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## STUDIES OF ASILIDAE (DIPTERA) SYSTEMATICS AND EVOLUTION. IV. TRIBE MEGAPODINI CARRERA (DASYPOGONINAE), WITH A REVIEW OF THE NECTROPICAL SPECIES

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### ABSTRACT

*The tribe Megapodini Carrera is considered as a monophyletic group of probable West Gondwanian origin. After the separation of Africa and South America in the Early Cretaceous, the African stock originated the subtribe Lagodiina (with Lagodias Loew and Pegesimallus Loew), while in South America three other subtribes have evolved: Cyrtophryina (with Cyrtophrys Loew and Deromyia Philippi), Senobasiina (with Senobasis Macquart), and Megapodina (with Megapoda Macquart, Pro-*

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nomopsis *Hermann*, and *Pseudorus Walker*). *The American species are reviewed, and considerations on the mechanisms of speciation are made. For the Old World genera only a list of species is furnished.*

## 1. INTRODUCTION

The tribe Megapodini was proposed by Carrera (1949: 5) for the genera *Megapoda*, *Pronomopsis*, *Doryclus*, *Pseudorus*, and *Senobasis*. Hull (1962) gave to that group subfamily rank. Papavero (1973) placed it as a tribe of Dasygogoninae, including in it also the genera *Cyrtophrys*, *Deromyia*, *Lagodias* and *Pegesimallus*. The group, exclusively Guiano-Brazilian and Chilean, before, was then much expanded, including Africa and parts of the Palearctic region.

In this paper a rearrangement of the Megapodini is proposed, and the Neotropical species are reviewed.

## 2. MATERIALS AND METHODS

This paper is based mainly on the collections of the Museu de Zoologia da Universidade de São Paulo (MZUSP); other collections studied were:

AMNH	American Museum of Natural History, New York
BMNH	British Museum (Natural History), London
CAS	California Academy of Sciences, San Francisco
CHM	Collection Charles H. Martin, Tucson
EF	Collection Eric Fisher, Long Beach
FRAN	Natur-Museum und Forschungsinstitut (Senckenberg), Frankfurt-am-Main
JW	Collection Joseph Wilcox, Anaheim
LACM	Los Angeles County Museum of Natural History, Los Angeles
MNRJ	Museu Nacional, Rio de Janeiro
MNHN	Muséum National d'Histoire Naturelle, Paris
OXF	Hope Department of Entomology, Oxford University, Oxford
TORO	Istituto e Museo di Zoologia Sistemática, Università di Torino, Torino
UCB	University of California, Berkeley
USNM	United States National Museum, Washington, D.C.
WIEN	Naturhistorisches Museum, Wien
ZMA	Zoologisch Museum, Amsterdam
ZSBS	Zoologische Sammlungen des Bayerischen Staates, München

Types were examined in 1968 (United States), 1970 (England and France) and 1971-1972 (North American and European Museums).

The systematic portion of this paper was thus organized as regards the information given:

1. For genera: synonymy and bibliographical reference, diagnosis, discussion, key to species. For Old World genera no key to the species is furnished, as those groups are badly in need of revision, which is out of the scope of the present paper;

2. For species: synonymy and bibliographical references, lists of material examined, notes on localities published in the literature, and, if necessary, a brief taxonomic discussion; redescrptions of the species are not given, as the existing original descriptions are satisfactory. As to the Old World genera, only an alphabetical list of species is given, with the original reference, original generic placement (if there was a change), and, according to the case, the general distribution (based on the literature); also when necessary, additional references are furnished.

Descriptions of the genera are largely based on Hull (1962), with the indispensable modifications and corrections; the terminology employed also follows Hull (l. c.), with some modifications, principally the term "metanotum" (cf. Wilcox & Papavero, 1971).

Drawings were made with a camera *lucida*; in drawings of male genitalia hairs and bristles were not represented and the gonopods were shadowed.

Maps were shadowed only for a better visualization of distribution; shadowing does not imply that the distribution is actually as shown or that it is continuous. Localities employed herein for mapping the several taxa comprise those in the labels of the specimens seen, and those published before (including Artigas' 1970 revision). The list of localities were plotted according to data furnished by Vanzolini & Papavero (1968), for Brazil, and according to Hanson (1945), for other countries. When these sources failed, other geographical dictionaries and gazetteers were employed, especially those of the United States Board on Geographical Names.

### 3. ACKNOWLEDGMENTS

Examination of types was rendered possible thanks to a Grant of the John Simon Guggenheim Memorial Foundation, during 1971-72. Previous visits to North American and European museums were undertaken under Grants "Biológicas 68/604" of the Fundação de Amparo à Pesquisa do Estado de São Paulo, and Grant 3289/69 of the Conselho Nacional de Pesquisas.

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#### 4. CHARACTERS OF THE MEGAPODINI

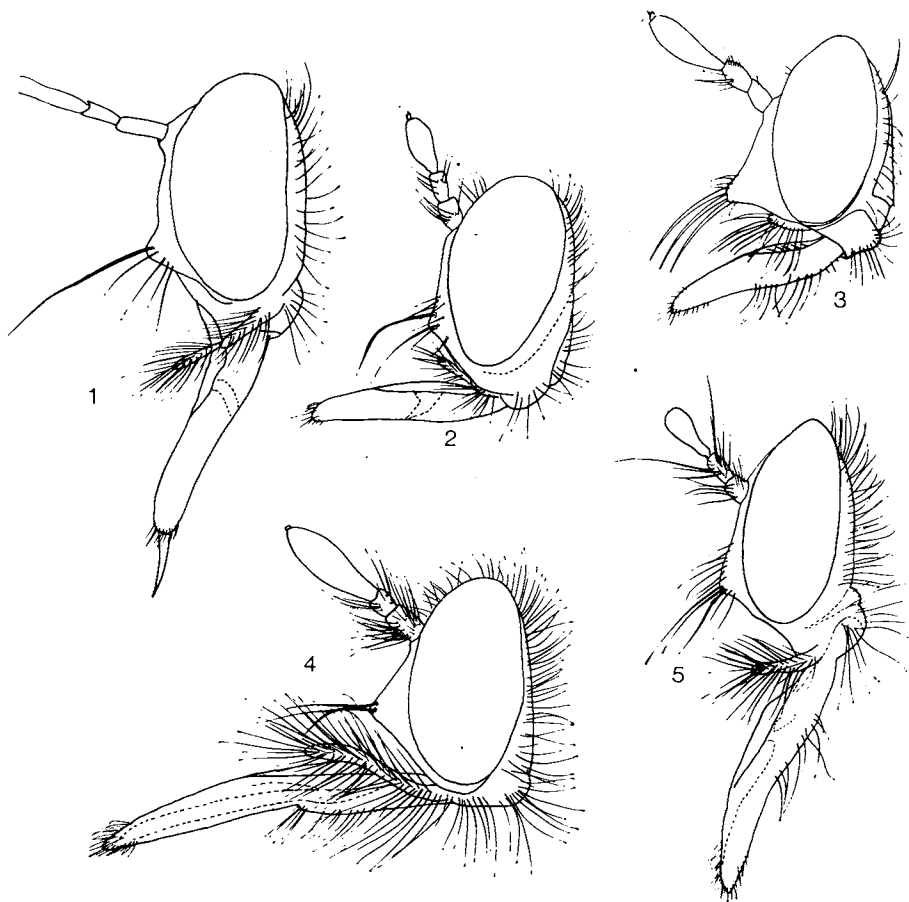
##### 4.1. HEAD

Frontal view: Head always wider than high. *Eyes* large, prominent, generally with the anteromedian portion more or less strongly flattened and facets enlarged (especially in *Pegesimallus*); sometimes eyes expanded at antennal level, the face becoming slightly narrower. *Face* occupying  $1/3$  of the total width of the head (*Cyrtophrys*, *Deromyia*, *Lagodias*, *Pronomopsis*, and *Pseudorus*), being a little more narrow,  $2/5$  of the head's width, in *Pegesimallus*, and only  $1/4$  of the head's width in *Megapoda*; in *Senobasis* it is noticeably narrowed, having only  $1/5$  of the head's width; sides of face generally parallel, sometimes narrowed superiorly, at antennal level, due to an expansion of the eyes (as in *Cyrtophrys* and *Deromyia*); in almost all genera the face is divergent below; in some groups it is projected in the shape of a beak or nose (especially visible in lateral view); in *Lagodias* there are laterodorsal callosities or "bullae", always bare and shining; as to the vestiture, the face may be more or less densely micropubescent (*Cyrtophrys*, *Deromyia*, *Pegesimallus* and *Lagodias*), pubescent or pollinose (*Senobasis*), pollinose on the inferior  $1/3$  (*Megapoda*), or entirely bare and shining, with vitreous reflections (*Pseudorus*); *Pronomopsis* presents a curious central, large, triangular area on the face, the base of the triangle turned towards the antennae, bare, densely pollinose, yellow, which contrasts violently with the black portion around it; *mystax* very reduced, always restricted to epistomal margin, generally with a few bristles (two pairs at most), almost always weak and slender and not very long; *pilosity of face* totally absent (*Cyrtophrys*, *Megapoda*), present only on the inferior  $1/3$  (*Deromyia*), on the inferior  $1/2$  (*Senobasis*), sparse all over the facial surface, except immediately below antennae, or yet laterally placed, with 10-12 hairs, the lower ones longer (in *Lagodias*), very dense (*Pegesimallus*), limited to a few slender, long and sparse hairs laterally placed (*Pseudorus*), or dense, laterally placed, with a few short hairs on the sides of the central area (as in *Pronomopsis*). *Subepistomal area* (oral cavity) generally large (small in some species of *Lagodias*), concave, bare, sometimes shining, with or without a median keel; when present, the median keel is not very prominent; in *Senobasis* the keel is replaced by a sulcus, weakly pronounced; in some species of *Pseudorus* (as *dimidiatus* and *piceus*) there is a profound sulcus laterally to the subepistomal area, next to the anteroventral angle of the eyes, similar

to that found in the genus *Acronyches* Williston (Stenopogoninae). *Front* variable — distinctly convex, bare and shining, with a narrow pubescent stripe along the orbital margins and scarce hairs, in *Cyrtophrys*, the convexity extending beyond the vertex, tapering towards the occipital foramen, where it ends in an acute angle; in *Deromyia* the front is short, wider than the face, convergent towards the apex, micro-pubescent on the inferior part, bare and shining in the remainder, with small lateral bristles in the region comprised between the antennal level and the ocellar callosity; in *Lagodias* it has the same width of the face, presenting sometimes some longitudinal sulci, or yet submedian "bullae", with laterally placed pilosity; in *Pegesimallus* it is wide, pollinose, with dense covering of bristly and slender hairs; in *Megapoda* the front is short, with the same width of the face, with lateral callosities or "bullae" and a lateral tuft of bristles; in *Pronomopsis*, short, depressed, with longitudinal sulci and a dense group of bristles and bristly pile laterally, diagonally placed, beginning near the antennae; in *Senobasis* the front is flattened, slightly divergent towards the apex, pollinose, with long, bristly hairs laterally; in *Pseudorus* it is generally as wide as the face, with longitudinal sulci, the pilosity from very strong to a few fine and scarce hairs, or totally bare (*hermanni* Carrera). *Ocellar tubercle* generally large, moderately prominent in *Cyrtophrys* and *Deromyia*, and prominent in different degrees in the other genera, with the lateral walls generally straight, and pilosity restricted to a small number of hairs on the posterior slope of the tubercle. *Vertex* moderately excavated, with straight sides in *Cyrtophrys*, *Deromyia*, and *Lagodias*; deeply excavated in some species of *Lagodias*; narrow, with convergent sides, in *Megapoda*; slightly divergent and excavated in *Senobasis*; deeply excavated in *Pronomopsis*; in *Pseudorus* it is excavated, sometimes very deeply (as in *holcocephalinus*, sp. n.), with vertical walls; in other species of *Pseudorus* it is ample, continuing behind through an elevation, triangular in form, which extends to the occipital foramen, tapering gradually, and which brings on top the ocellar tubercle, much like as in *Cyrtophrys*.

