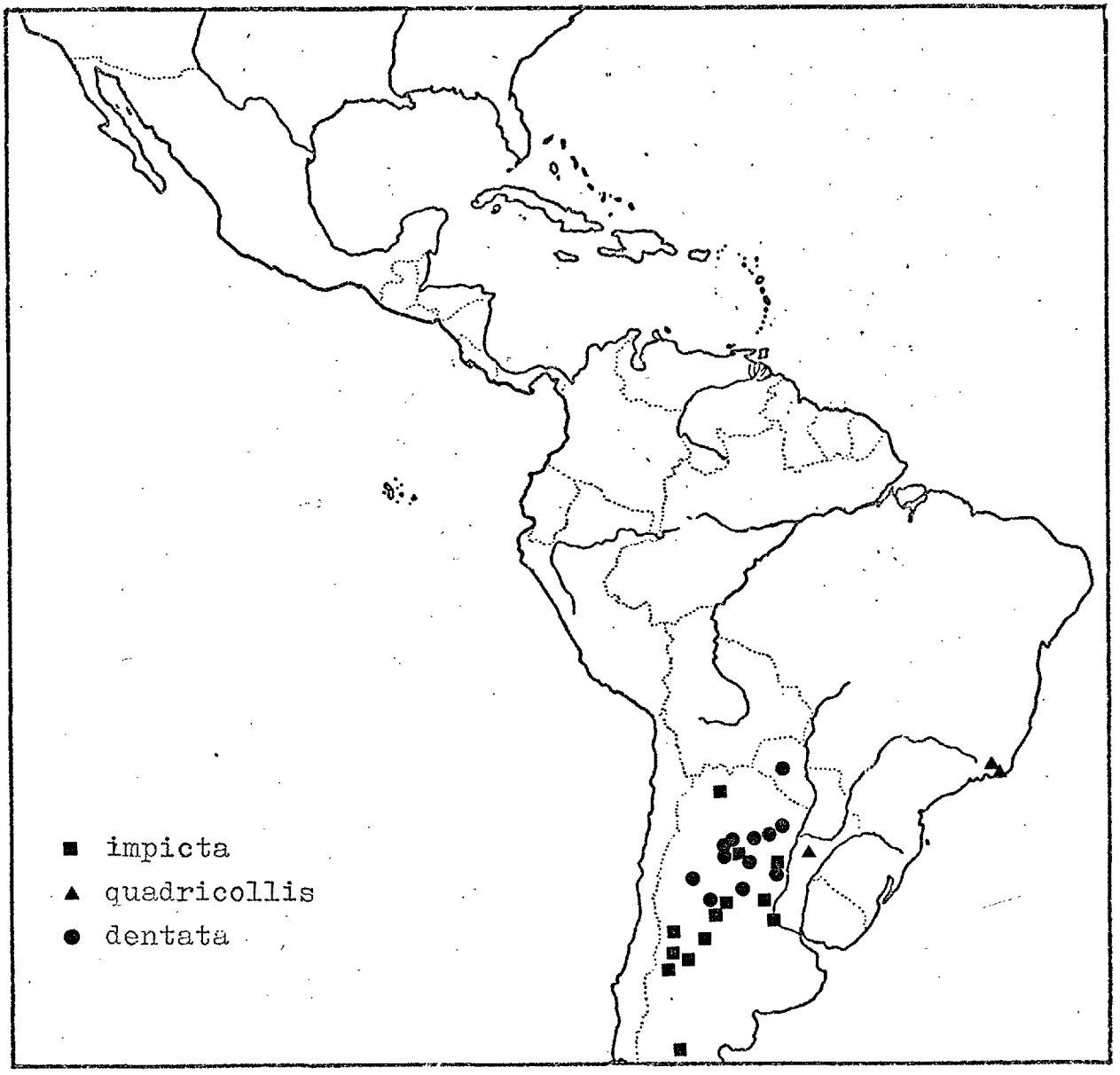
Map 15 Distribution of Microphyllia flavosignata, harpagon and alleni.