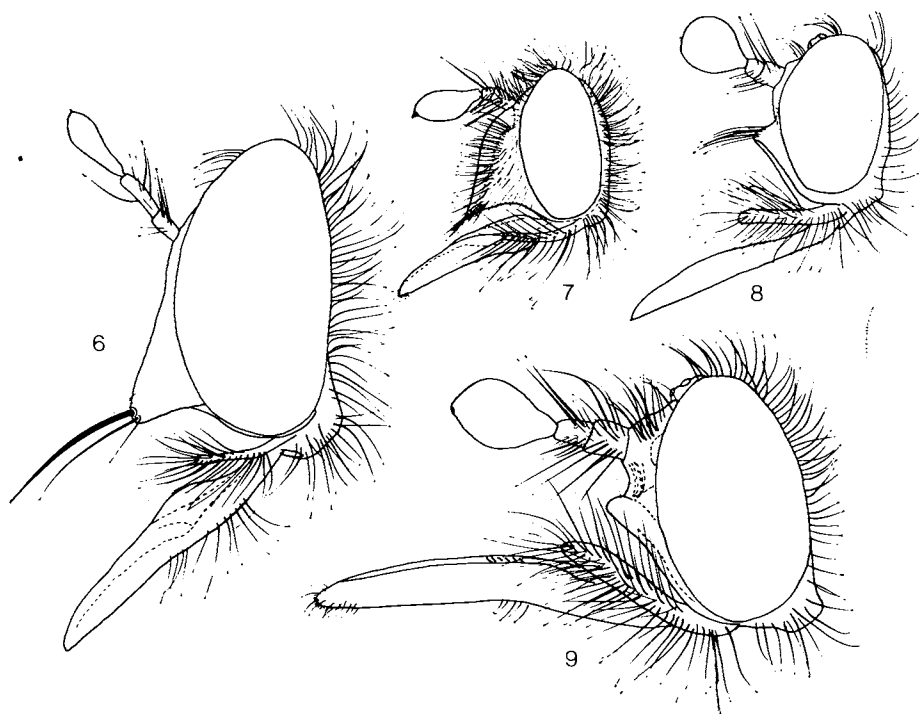
Lateral view: *Face* nearly plane, slightly elevated, with a shallow submedian concavity and a small projection on the epistomal margin in *Cyrtophrys* (Fig. 1); short, similar to the preceding, but with projection on epistomal margin and submedian concavity less pronounced, in *Deromyia* (Fig. 2); moderately prominent, more so on the epistomal margin, slightly convex or sub-bullose laterally, or prominent through all its extension, especially inferiorly, in *Lagodias* (Fig. 3); prominent, slightly convex, in *Pegesimallus*; not very prominent, almost plane, short above, gradually more prominent below (Fig. 5), or, in some species, forming a beak or nose above and almost plane ventrally (especially noticeable in *bromleyana*, Fig. 6), in *Senobasis*; prominent, in profile almost triangular, in *Megapoda* (Fig. 4); noticeably prominent, subtriangular in profile, prolonged into a curious beak, acute on the apex, with a central yellow area bare of hairs, in *Pronomopsis* (Fig. 7); weakly prominent, very short, concave medianly, projected into a thick and short lip on the epistomal margin, in *Pseudorus* (Figs. 8-9). *Occiput* not developed, almost invisible in profile; in *Cyrtophrys* moderately

convex, especially medianly and inferiorly, recessive at the superior margin of the eyes, pollinose, with slender, long, and scarce hairs, and one pair of bristles on the post-vertical callosity, superodorsally placed (Fig. 1); in *Deromyia* the occiput is only developed medianly and inferiorly, due to the recessive eyes; it is tomentose, with short scarce hairs and has one pair of superodorsal bristles (Fig. 2); in *Lagodias* (Fig. 3) it is similar to the preceding, but sometimes with the superior pilosity stronger; in *Pegesimallus* the occiput is developed only medianly, whence it continues gradually towards the inferior margin of the eyes, almost invisible in profile, with moderately slender and abundant hairs, reduced on the median portion, where they are replaced in great part by fine bristly pile, more developed on the ventral portion of the occiput; in *Senobasis* it is slightly concave, with long and fine pilosity starting far



Heads, lateral view: 1, *Cyrtophrys attenuatus* (Loew); 2, *Deromyia fuscipennis* (Blanchard); 3, *Lagodias* sp. (India); 4, *Megapoda labiata* (Fabricius); 5, *Senobasis ornata* (Wiedemann).

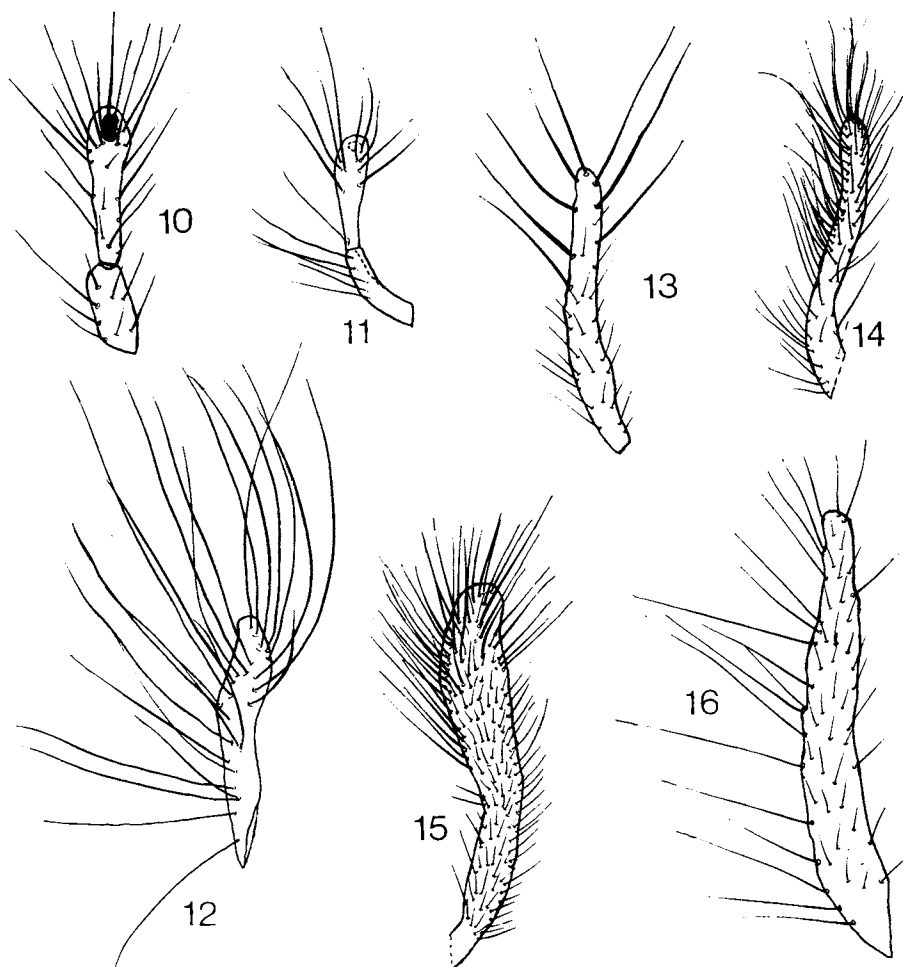
away from the eye margin (Fig. 5), or occiput invisible except at the ventral region (Fig. 6); in *Megapoda* (Fig. 4) it is obliterated, somewhat more visible on the ventral 1/4, with scarce pilosity and some stronger bristles dorsally; in *Pronomopsis* it is moderately thick, less prominent near the vertex, with some short and thick hairs and slender bristles (Fig. 7); the occiput is weakly prominent, almost invisible in profile, with proclinate pilosity, in *Pseudorus* (Figs. 8, 9). *Eye* straight posteriorly, except ventrally and apically, convex anteriorly, in *Cyrtophrys* (Fig. 1) and *Deromyia* (Fig. 2), in the latter with a strong ventral recess; it is ovoid in *Lagodias* (Fig. 3); comparatively short, somewhat narrower on the dorsal half, moderately convex anteriorly and slightly convex posteriorly, in *Pegesimallus*; it is moderately flattened anteriorly, wider posteriorly, in *Megapoda* (Fig. 4); of medium size, more or less oblique, straight posteriorly, in *Pronomopsis* (Fig. 7) and *Senobasis* (Figs. 5-6); wider inferiorly, straight posteriorly, in *Pseudorus* (Figs. 8-9). *Proboscis* very variable: slightly longer than the length of the face, directed downwards, strongly compressed laterally, somewhat larger towards the base, with a rounded apex, the dorsal keel more or less evident, with a few fine hairs apically and ventrally near the base, in *Cyrtophrys* (Fig. 1); distinctly longer than the length of the face, laterally compressed, obtuse on the apex, with almost the same width throughout its extension, more slender basally and apically, with well



Heads, lateral view: 6, *Senobasis bromleyana* Carrera; 7, *Pronomopsis rubripes* Hermann; 8, *Pseudorus dandrettae* Carrera; 9, *Pseudorus distendens* (Wiedemann).

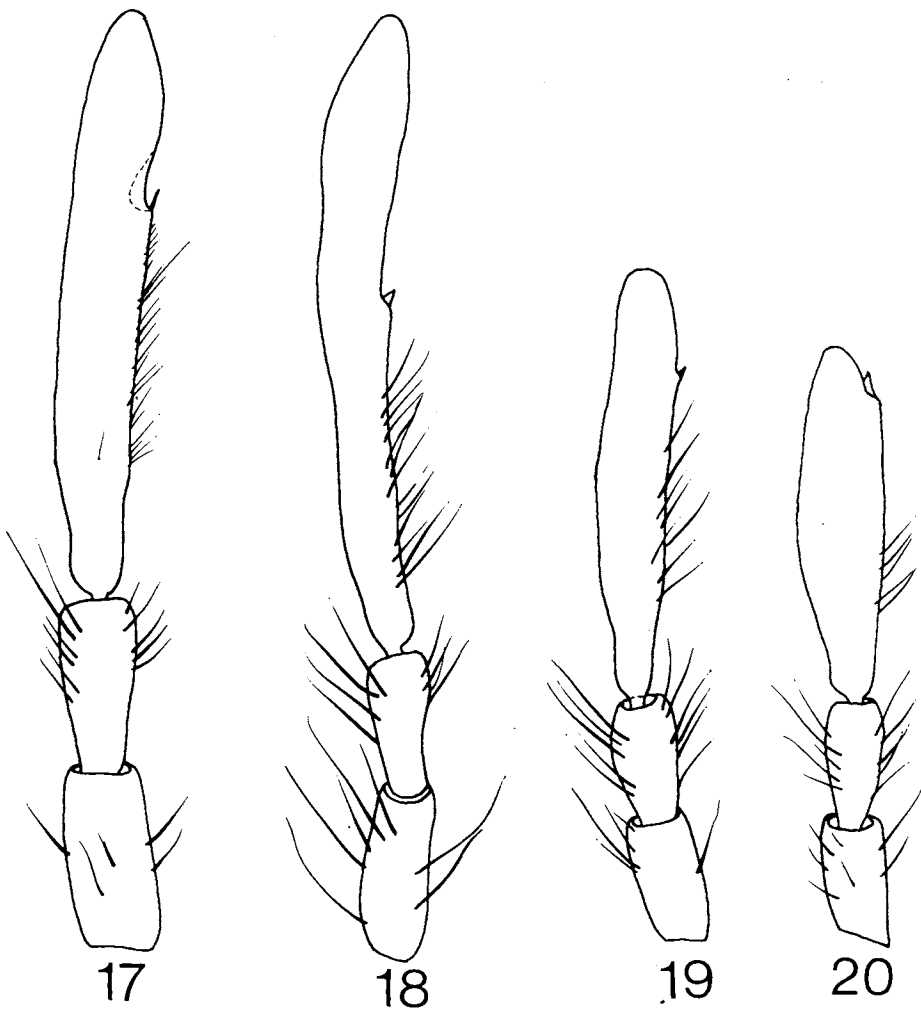
evident dorsal keel, and a few weak hairs apically and ventrally, in *Deromyia* (Fig. 2); moderately or very long, strongly compressed laterally, with dorsal keel, short and fine hairs apically, long and fine hairs ventrally, at the base, in *Lagodias* (Fig. 3); directed obliquely forward and downward, laterally compressed, with dorsal keel exceptionally high and prominent, confined to basal portion, thence decreasing towards the apex, apex and ventroapical  $1/5$  with numerous and slender hairs and a row of transverse bristly hairs (4 hairs), occupying the median and ventral surfaces, in *Pegesimallus*; proboscis very long, directed downwards, laterally compressed, apex more or less acute, dorsomedian keel arising abruptly on the basal  $1/4$  and continuing beyond the middle, basal and ventral surface with long and fine and sparse hairs, in *Senobasis* (Figs. 5-6); in *Megapoda* (Fig. 4) exceptionally long, laterally compressed, with median constriction, directed forward, convex on the basal half of ventral surface and on the apical half of the dorsal surface, the apex obtuse, with short and fine hairs on the apex and long and fine ones on the basal half of the ventral surface; in *Pronomopsis* (Fig. 7) longer than face, strongly compressed laterally, straight, directed forward and downward, dorsally arcuate, concave ventrally, with a prominent dorsal keel, especially noticeable on the basal  $1/3$ ; apex more or less acute, with long hairs on the base, ventrally; in *Pseudorus* (Figs. 8-9) the proboscis is very long, longer than the height of an eye (up to twice the eyes' height), strongly compressed laterally, narrow at base, becoming immediately wider, and then tapering towards the apex, or very slender, with almost parallel sides; dorsomedian keel beginning on basal  $1/5$  and not surpassing the middle of proboscis, or yet not visible, or then going to the apex (as in *hermanni* Carrera); apex with short and fine hairs, base without hairs or bristles ventrally. *Palpi*: with 2 segments (*Cyrtophrys*, *Deromyia*, *Pegesimallus*, and some species of *Lagodias*), or reduced to only 1 segment (some species of *Lagodias*; *Senobasis*, *Pronomopsis*, *Megapoda*, *Pseudorus*); in *Cyrtophrys* (Fig. 10) the two palpal segments of same length, clavate, the basal segment excavated, the apical with pore, covered with numerous long bristles; in *Deromyia* (Fig. 11) the two segments are subequal, the basal one excavated, with some long hairs on the ventral surface, the second long, clavate, with apical pore and a tuft of apical bristles laterally; in *Lagodias* with 1 or 2 segments, the first shorter, more evidenced in specimens with the palpus bent in right angle — this segment is excavated, partially fused with the apical one; second segment long, cylindrical, somewhat constricted medianly, with numerous long hairs, with or without apical pore; pilosity short and long apical bristles on the sides (Fig. 12); in *Pegesimallus* the first segment is short, excavated, the second longer, cylindrical, with numerous long, slender bristles on all sides and on the apex; in *Megapoda* the single segment is undulated, long, surpassing the face, cylindrical, without apical pore (Fig. 14); in *Pronomopsis* it has only 1 segment, large, long, cylindrical, slightly sigmoid, with almost half the length of the proboscis, with several strong bristles on the apex and on the ventral surface, and bristly pile dorsally; in *Senobasis* it is prominent, long, subsigmoid, cylindrical, of only 1 segment, sometimes with vestiges of the basal segment, with numerous bristly and long hairs





Palpi: 10, *Cyrtophrys attenuatus* (Loew); 11, *Deromyia fuscipennis* (Blanchard); 12, *Lagodias* sp. (India); 13, *Senobasis claripennis* (Schiner); 14, *Megapoda labiata* (Fabricius); 15, *Pseudorus distendens* (Wiedemann); 16, *Pseudorus dandrettæ* Carrera.

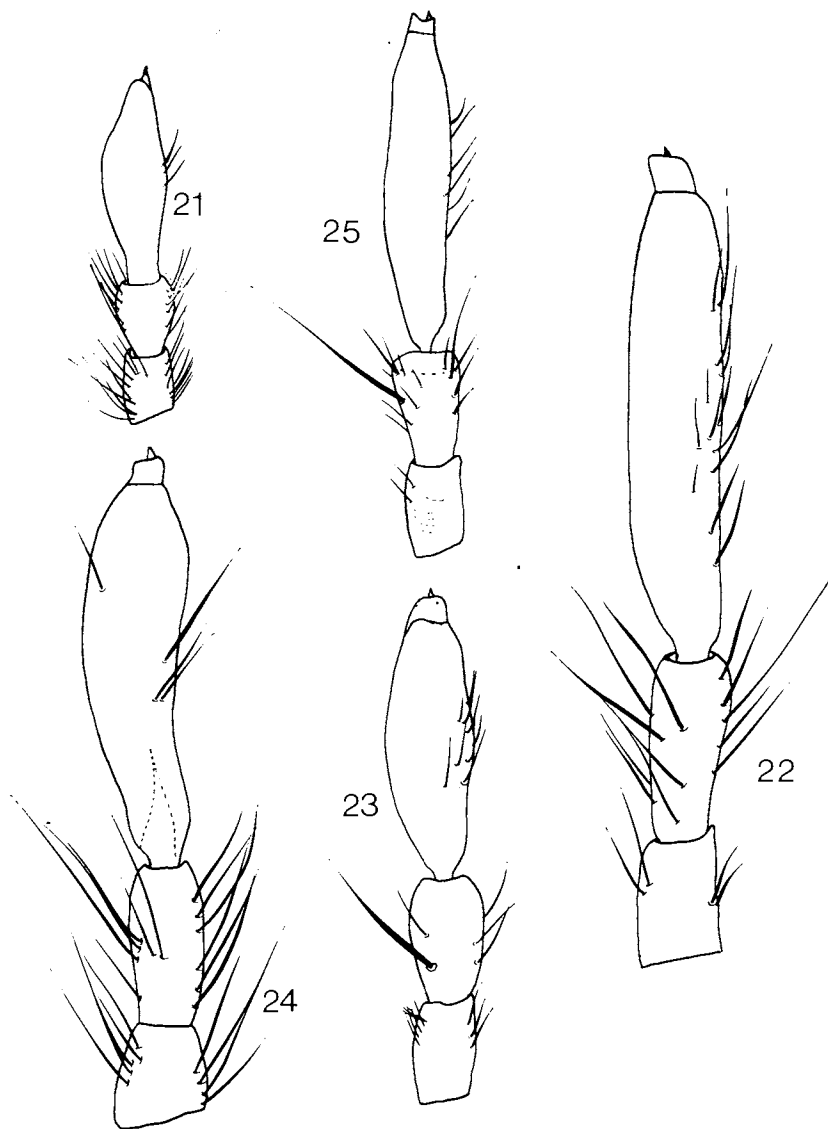
on all sides, except medianly, these hairs becoming stronger towards the apex (Fig. 13); in *Pseudorus* the palpus has only 1 segment, long, surpassing the face, cylindrical, sometimes with acute apex, totally covered by fine and long bristles (Figs. 15-16). *Antennae*: in *Lagodias* placed above the middle of the head (Fig. 3), of moderate length, the first segment slightly shorter than the second, the third from 1.5 to 2 times longer than the basal two together, greatly expanded dorsoventrally before the middle, and then again tapering towards the apex; apical microsegment short, conical, apically truncate; first and second segments



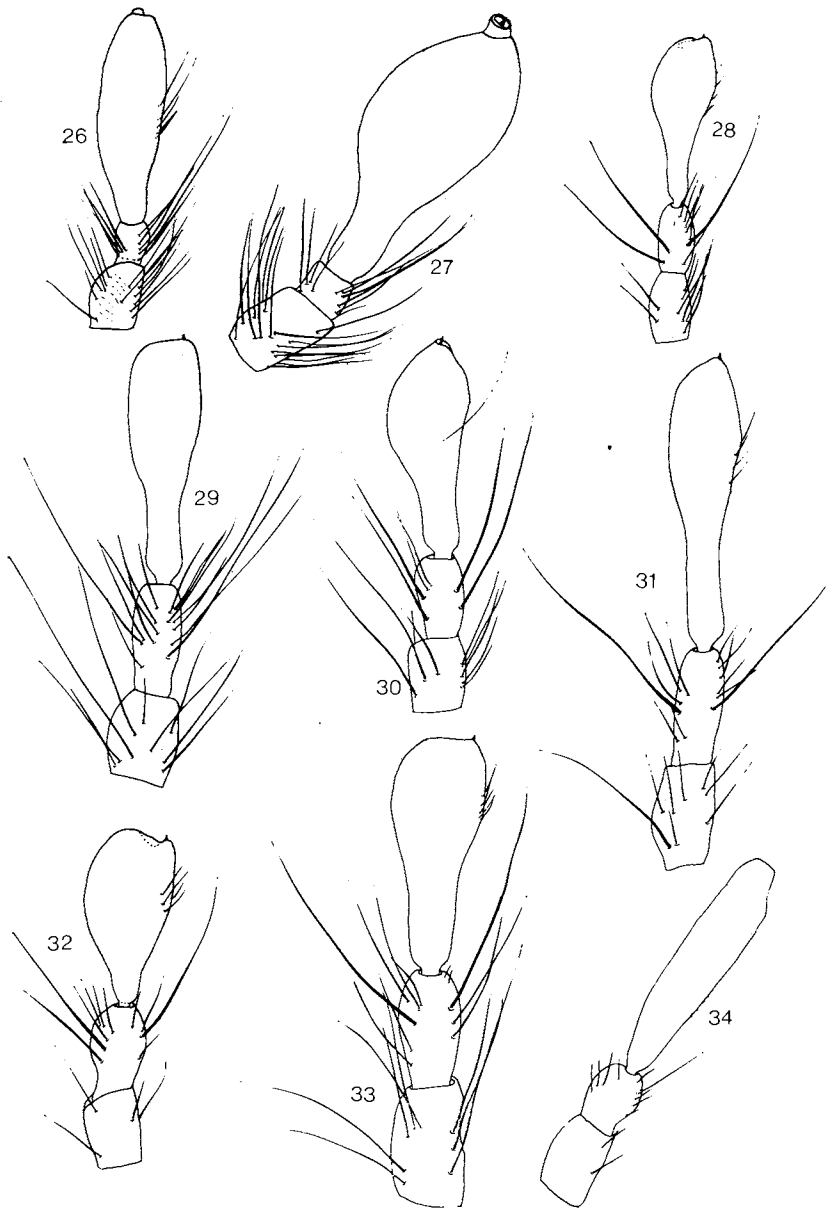
Antennae of *Cyrtophrys*: 17, *albimanus* (Carrera); 18, *attenuatus* (Loew); 19, *facialis* Curran; 20, *lynchii* (Brèthes).

with bristles ventrally and dorsally; the third with several long bristles dorsomedianly (Figs. 22-25); in *Pegesimallus* the antennae are placed on the superior 1/4 of the head, moderately long, the first segment almost as long as the second, the third 1.5 times as long as the basal two together, laterally compressed and considerably enlarged on the external half, attenuate basally and abruptly shortened at the apex; apical microsegment short, with a minute spine; first antennal segment with some bristly hairs, moderately long, ventrally and dorsally; the second with similar bristles and some stronger ones; third with 10-12 dorsal bristles, moderately long; in *Deromyia* the antennae are placed on the superior

1/3 of the head, shorter than the head's length, the basal two segments subequal, with numerous bristly hairs on the dorsal and ventral surfaces; the third segment almost as long as the basal two together, strongly dilated at the middle, with a noticeable apical microsegment, conical, bearing a strong spine; third segment with a group of 3-4 bristles dorsally (Fig. 21); in *Cyrtophrys* the antennae are placed on the

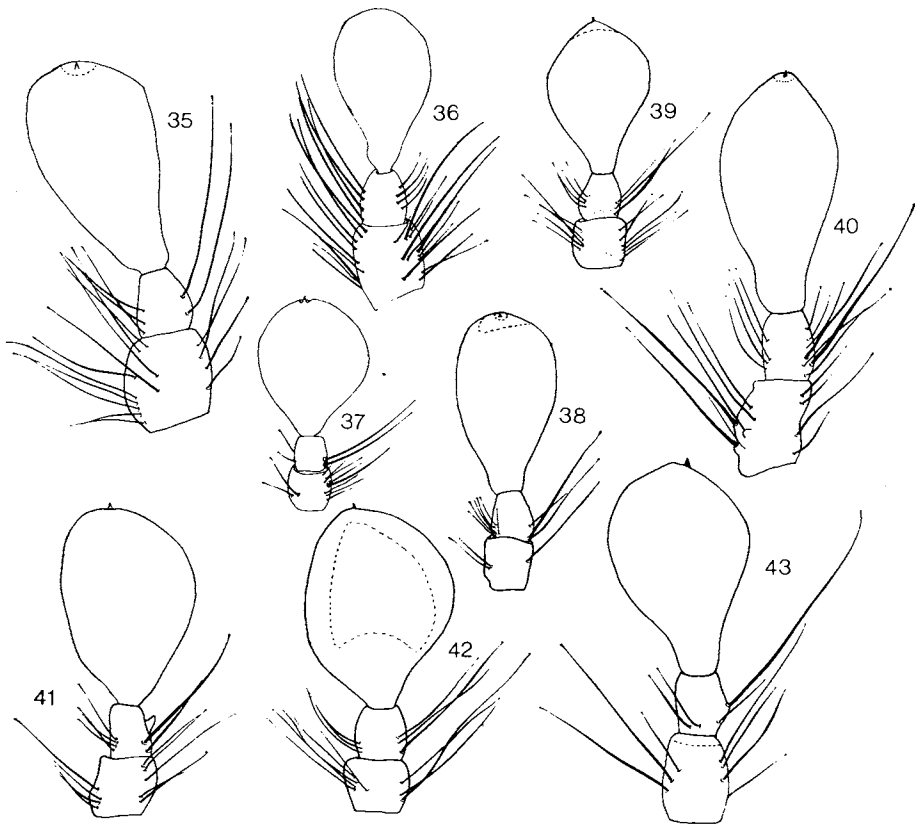


Antennae: 21, *Deromyia fuscipennis* (Blanchard); 22, *Lagodias funestus* (Loew); 23, *Lagodias* sp. (India); 24, *Lagodias teratodes* Hermann; 25, *Lagodias trifasciatus* (Oldroyd).



Antennae: 26, *Megapoda labiata* (Fabricius); 27, *Pronomopsis rubripes* Hermann; 28, *Senobasis analis* Macquart; 29, *Senobasis corsair* Bromley; 30, *S. flukei* Carrera; 31, *S. lanei* Carrera; 32, *S. mundata* (Wiedemann); 33, *S. ornata* (Wiedemann); 34, *S. notata* (Bigot).

superior 1/3 of the head (Fig. 1), being approximately as long as the head and very slender; first and second segments with the same length, the first almost cylindrical, the second slightly wider at apex, third segment variable: 3 times longer than the basal two together, slender, with approximately the same thickness in all its extension, rounded (obtuse) on the apex, presenting a median and dorsal recession bearing a minute spine, in *attenuatus* (Loew) (Fig. 18), or clavate, laterally compressed, subequal to or 1.5 times as long as the basal two segments together, with the recession nearing the spine located on the apical or subapical 1/6 of the third segment, dorsally and subapically, as in *lynchii* (Fig. 20), *albimanus* (Fig. 17) and *facialis* (Fig. 19); in all species the third antennal segment has several oblique bristles on the dorsal surface; in *Megapoda* the antennae are placed on the superior 1/4 of the head (Fig. 4), the first segment being longer than the second, and



Antennae of *Pseudorus*: 35, *bicolor* Bellardi; 36, *distendens* (Wiedemann); 37, *dandrettæ* Carrera; 38, *hermanni* Carrera; 39, *holcocephalinus*, sp. n.; 40, *martini*, sp. n.; 41, *piceus* Walker; 42, *dimidiatus* Oldroyd; 43, *rufiventris* (Roeder).

the third twice as long as the basal two together, oval, more attenuate on the basal half, apex flattened, with a flattened apical microsegment, which is more or less fused to the third antennal segment, only the rim remaining, laterally, and a projection in form of a collar, dorso-medially, with a short spine in the middle; first and second segments with long bristles, dorsally and ventrally; third with a few bristly hairs, more or less short, medianly and dorsally placed (Fig. 26); in *Pronomopsis* the antennae are located on the superior 1/5 of the head (Fig. 7), the first two segments robust, the second shorter, the third 1.5 times as long as the basal two together, attenuate on the base, dilated in the remainder, and wider on the apical 1/3, with a short, conical microsegment bearing a dorsal spine; first and second segments with numerous long bristly hairs, on all sides, except in the middle; the middle of the second segment with at least one long and strong bristle (Fig. 27); in *Senobasis* the antennae are placed on the superior 1/3 of the head, short in relation to the antennae of the other genera, generally equal to or shorter than an eye's height; first and second segments subequal, and together not so long as the third, with a few long and strong bristles ventrally and 1 or 2 dorsally on the second, in addition to bristly hairs; third antennal segment strongly attenuate at base, clavate, with variable shapes, apically only with a pit and a more or less hidden spine (Figs. 28-34); finally, in *Pseudorus*, the antennae are implanted on the superior 1/3 of the head (Figs. 8-9), the first two segments subequal, the first larger than the second and cylindrical, the third attenuate basally, ovoid or discoidal, with a minute apical pit bearing a spine; first and second segments with ventral and dorsal bristles; the dorsal ones more developed and stronger; third segment bare (Figs. 35-43). *Cervicalia* (Figs. 44-49) more or less elongate in all genera, in *Cyrtophrys* (Fig. 44) longer, keeping the head well separated from the thorax; this occurs, to a lesser extent, in *Deromyia* and *Megapoda* (Fig. 46).