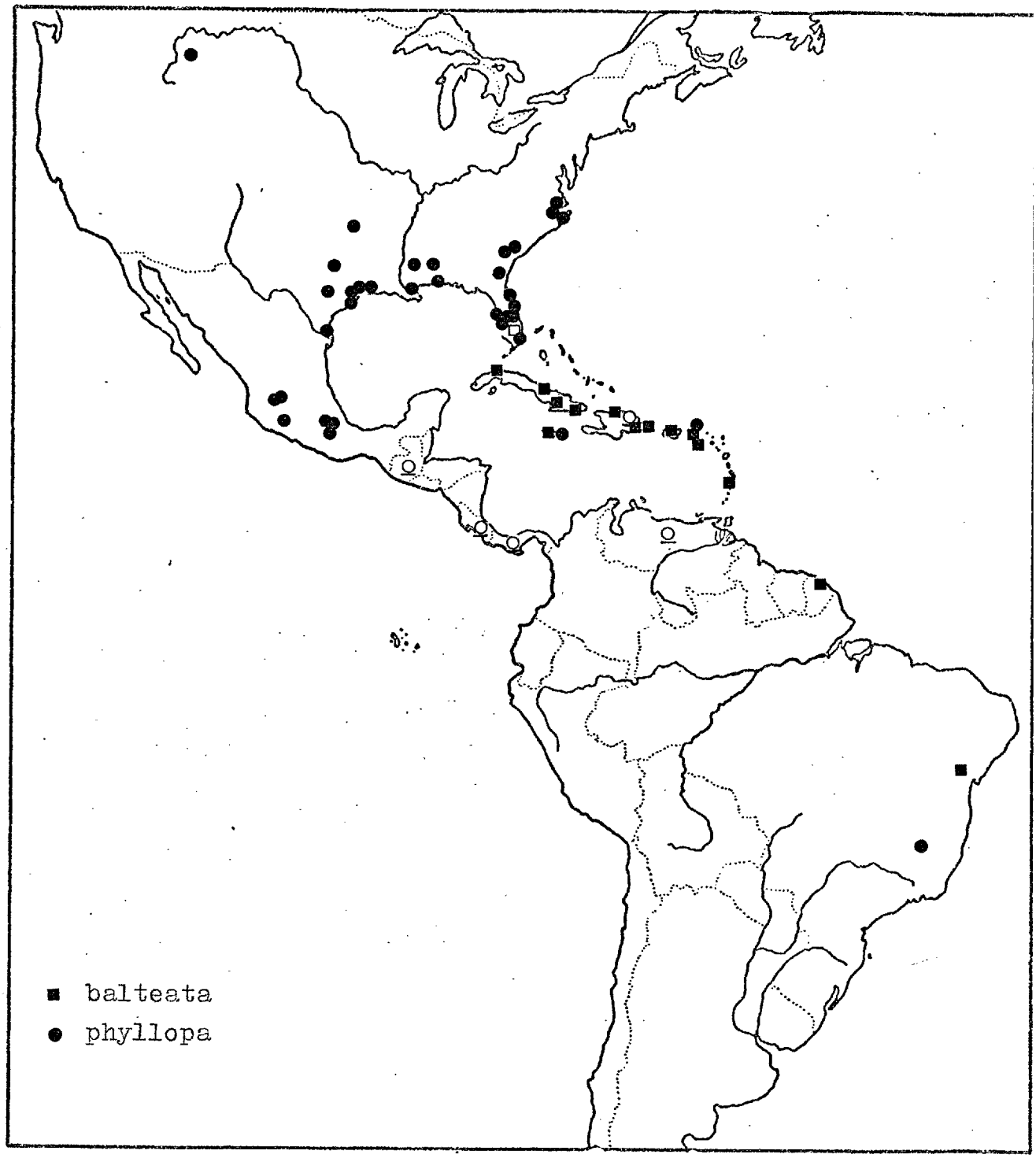
Map 16 Distribution of Leptoglossus dilaticollis, faveolatus, distanti , fulvicornis and rubrescens.



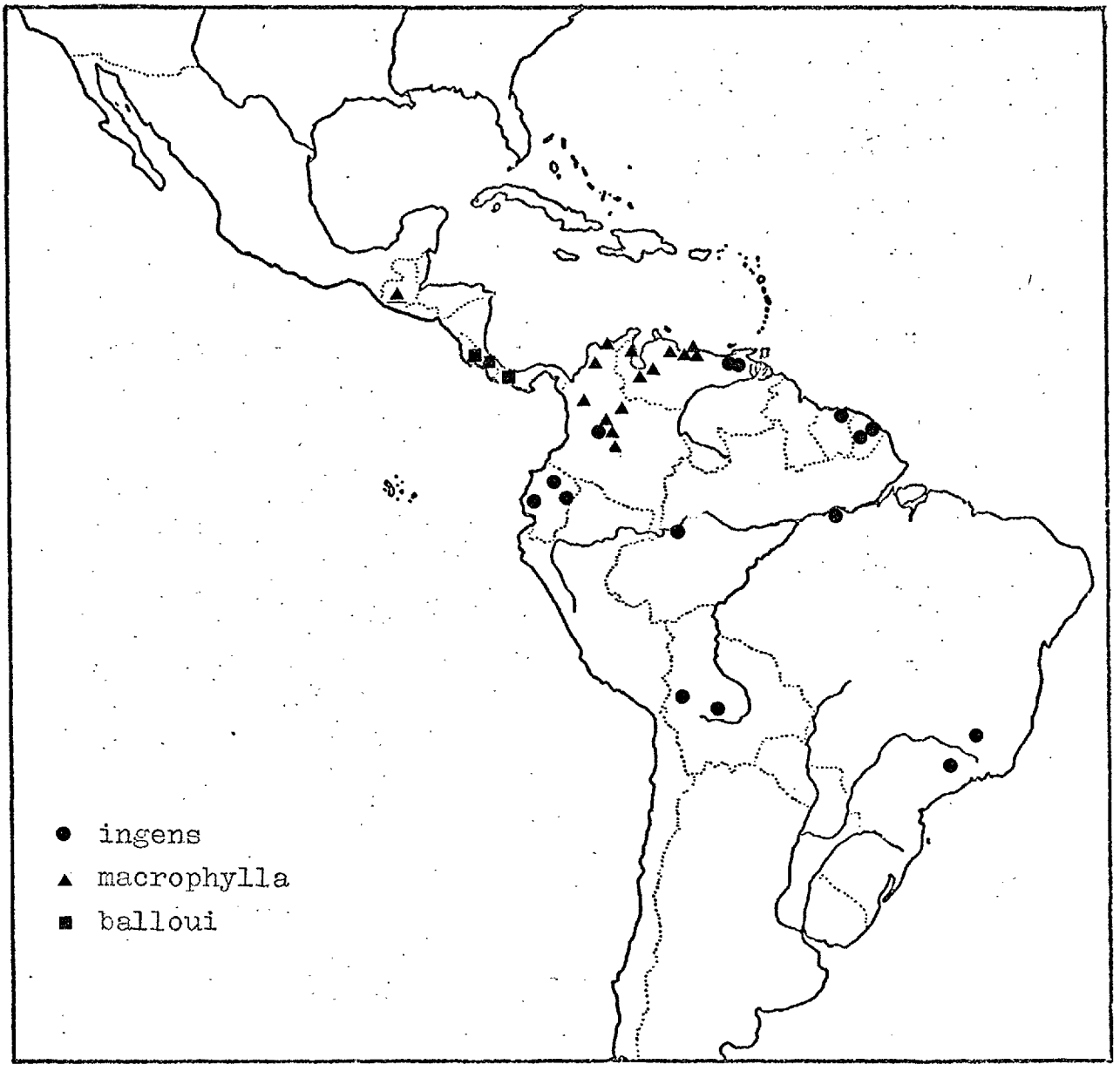
Map 17 Distribution of Veneza chilensis chilensis, ch. concaviusculus.