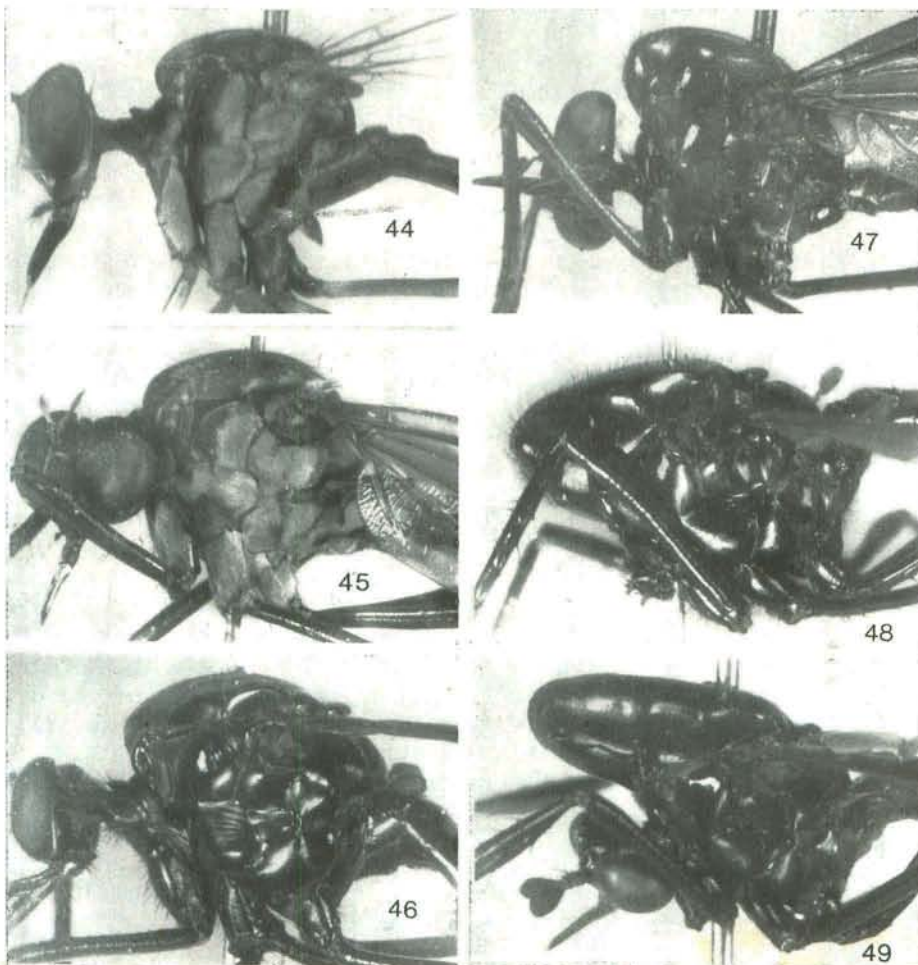
#### 4.2. THORAX

*Prosternum*: small and dissociated in all genera.

*Pronotum*: shining, with scarce pollinosity, in *Cyrtophrys*; developed, with fine and scarce pilosity laterally, fuscous and pollinose, in *Deromyia*; with short and fine hairs in *Lagodias* and *Pegesimallus*; with a dorsal, transversal sulcus, and numerous fine and bristly hairs, the anterior portion deeply separated from the posterior one, forming a kind of lip, in *Megapoda*; similarly constructed, with variable pilosity, more accentuate in *Pronomopsis*, scarcer in *Senobasis* and *Pseudorus*.

*Mesonotum*: the mesonotum presents a great diversification within this tribe — in *Cyrtophrys* (Fig. 44) it is moderately convex, with fine and scarce pilosity, the acrosticals are absent, the dorsocentrals present,

becoming longer and stronger post-suturally; the pollinose pattern consists of a central stripe that tapers towards the scutellum, divided by a clearer, longitudinal, incomplete stripe, and of two lateral spots, interrupted at the transverse suture; humeral calli with a few fine hairs, 1 notopleural, 1 supraalar, 1 postalar; scutellum plane, rugose, pubescent and bare of hairs; scutellars absent; post-scutellum only micropubescent on the lateral slopes; in *Deromyia* the mesonotum is moderately convex, with scarce fine hairs; acrosticals absent, dorsocentrals present, becoming longer post-suturally; pollinose pattern: a dark triangular spot, with the apex towards the scutellum, and two spots laterally placed in relation to the first, not interrupted by the transverse suture; the re-



Thorax, lateral view: 44, *Cyrtophrys attenuatus* (Loew); 45, *Senobasis corsair* Bromley; 46, *Megapoda labiata* (Fabricius); 47, *Pseudorus holcocephalinus*, sp. n.; 48, *P. piceus* Walker; 49, *P. hermanni* Carrera.

maintaining parts of the mesonotum with dense golden pollen, darker on the anterior slopes of the mesonotum, especially between the spots; 1 strong and well-developed notopleural; 1 supraalar, 1 postalar; scutellum triangular, plane, pubescent, destitute of bristles; lateral callosities of post-scutellum only micropubescent; in *Lagodias* the mesonotum is not very convex, with hairs restricted to rows of small acrostical and dorsocentral bristles, and some few fine hairs laterally; humeri with fine hairs; 1 notopleural, 1-3 supraalars, 1 postalar; scutellars absent; scutellum thick, pollinose, sometimes with minute bristles laterally; lateral callosities of post-scutellum only micropubescent; mesonotum in *Pegesimallus* similar to *Lagodias*, but pilosity dense, exceptionally long and slender; a wide stripe of acrostical hairs separated by a narrow apilose stripe; dorsocentral pilosity undifferentiated, except post-suturally; humeri with fine hairs; 2 long and moderately strong notopleurals, no supraalar, 2-3 postalars (represented by long erect hairs); scutellum slightly convex, moderately thick, pollinose, with long and fine pilosity; lateral callosities of post-scutellum only micropubescent; in *Senobasis* (Fig. 45) the mesonotum is long and low, the anterior margin high and abrupt; generally fuscous, with two long lateral pollinose spots, separated or not by the transverse suture (Figs. 126-127), bare on the disc, with a group of hairs on the anterior angles and on the humeri, at the lateral margins; dorsocentral rows becoming more numerous and longer in front of the scutellum; acrosticals absent; 1 notopleural, 2-3 supraalars, 2-3 postalars; scutellars absent; scutellum short, rounded, flattened on disc, pollinose, generally apilose; post-scutellum with almost straight wall, lateral callosities bare; sometimes very rare hairs present under the callosities; in *Megapoda* (Fig. 46) the mesonotum is long, somewhat convex, with an abrupt declivity anteriorly and almost plane posteriorly, covered with a very fine pollinosity almost all over the disc, shining at sides; some short, small, erect bristles on the callosities of the anterior declivity of the mesonotum, anteriorly to the transverse suture; acrosticals absent; dorsocentrals reduced to some erect hairs post-suturally, longer in front of the scutellum; 1 well-developed notopleural, 1 shorter supraalar, 2 postalars still shorter; scutellum short, with a rounded margin, dorsally flattened, without marginal bristles, but only with some minute hairs; post-scutellum convex, with the lateral callosities covered by bristly, erect hairs; in *Pronomopsis* the mesonotum is long, slightly convex, pollinose, partially with a weak shine; hairs fine, bristly, sparse, none of them differentiated; lateral bristles weak, consisting of 1 notopleural, 1-2 supraalars still weaker, 8-10 postalars; scutellum short, the disc flattened, with a few sparse hairs; humeri densely pilose; post-scutellum developed, forming an almost straight declivity; lateral callosities of post-scutellum with dense and erect pilosity; in *Pseudorus* (Figs. 47-49) the mesonotum reaches the greatest diversity of forms — it is almost plane, with the anterior portion weakly pronounced, but with an abrupt declivity, thence decreasing towards the scutellum, in *distendens*, *martini*, *rufiventris*, and *bicolor*; in other species it is developed into an anterior gibbosity greatly accentuated, of variable extension, until it comes to cover almost the entire head, as in *hermanni* (Fig. 49), where it reaches its maximum development; Ol-



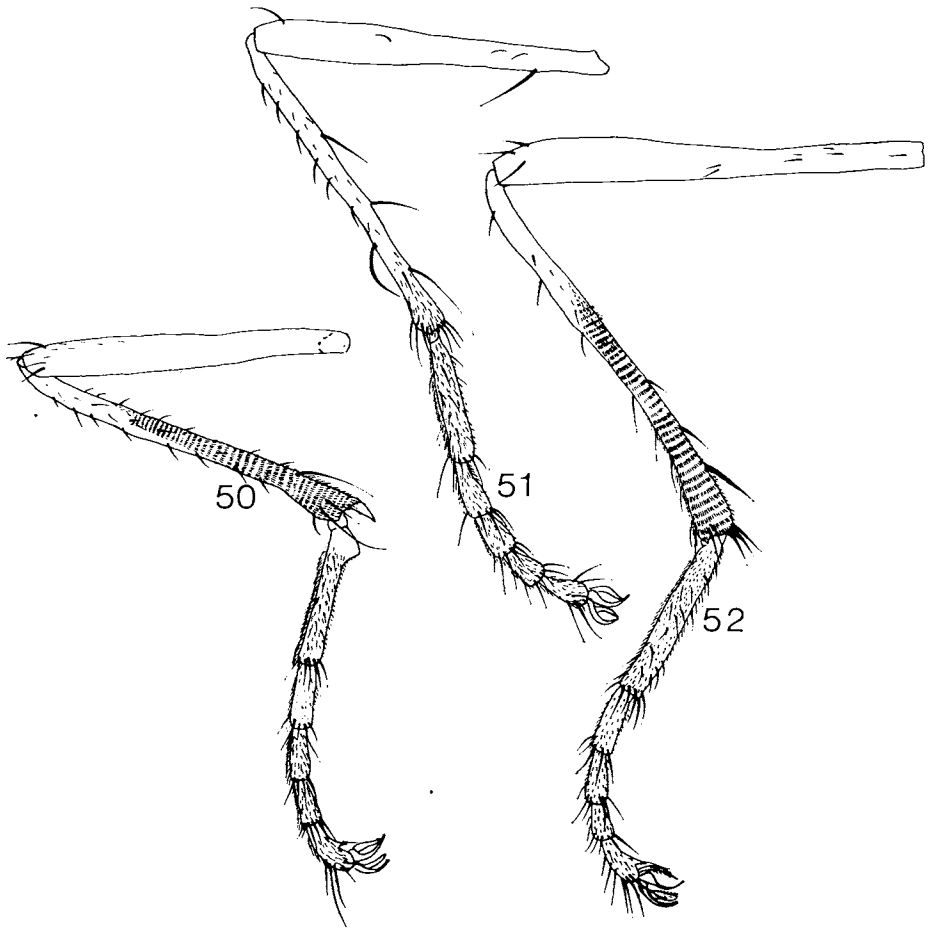
droyd (1964a: 7, fig. 6) gave an excellent illustration of the tendencies in increase of the gibbosity, starting with *distendens*, with a weakly projected mesonotum, through *dimidiatus*, *dandrettiae*, and *piceus*, with increasingly more projected mesonotum, to *hermanni*, where the gibba is maximally developed; the mesonotum in *Pseudorus* can be totally or partially pollinose, micropubescent, or sometimes the pollinosity and the pubescence form a dense covering over the gibbosity, as in *dandrettiae*, *hermanni*, *holcocephalinus*, and *piceus*; in other species (*dimidiatus*, *distendens*, and *martini*) it presents dense pollinose stripes, with 1-3 slender central stripes, and 2 oblong, lateral spots; pilosity is short, more or less abundant anteriorly, dorsally and laterally; the humeri are scarcely pilose or entirely apilose; 1 notopleural, 1 supraalar, 1 postalar; acrosticals absent; dorsocentrals present, but reduced; scutellum reduced, fused anteriorly to mesonotum, bare, shining, sometimes with scarce pilosity; scutellars absent; post-scutellum largely developed, sometimes pollinose; lateral callosities of post-scutellum with hairs.

*Pleura*: in *Cyrtophrys* with scarce and fine hairs; pencil of short and suberect dense hairs on metapleura present; in *Deromyia* the same, hairs being even more scarce; in *Lagodias* pleura with some short and fine hairs; pencil of small bristles on metapleura present or absent (this is the only genus where this characters "fails"); in *Pegesimallus* pilosity denser; *Pronomopsis* densely pilose; in *Senobasis* pleura pollinose, generally apilose, with a few, sparse hairs; metapleural pencil present; in *Pseudorus* pleura bare, shining, with very scarce or no pilosity; metapleural pencil present.