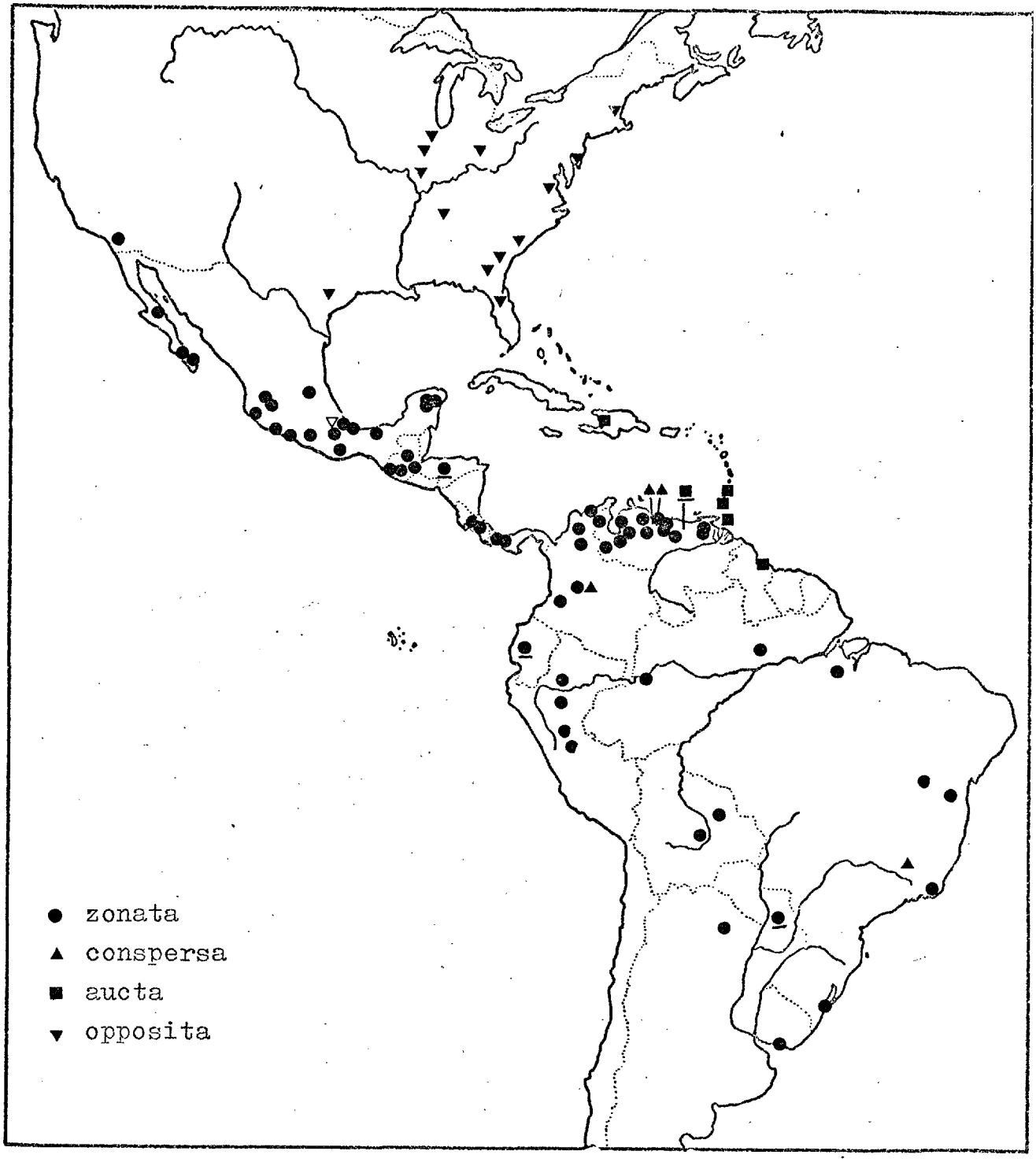
Map 18 Distribution of Veneza impicta, quadricollis and dentata.