*Post-metacoxal area*: always membraneous in *Cyrtophrys*, *Deromyia*, *Lagodias*, *Pegesimallus*, *Senobasis*, and *Megapoda*; narrowly membranose in *Pronomopsis*; in *Pseudorus* variable — in *distendens* it presents a complete chitinous stripe, behind the coxae; in *bicolor* it has two linear tongues of chitin projecting towards the middle, from each lateral part; in the majority of species it is narrowly sclerotized, immediately beyond the coxae, with a short triangular plate of chitin, followed by a more extense, largely membraneous, area.

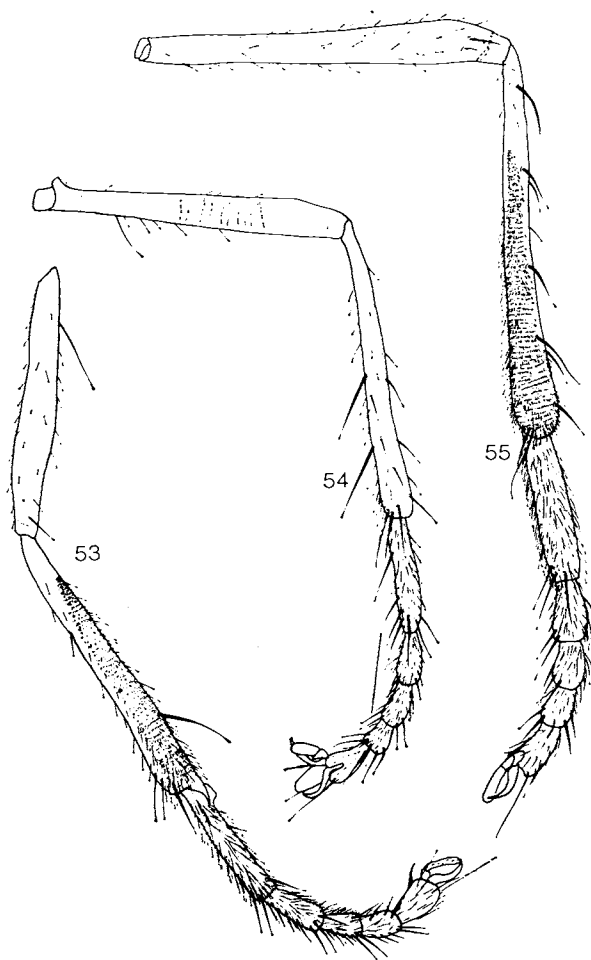
*Legs*: they also show a great diversification — in *Cyrtophrys* (Figs. 50-52) they are moderately long, very slender, the apex of tibiae and femora slightly dilated apically; coxae elongate, pollinose, with short and fine hairs; anterior femur with 2 bristles superiorly, near the apex; anterior tibia with several small lateral bristles, 1 or more long subapical bristles, anteriorly and posteriorly; internal surface of anterior tibiae with several horizontal rows, regularly arranged, of small bristles, starting below the superior 1/3 of the tibia; apex with a strong, curved spine, very long basally; anterior basitarsus with a triangular basal plate; tarsomeres with dense fringe of short erect hairs on the ventrolateral half, substituted by flattened bristles on the opposite half; subapical bristles of tarsi well-developed; middle femur with a long basal and ventral bristle, several short external ones, posteriorly and ventrally, and 2 subapical dorsal bristles; middle tibia with 3 long internal bristles,

1 external and other short, subapical ones; posterior femur as the middle one; posterior tibia without long bristles; internal surface of posterior tibia with the horizontal rows of small bristles starting below the basal  $1/3$ ; claws acute, pulvilli long; in *Deromyia* (Figs. 53-55) legs long and slender, the posterior femur with the posterior  $1/4$  clavate, the posterior tibia incrassate apically; pilosity and bristles generally reduced and similar to *Cyrtophrys*; reduced number of subapical bristles on tibiae and tarsi; same disposition of horizontal rows of small bristles on the anterior tibiae; protibia with a short process and a robust and acute spur apically; anterior basitarsus with elevated basal plate, bearing spinous small bristles; pulvilli and empodia well-developed; in *Lagodias* (Figs. 56-58) legs long and slender, with variable vestiture, from little developed (as shown in Figs. 56-58) to the case of *Lagodias teratodes* Her-



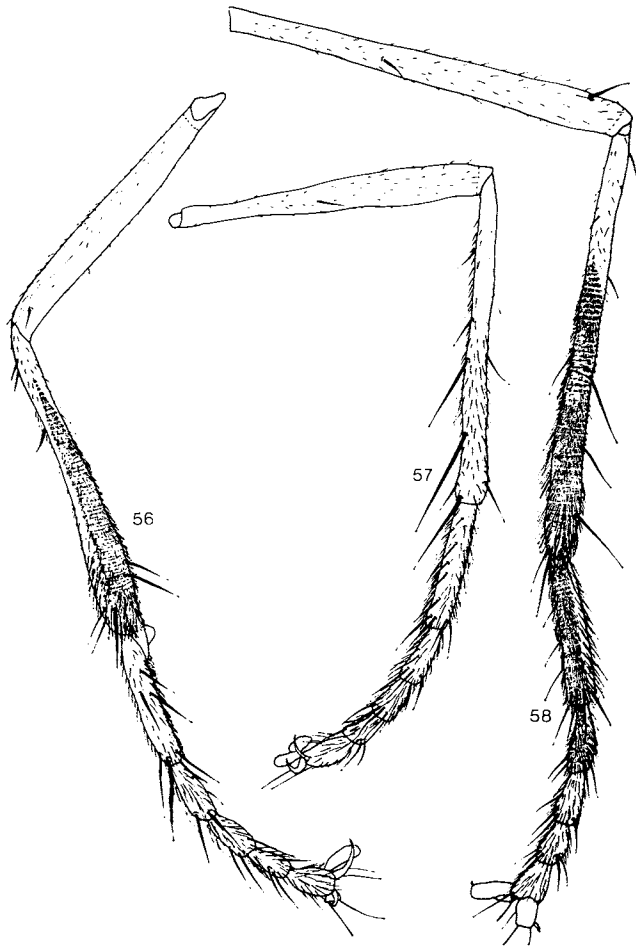
Legs of *Cyrtophrys attenuatus* (Loew): 50, anterior, 51, median; 52, posterior.

mann, with an abundant covering of fringes of large and flattened scales covering the legs on their entirety (see Hull, 1962: 257, fig. 16); anterior and posterior tibiae with horizontal rows of small bristles; protibial spur long and strong; basitarsus with a basal expansion in the shape of a nodular plate; claws acute; pulvilli generally with  $3/4$  of the claws' length; in *Pegesimallus* all femora elongate, the posterior pair slightly dilated towards the apex, all with abundant, long, bristles, dorsally and laterally; these bristles become longer medianly and on the first two pairs of legs longer posteriorly; bristles in general weak, except on the posterior tibiae; apex of protibia with an anteroventral lobe, strongly projected, bearing a curved spur; anterior basitarsus without modifica-



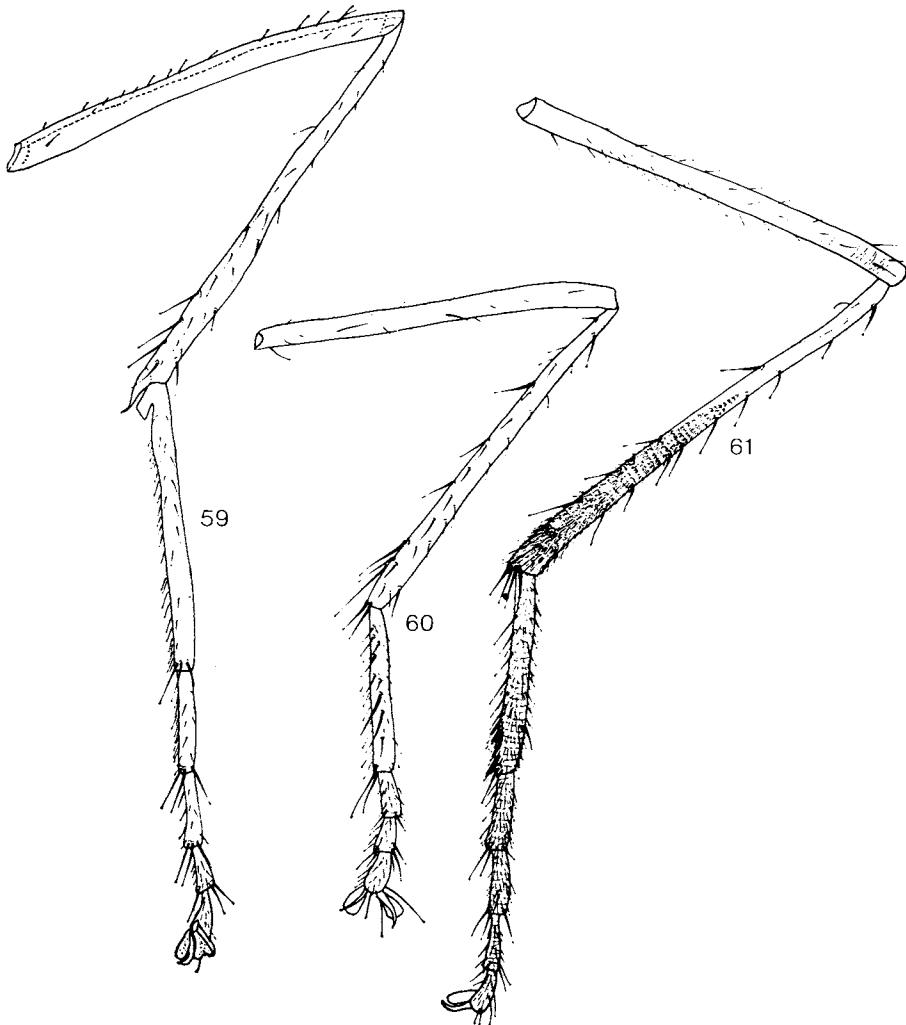
Legs of *Deromyia fuscipennis* (Blanchard): 53, anterior; 54, median; 55, posterior.

tions, comparatively slender, as long as the two following segments together; claws acute, slender, pulvilli spathulate, well-developed; empodium long, thick at base; in *Senobasis* (Figs. 65-67) legs comparatively slender, the posterior femur and tibia elongate, the pilosity reduced to fine and scarce hairs, and bristles reduced but strong; anterior and posterior tibiae with several horizontal rows of small bristles; apex of protibia with long and strong protuberance bearing a short and strong spur; anterior basitarsus with a prominent basal plate; claws comparatively acute, strongly bent at apex, rhombic in *ornata* (Wiedemann); pulvilli large; empodium laminar; in *Megapoda* (Figs. 59-61) legs very long and slender, shining, with reduced vestiture; anterior and middle femora with almost same length, the posterior femora distinctly longer



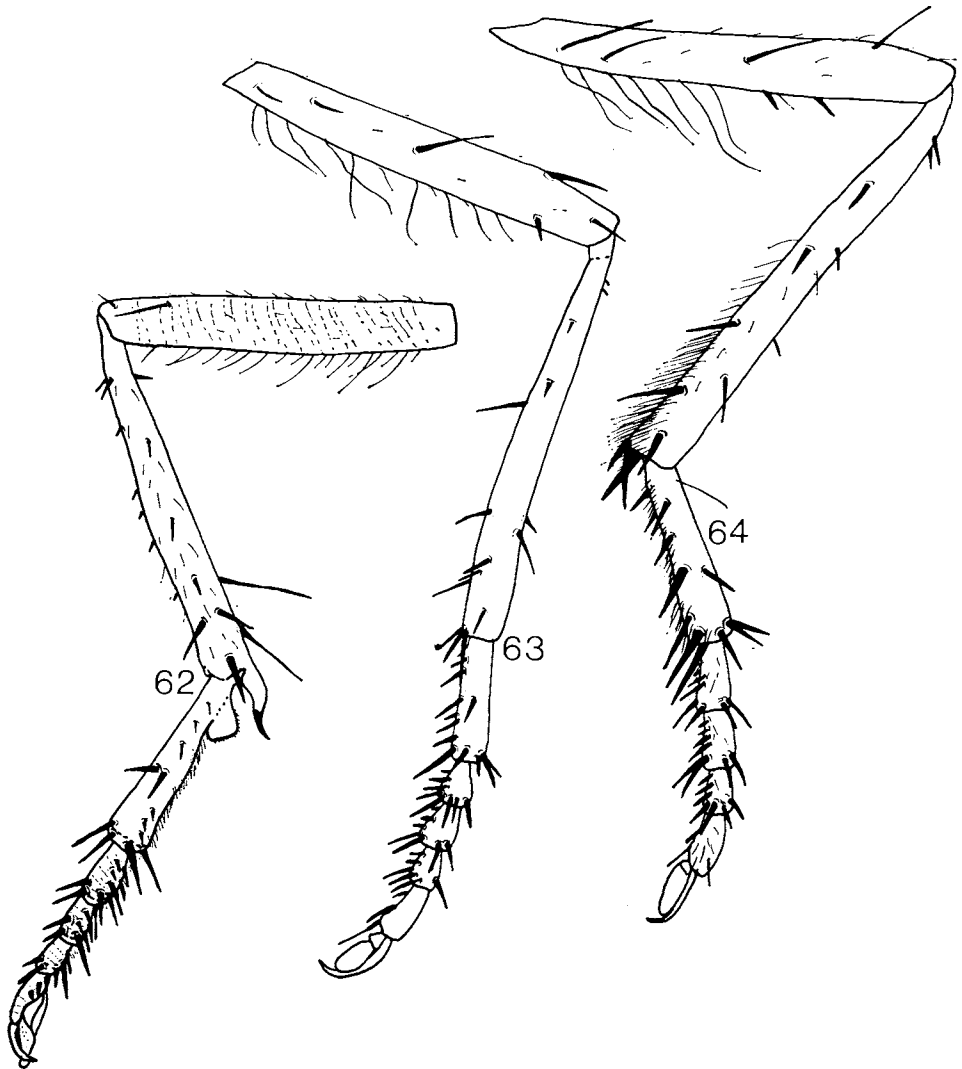
Legs of *Lagodias* sp. (India): 56, anterior; 57, median; 58, posterior.

than the middle one and slightly dilated distally, its tibia incrassate only apically, where it shows a tuft of spinous bristles; femoral bristles few, more noticeable on the dorsoapical surface; tibiae with several strong bristles, especially near the apex, and more so on the middle and posterior tibiae; anterior tibia with a strong, sigmoid apical spur; anterior basitarsus very long, almost as long as the sum of the other 4 segments, with a well developed basal plate; remaining segments of tarsus also very long, with strong bristles; posterior tibia with several horizontal rows of small bristles, beginning beyond the middle of the tibia; ante-



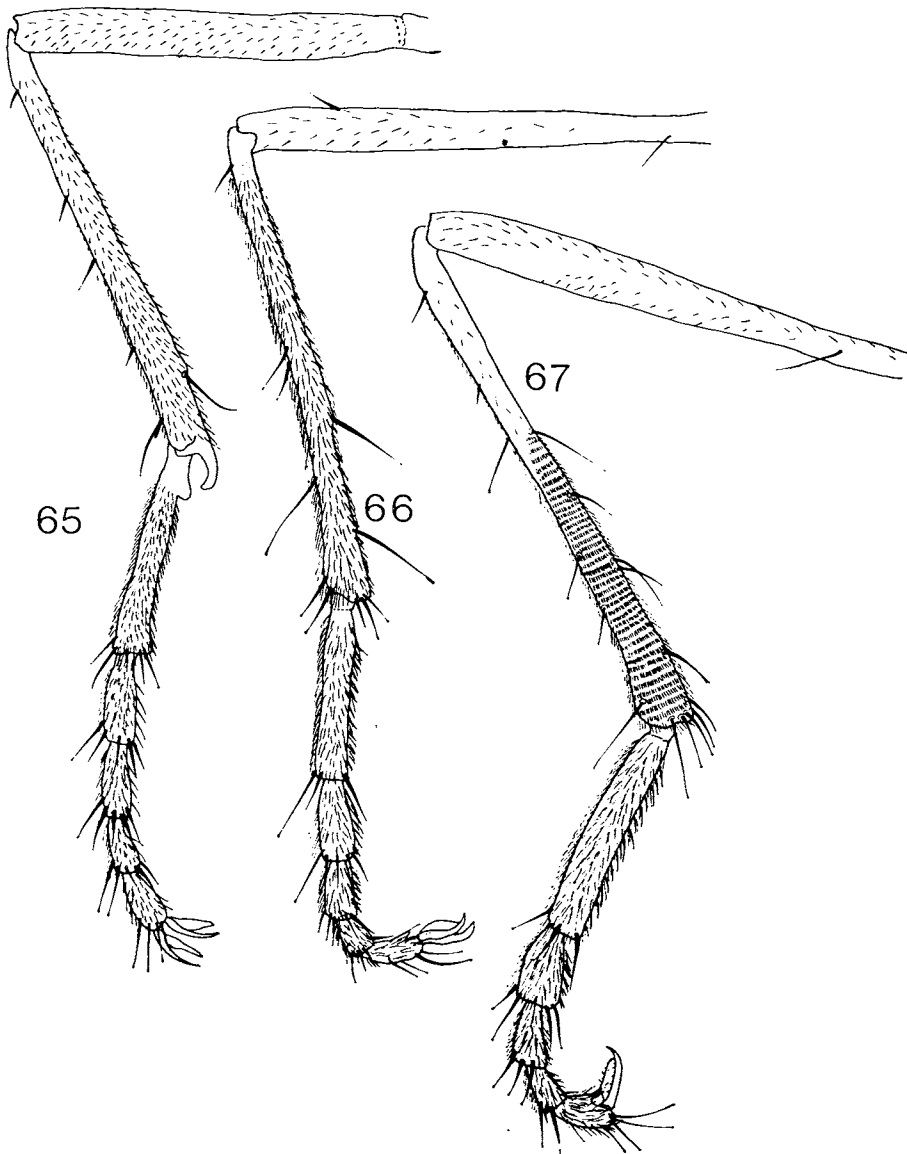
Legs of *Megapoda labiata* (Fabricius): 59, anterior; 60, median; 61, posterior.

rior tibiae also with these rows, beginning at the superior 1/3; posterior tarsi with more developed small bristles, the segments transversally rugose; pulvilli developed, empodium slender, long, slightly flattened, claws more or less short; in *Pronomopsis* (Figs. 62-64) the coxae are long and pilose, the legs are not very long, more or less naked and shining, the femora moderately thick; anterior tibia with a strong apical spur, anterior basitarsus with a pronounced basal plate; posterior femur, tibia and basitarsus more elongate; fine hairs on the femora, ventrally,



Legs of *Pronomopsis rubripes* Hermann: 62, anterior; 63, median; 64, posterior.

longer on the middle and posterior femora; bristles short and thick, spiniform, more noticeable on apex of tibiae and tarsi; anterior and posterior tibiae with the horizontal rows of small bristles on the internal surface; claws acute, pulvilli and empodium well-developed; finally, in *Pseudorus*, as usual, the legs present a great diversity of forms —



Legs of *Senobasis claripennis* (Schiner): 65, anterior; 66, median; 67, posterior.

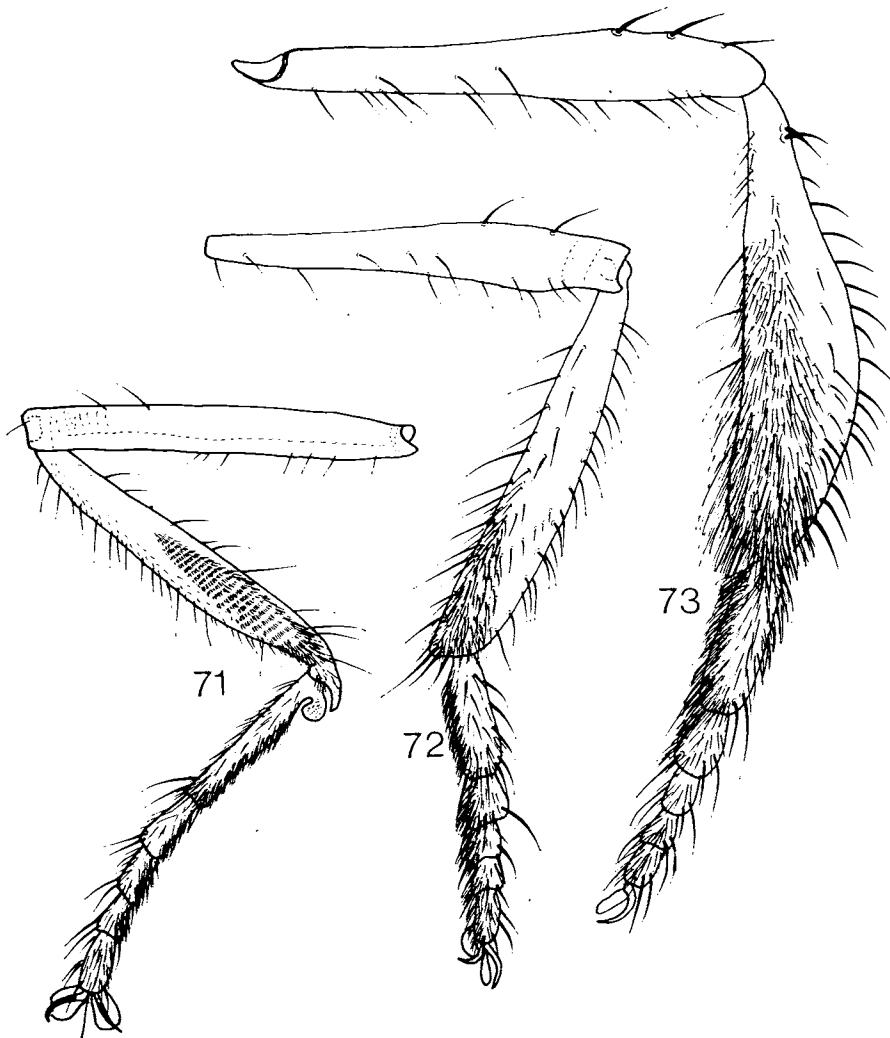
they are long and slender, the femora bare, shining, the tibiae clavate, with strong bristles, especially on the apex, the tarsi densely pilose and with bristles, the anterior basitarsus almost as long as the other 4 segments together, with a prominent basal plate, in *bicolor* Bellardi; in *dandrettae* Carrera (Figs. 68-70) the legs are long and slender, with reduced pilosity, and with slender, but long and strong, bristles, the anterior tibia with some horizontal, sparse rows of compact small bristles, and the tarsi and apex of tibiae with stronger bristles; *holcocephalinus*, sp. n., *martini*, sp. n., and *piceus* Walker have legs very similar to those of *dandrettae*; *rufiventris* (Roeder) has the anterior basitarsus much



Legs of *Pseudorus dandrettae* Carrera: 68, anterior; 69, median; 70, posterior.

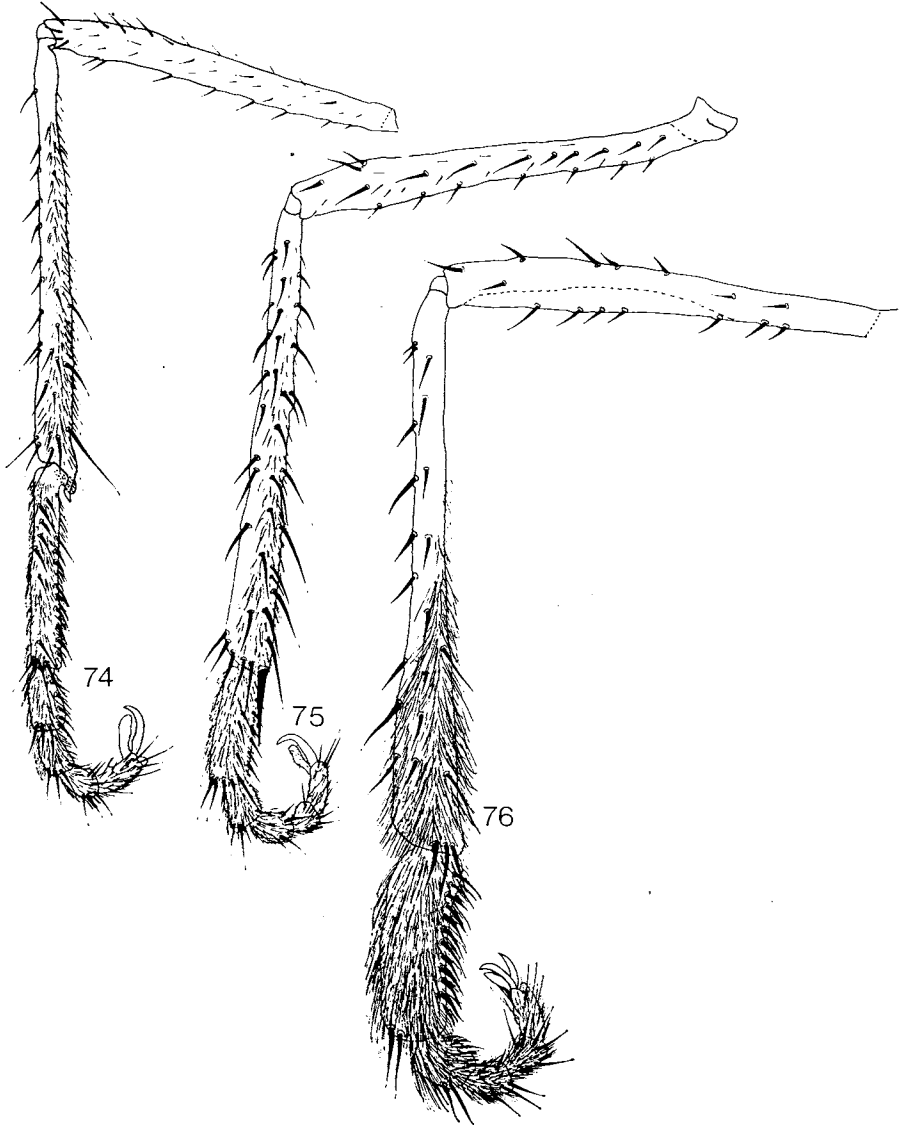


longer than the remaining tarsal segments together; in *hermanni* Carrera the anterior tibia is flattened laterally, enlarged, and the anterior basitarsus is as long as the tibia, subequal in length to the other 4 tarsomeres together, the remaining legs being long and slender, the bristles short, the pilosity in general much reduced; *distendens* (Wiedemann) (Figs. 74-76) presents the apex of the posterior tibiae and the posterior tarsomeres enormously incrassate, with dense and abundant covering of hairs and spinous bristles; *dimidiatus* Oldroyd (Figs. 71-73) is the most differentiated species, as regards the legs: the anterior tibia is not



Legs of *Pseudorus dimidiatus* Oldroyd: 71, anterior; 72, median; 73, posterior.

very long, but is laterally flattened, being wider medianly, with the horizontal rows of small bristles on the internal surface beginning a little above the middle; the anterior basitarsus has  $1/2$  the length of its tibia; the middle tibia is also flattened, with dense pilosity internally and apically; the posterior tibia, equally flattened, is strongly clavate and dilated submedianly, wider than the tarsus, with dense pilosity on the basal  $3/4$  of the internal surface; tarsi strongly pilose, especially on the