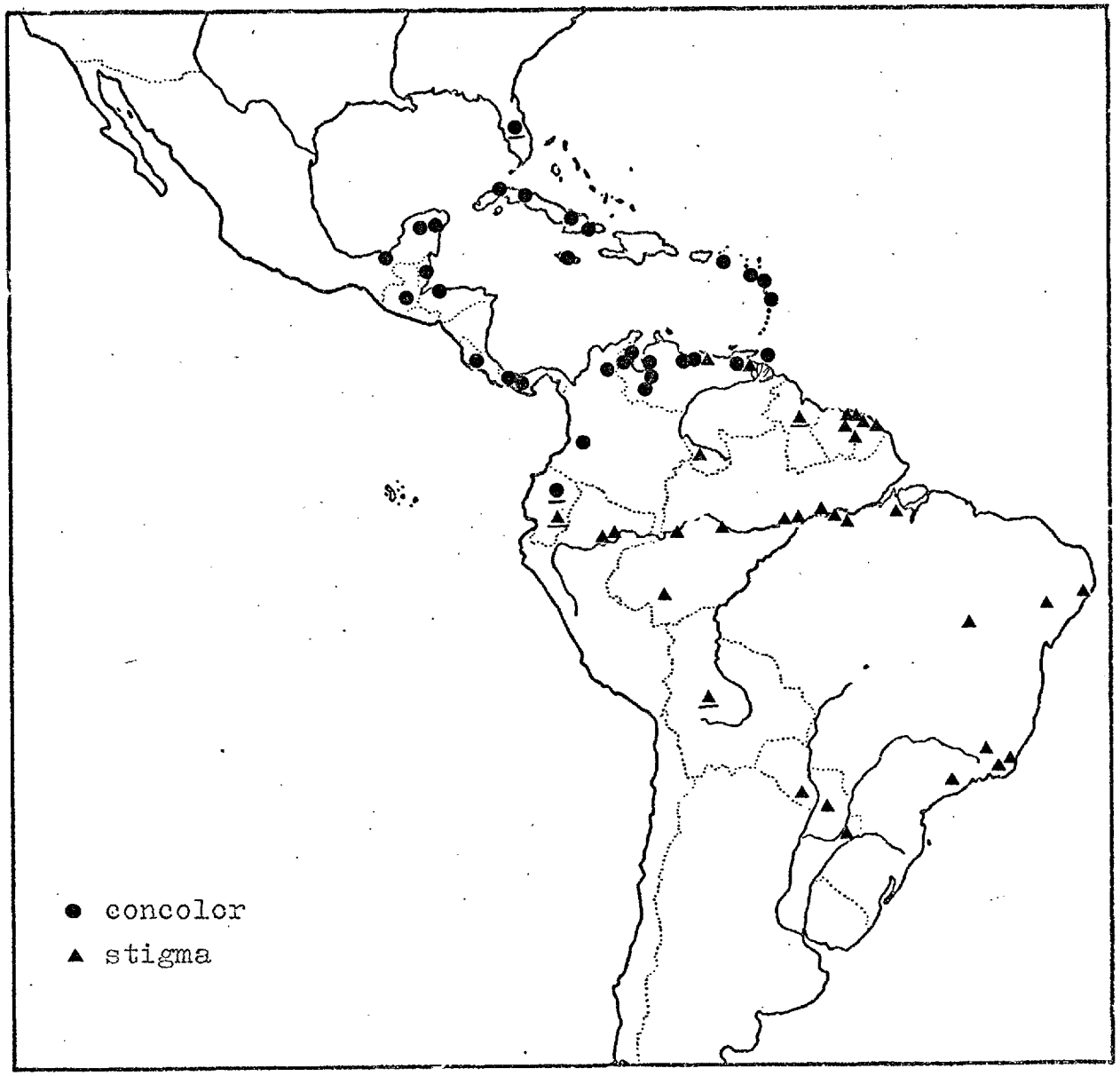
Map 19 Distribution of Veneza balteata and phyllopa.