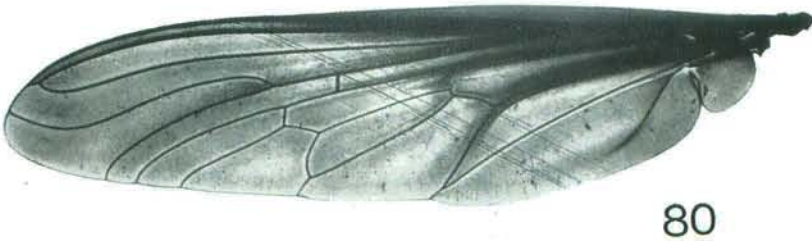
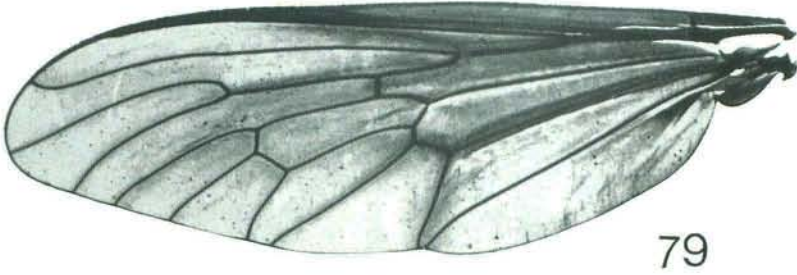
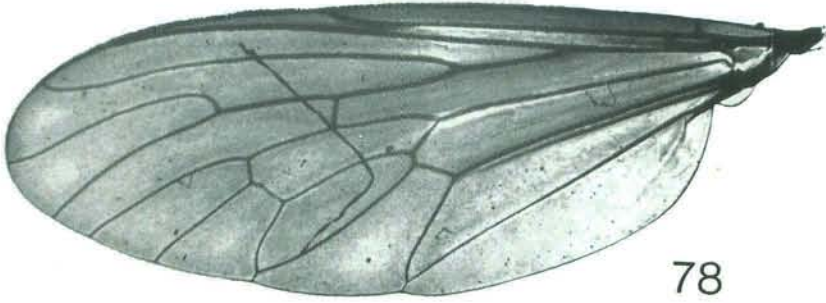
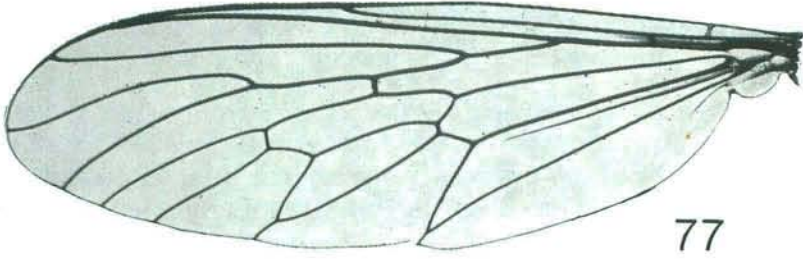
Legs of *Pseudorus distendens* (Wiedemann): 74, anterior; 75, median; 76, posterior.

ventral surface; all the species of *Pseudorus* have horizontal rows of small bristles on the internal surface of the anterior and posterior tibiae, the posterior tibiae tending to reduce these rows, especially when they are dilated and pilose; claws acute, empodium and pulvilli well-developed.

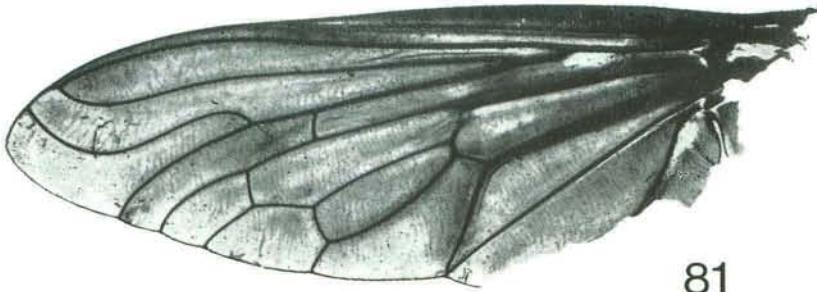
*Wings*: wings are long and slender, or of medium size, or yet wide; hyaline or deeply infuscated with brown, in *Lagodias* (Fig. 79) and *Pegesimallus*; in these two genera the marginal, first and fourth posterior, and the anal, cells are open; in *Pegesimallus* the anal cell is closed at the margin; in *Deromyia* (Fig. 78) wings are large, hyaline (in *nigri-ventris*), or infuscated (in *fuscipennis*), with open marginal cell, but closed and short-petioloated 4th posterior and anal cells; in *Cyrtophrys* (Fig. 77) wings long, not very wide, hyaline, with vitreous reflections, microvillose, with the same venation of *Deromyia*; in *Senobasis* (Figs. 82-85) long and slender, from hyaline (majority of species) to infuscated all over the surface (*corsair* Bromley; Fig. 83), or only at apex (*clavigera* Rondani; Fig. 82); venation as in *Deromyia* and *Cyrtophrys*; in *Megapoda* (Fig. 80) long and very narrow, infuscated with brown, with purplish-blue reflexes, marginal closed with short petiole, first posterior cell open, fourth posterior and anal cells closed and petiolate; in *Pronomopsis* (Fig. 81) wider, brown, with purplish reflexes, and same venation as in *Megapoda*; *Pseudorus* (Figs. 86-92) with several types of wings — long and narrow, moderately wide or very wide, hyaline or infuscated, with colored and hyaline stripes, etc.; marginal cell always closed, except in *hermanni*, where it is open (Fig. 89); *hermanni* and *piceus* (Fig. 92) present 3 submarginal cells; all other known species have only 2 submarginal cells; first posterior cell open in all species, except *dimidiatus* Oldroyd, where it is closed and petiolate; fourth posterior and anal cells always closed.

#### 4.3. ABDOMEN

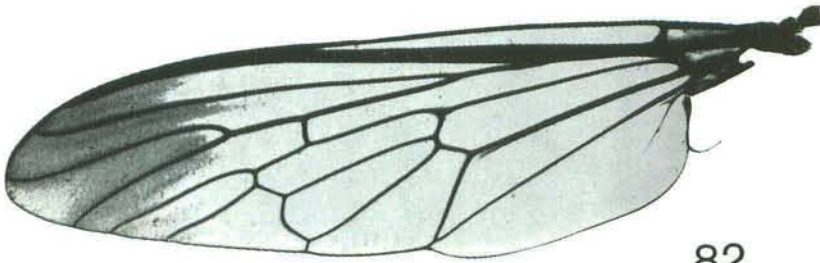
Abdomen long and slender, subcylindrical, slightly clavate posteriorly, almost as long as wings, in *Lagodias*, with tergite 1 sometimes thicker and convex laterally, sometimes tergite 2 concave dorsally, with a median basal "bulla", and sometimes also tergite 3 slightly concave basally; pilosity variable; male with 7 or 8 tergites, 8th reduced to small lateral piece, on the left side; female with 8 tergites. In *Pegesimallus* abdomen subclavate, distally narrower than mesonotum, convex on tergites, tergites 2 and 3 especially convex or arcuate in lateral view, tergite 2 with an additional sub-basal arch and distinctly longer than the remaining; pilosity short, but abundant and compact dorsally, becoming slightly longer laterally and especially fine at sides of tergites 1 and 2; bristles absent on all tergites; tergite 1 apilose, 2 and 3 with groups of long fine hairs, similar to those of metasternum; males with 7 ter-



Wings: 77, *Cyrtophrys attenuatus* (Loew); 78, *Deromyia fuscipennis* (Blanchard); 79, *Lagodias* sp. (India); 80, *Megapoda labiata* (Fabricius).



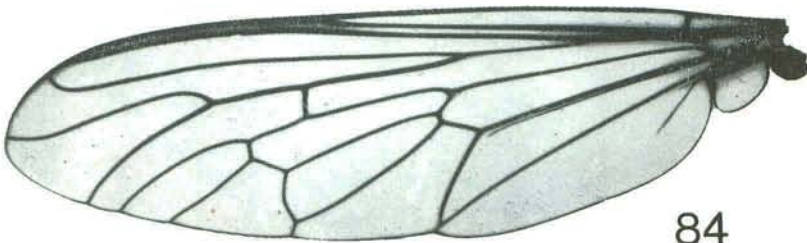
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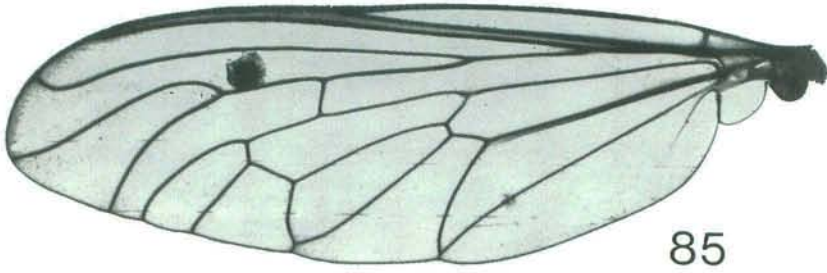


83



84

Wings: 81, *Pronomopsis rubripes* Hermann; 82, *Senobasis clavigeroides*, sp. n.; 83, *S. corsair* Bromley; 84, *S. gyrophora* (Schiner).



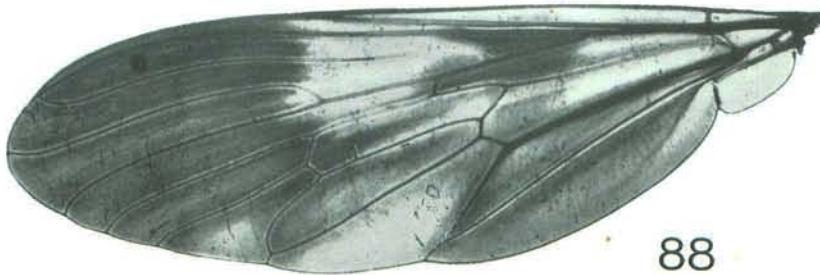
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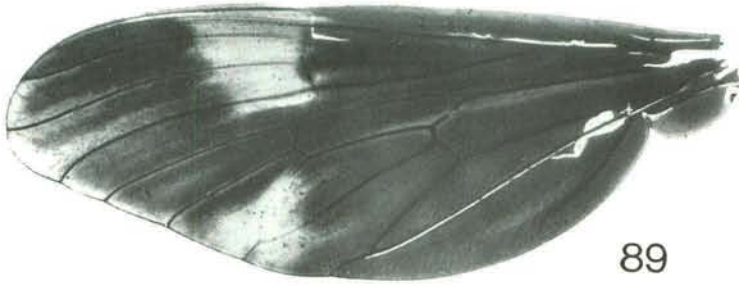
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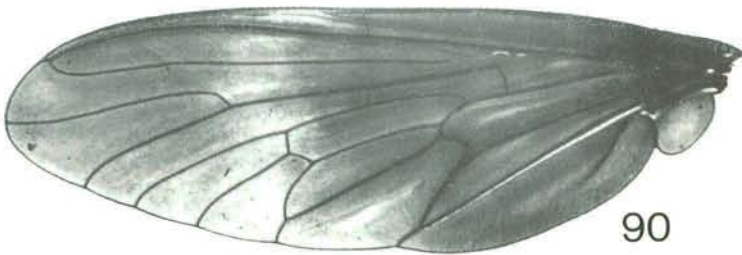
88

Wings: 85, *Senobasis apicalis* (Schiner); 86, *Pseudorus bicolor* Bellardi; 87, *P. distendens* (Wiedemann); 88, *P. dandrettae* Carrera.