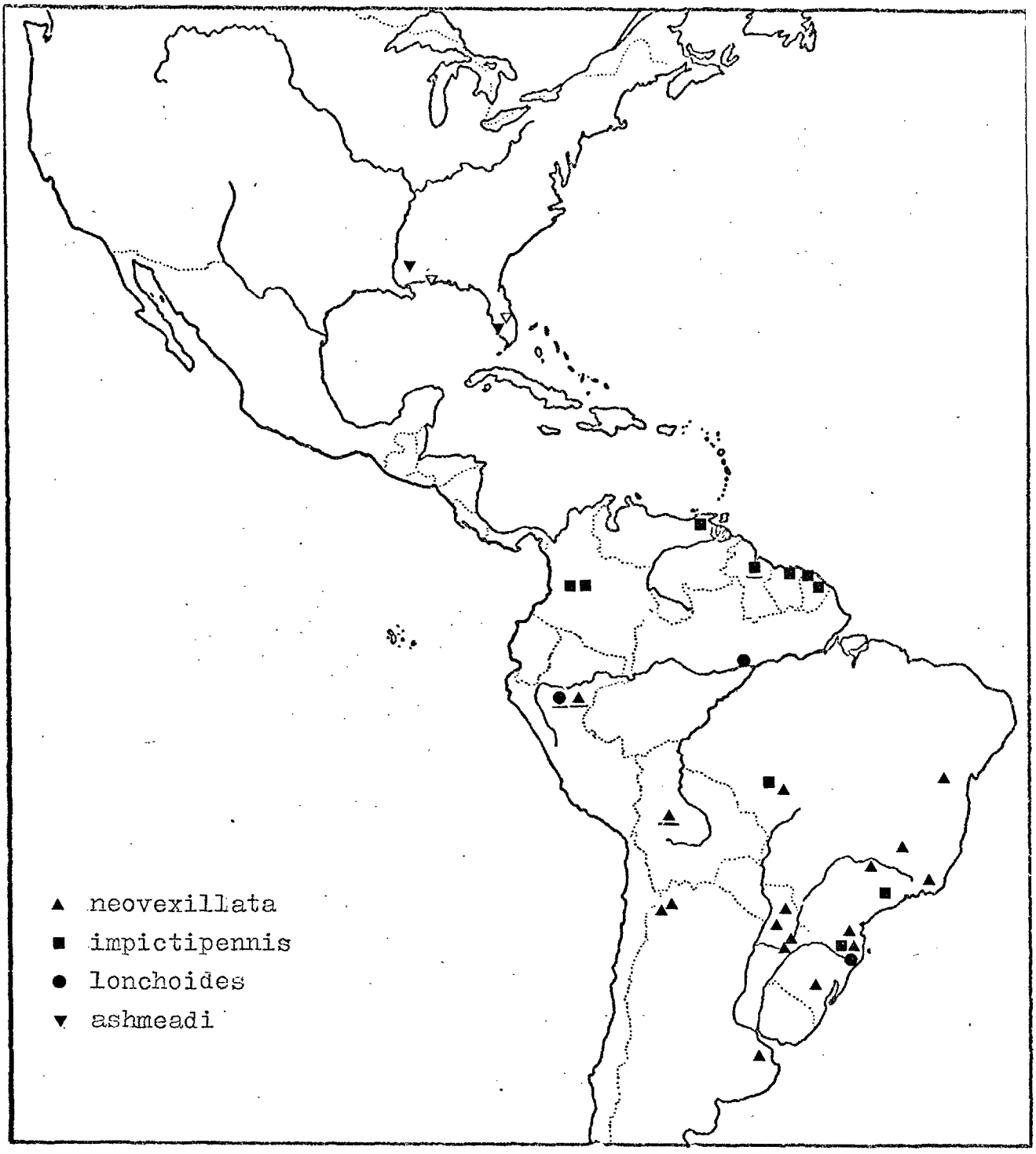
Map 20 Distribution of Veneza ingens, macrophylla and balloui.



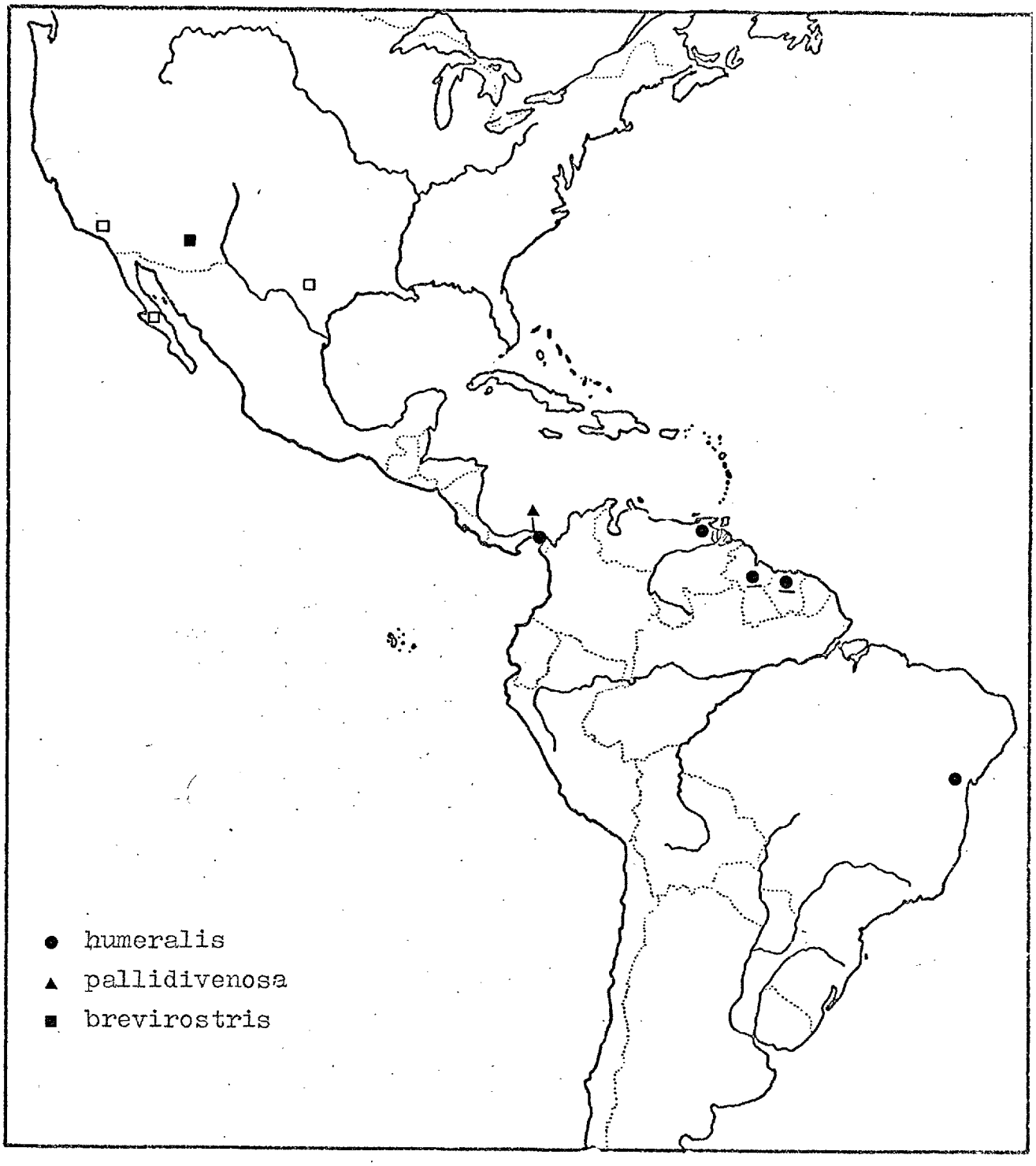
Map 21 Distribution of Veneza zonata, conspersa, aucta and opposita.



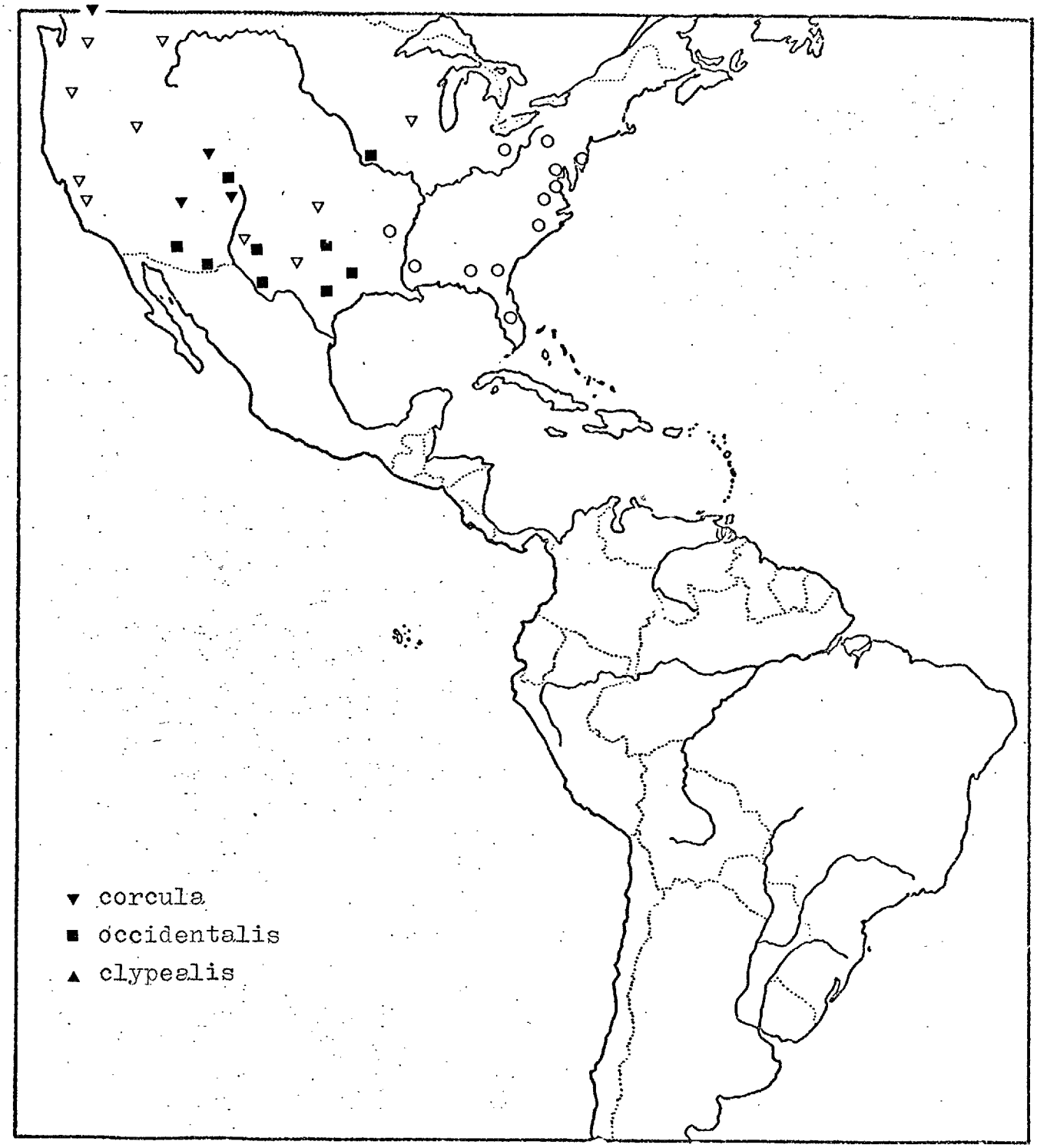
Map 22 Distribution of Veneza concolor and stigma



Map 23 Distribution of Veneza neovexillata, impictipennis, lonchoides and ashmeadi.



Map 24 Distribution of Veneza humeralis, pallidivenosa and brevirostris.



Map 25 Distribution of Veneza corcula, occidentalis and clypealis.