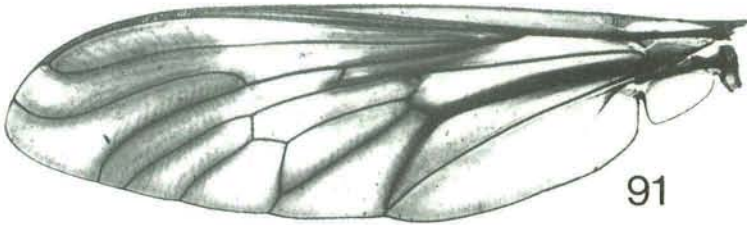




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92

Wings: 89, *Pseudorus hermanni* Carrera; 90, *P. holcocephalinus*, sp. n.; 91, *P. martini*, sp. n.; 92, *P. piceus* Walker.

gites, the 6th  $\frac{2}{3}$  the length of the 5th, the 7th smaller than  $\frac{1}{2}$  the length of the 6th. In *Deromyia* abdomen elongate, slender, almost cylindrical, narrower on the posterior end of tergite 2, becoming gradually wider towards the apex; the first 2 or 3 tergites in profile with a "bulla" posteriorly and depressed anteriorly; pilosity reduced to small bristles, short and sparse, more numerous on the apical tergites and sternites, where they are also longer; tergite 1 with or without 2 strong bristles laterally; males with 8 tergites, 8th normally very short and concealed; females with 8 tergites, the last large. In *Cyrtophrys* abdomen elongate, subclavate, almost as long as the wing, the first 2 or 3 tergites in profile also bullose latero-posteriorly and depressed anteriorly; pilosity scanty, fine and erect; abdomen generally bare and shining; sides of tergite 1 with 1-2 bristles; males with 7 tergites, females with 8. In *Senobasis* abdomen elongate, but as wide as mesonotum, slightly clavate in males, due to a large and prominent genitalia, frequently pollinose, sometimes partially without pollen, or totally without pollen and shining (*lopesi* Carrera), dorsal pile consisting in scarce, fine, small bristles, lateral pilosity long and fine, tergite 1 usually with 3 strong bristles; males with 7, females with 8 tergites. *Megapoda* with abdomen showing tergite 1 and base of 2 almost as wide as mesonotum, becoming parallel-sided or almost divergent in males, black with purplish reflexes, tergite 2 distinctly longer than tergite 3, remaining tergites progressively shorter; pilosity abundant, compact, and bristle-like, with some long, fine hairs laterally on tergite 1 and some longer, small bristles on posterior sides of tergite 2; basal half of tergite 2 bare; males with 7 tergites, 7th with  $\frac{4}{5}$  length of 6th, and under it, the margin of the 8th can be seen; females with 7 tergites, the 8th and following forming the ovipositor. *Pronomopsis* has the abdomen compressed dorsoventrally, almost as wide as the mesonotum at base, tapering towards the apex, with dense, compact, and bristly hairs, longer and erect on sides of first two tergites; males with 7 tergites, 8th concealed; females with 7 tergites, 8th incorporated into the ovipositor. Finally, *Pseudorus* presents the usual variation — in a number of species the abdomen is slightly wider at the end of tergite 3 (wider than at base) and at that point distinctly wider than the mesonotum, being strongly constricted beyond tergite 3; pilosity scarce, fine, suberect, short; sides of tergite 1 with a few bristly hairs; male and female with 7 tergites, the 8th in the female incorporated into the ovipositor; in *bicolor* Bellardi the abdomen is robust, as wide as the mesonotum and wider on tergites 3 and 5, the pilosity short, scanty, erect and cerdiform, bristles absent; in *distendens* (Wiedemann) the abdomen is short, considerably shorter than the wings, almost as wide as the mesonotum at the base, with prominent transverse striae and scanty pilosity, with fine and erect hairs, a little more abundant posteriorly on all segments, some small bristles or thicker hairs on the last 2 segments, but bristles always absent; posterior half of tergite 2 and sub-basal portion of 3 each with a transverse, ovoid pit, sublaterally, which may serve for muscular insertion, according to Hull (1962: 426); males with 7 tergites, the 7th very short, females with 7 tergites, but the last 2 short and of the same length.



## 4.4. MALE GENITALIA

In *Lagodias* (Figs. 105-107) as well as in *Pegesimallus* the male genitalia is very conspicuous, not rotated in the latter genus, and rotated from 180° to 360° in the former; epandrium with the two halves completely fused, well-developed, and entirely fused to the hypandrium, through a wide and well-developed bridge, the 8th segment thus forming a complete ring; hypandrium relatively short, but very robust and developed, mammiform; basistyli and dististyli wide at base and digitiform at apex; cerci fused, long and wide, forming a kind of sleeve or collar, accompanied by the anal lamellae, also very long; aedeagus conical, elongate, without lateral projections in the species examined.

*Cyrtophrys* (Figs. 93-101) and *Deromyia* (Figs. 102-104) have similar male genitalia; the former presents a rotation of 180°, the latter also has a strongly rotated genitalia; the cerci are fused, at least through most of their extension; epandrium with the two halves completely fused, forming a piece of noticeable dimension, and fused to the hypandrium, through a very narrow bridge; hypandrium wide basally, long, tapering rapidly; basistyli with a small apical digitiform process; dististyli placed medianly on the basistyli, wide basally, digitiform distally, frequently with the apical part directed towards the interior of the genitalia; aedeagus conical, elongate, without lateral projections; anal lamellae well-developed, forming with the cerci a large and conspicuous sleeve or collar, especially visible in lateral view; these two genera present a very narrow bridge between the hypandrium and the epandrium, differing in that aspect from the Old World genera (cf. Figs. 95, 98, 101 and 104).

*Senobasis* presents a great variation in the morphology of the genitalia (Figs. 128-172), but can be described in general terms as entirely rotate, the epandrium forming a sole plate, conspicuous, with apical digitiform expansions of variable length, the epandrium fused to the hypandrium; the latter generally well-developed, more or less short, or elongate, tongue-like, between the gonopods, with a rounded apex; gonopods bulging, widened basally, apically with a variable, more or less curved digitiform process, which may be absent, or assume different proportions; aedeagus variable; cerci fused, moderately long. According to the male genitalia, the species of *Senobasis* may be grossly separated in several groups:

1. *gyrophora*-group: hypandrium short, not projected between gonopods in the shape of a tongue; apical processes of basistylus relatively short and undeveloped: *gyrophora* (Schiner) (Figs. 155-157), *notata* (Bigot) (Figs. 170-172), *lanei* Carrera (Figs. 158-160), and *mundata* (Wiedemann) (Figs. 164-166);

2. *claripennis*-group: hypandrium either short, or tongue-like and produced between gonopods; apical process of basistylus relatively short, the gonopod, as seen in lateral view, broadly oval: *apicalis* (Schiner) (Figs. 140-142) and *claripennis* (Schiner) (Figs. 143-145);

3.  *analis*-group: hypandrium tongue-like, produced between gonopods; apical process of basistylus long and slender:  *analis* Macquart (Figs. 131-133),  *ornata* (Wiedemann) (Figs. 167-169),  *corsair* (Bromley) (Figs. 149-151),  *mendax* Curran (Figs. 161-163),  *bromleyana* Carrera (Figs. 134-136), and  *lenkoi*, sp. n. (Figs. 137-139); in the last species the apical process of the basistylus is absent; however, this species was placed here because it is clearly related to  *bromleyana* Carrera;

4.  *clavigera*-group: hypandrium produced between gonopods, tongue-like; apical process of basistylus long, large, spatulate at apex, as seen in lateral view:  *aedon* (Walker) (Figs. 128-130),  *clavigeroides*, sp. n. (Figs. 146-148),  *flukei* Carrera (Figs. 152-154).

In  *Megapoda* (Figs. 108-110) the genitalia is large, rotated of 180°; epandrium sub-rectangular, with the two halves completely fused, the sides curved; epandrium fused to hypandrium; the former very short, in profile not reaching tip of gonopods; in dorsal view (Fig. 109) wide, short, with a pronounced median concavity; cerci not as developed as in  *Cyrtophrys* and  *Deromyia*, but also fused, accompanied by the anal lamellae, also regularly developed; basistyli well-developed, strong, very wide as seen in lateral view, largely open, leaving a great concavity in the interior of the genitalia; dististyli wide and short at base, elongate, slender, curved towards the interior of the genitalia apically, and medianly placed on the basistyli (see Carrera, 1952: 63, figs. 17, 18, 19, 20); aedeagus wide basally, tapering towards the apex, curved towards the interior of the genitalia, with a pronounced apical cleft, which does not divide, however, the apex in two independent halves; lateral and apically the aedeagus is covered by minute spines.

*Pronomopsis* (Figs. 111-113) has a genitalia rotated of 180°, very similar to that of  *Megapoda*, with the same general type of structure, but here epandrium is trapezoidal, the cerci show characteristic lateral processes; the hypandrium is identical; the basistyli show apical internal and external processes; the dististyli are strongly conical and of the same type of  *Megapoda*; aedeagus without apical cleft, but with a kind of "glans" very well-developed, with lateral spines.

*Pseudorus* (Figs. 114-125) has a genitalia similar to  *Pronomopsis*, but the hypandrium is more deeply recessive, the epandrium more trapezoidal, and the dististylus developed, long, with the apical half characteristically falciform; the other structures as in  *Megapoda* and  *Pronomopsis*; the aedeagus is more or less voluminous and bulbous basally, varying in length among the different species, and apically with a relatively short cone, laterally set with minute spines; the basic essential characteristic in the male genitalia of  *Pseudorus* is the basal coalescence of the two gonopods through a chitinous bridge less sclerotized than the gonopods proper; this bridge is also fused to the aedeagus and or to the aedeagal processes.

## 4.5. FEMALE TERMINALIA

According to the different patterns of female terminalia, the Megapodini genera may be grouped as follows:

A. Terminalia with acanthophorites, i.e., tergite 9 has lateral groups of spines, and ventrally with or without a process in the form of cerci or pincers — *Cyrtophrys* (see Hull, 1962: 766, fig. 1893), *Lagodias* (see Hull, 1962: 771, fig. 1991), *Pegesimallus*, and *Deromyia*.

B. Terminalia consisting of a plate, more or less triangular, without spines:

1. Plate short and wide, slightly rounded, with a median cleft, formed by *tergite 9*; 8th tergite compressed by the 7th, but prominent; 8th sternite large, flattened, largely depressed in the median portion; 7th sternite with several long and strong, downward directed bristles (see Hull, 1962: 782, fig. 2131);

2. Plate variable, but always formed by *tergite 8*: in *Megapoda* (see Hull, 1962: 782, fig. 2139) short and cylindrical, slightly higher than wide, the 9th and especially the 10th tergites very short; 8th tergite seeming to be separated from the 8th sternite, the same apparently occurring with segment 9; in *Pronomopsis* (see Hull, 1962: 783, fig. 2144) large, triangular, slightly convex, segments 9 and 10 shorter and smaller than the 8th, the 10th with lateral lobes; segment 8 forming a large triangular body, dorsoventrally flattened, with the ventral and dorsal surfaces slightly convex; *Pseudorus* (see Hull, 1962: 784, figs. 2168, 2169) has an elongate, posteriorly attenuate plate, enlarged and thickened at the base, dorsoventrally compressed, sometimes convex or upturned, with segments 9 and 10 situated apically and very reduced.

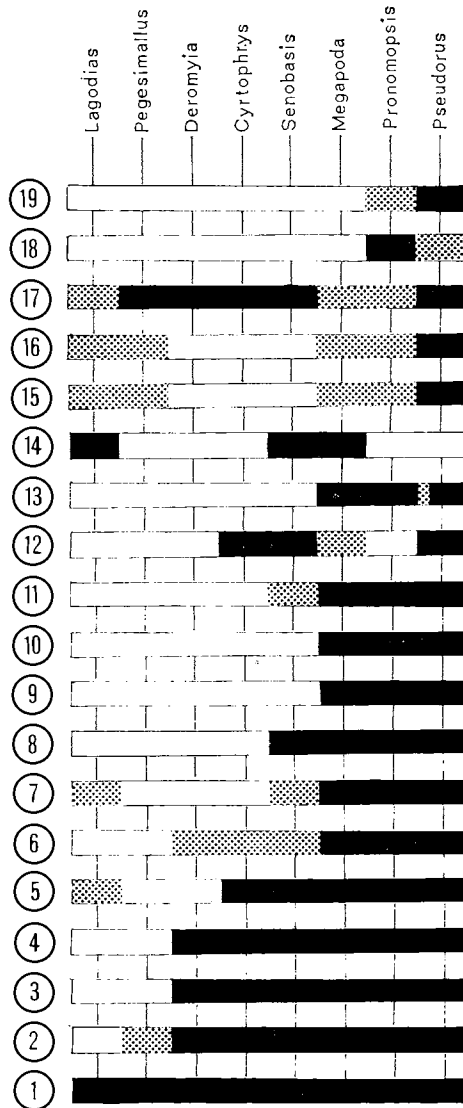
## 5. SYSTEMATICS

Carrera (1949) erected the tribe Megapodini for the genera with a one-segmented palpus and the male genitalia with the 9th segment completely fused, forming a ring. Hull (1962) gave subfamily rank to the group, on the premise that all its genera had the ovipositor "formed by a broad, triangular, platelike, convex, eighth tergite and an incompletely divided ninth tergite without any spines."

Carrera (op. cit.) had not dissected *Cyrtophrys* and *Deromyia*, which have the Megapodini type of male genitalia, but two-segmented palpi; Hull forgot to mention that the ovipositor of *Senobasis* is analogous to that of *Megapoda*, *Pronomopsis* and *Pseudorus*, but the plate is formed at expenses of *tergite 9*, whereas in the other 3 genera the plate is formed by *tergite 8*; moreover, the genera *Cyrtophrys*, *Deromyia*, *Lagodias*, and *Pegesimallus* have spinous acanthophorites in the female terminalia, and not the plate-like ovipositor of Hull's Megapodini.

Thus, the Megapodini show many intermediate and overlapping characters with the other Dasyopogoninae, and the group cannot be

considered as a separate subfamily. However, there is no diagnostic character common to all these genera, except for the male genitalia (see Tables 1 and 2, character n.º 1). There are then the questions:



1

Table 1. Comparison of Megapodini characters (in white: character in primitive condition; in black: character in derived condition; in stippled: intermediary character, or both conditions of a same character present in same genus). Legends in Table 2.

Table 2. Comparison of characters of the Megopodini genera

	<i>Pegastmatius</i>	<i>Zagodius</i>	<i>Cyrtophya</i>	<i>Deromyia</i>	<i>Senobasis</i>	<i>Megapoda</i>	<i>Pronomopsis</i>	<i>Pseudorus</i>
1. Epandrium fused to hypandrium	present	present	present	present	present	present	present	present
2. Anal cell	closed	open	closed	closed	closed	closed	closed	closed
3. Fourth posterior cell	open	open	closed	closed	closed	closed	closed	closed
4. Acrosticals	present	present	absent	absent	absent*	absent	absent	absent
5. No of tergites, ♂	7	7-8	7	8	7	7	7	7
6. Shape of hypandrium	mammiform	mammiform	tongue	tongue	triangle or tongue	concave	concave	concave
7. No of palpal segments	2	1-2	2	2	1-2	1	1	1
8. Bullae of tergites	present	present	present	present	absent	absent	absent	absent
9. No of tergites, ♀	8	8	8	8	8	7	7	7
10. Female terminalia formed by segment	9	9	9	9	9	8	8	8
11. Post-scutellar callosities	bare	bare	bare	bare	bare	pilose	pilose	pilose
12. Antennal style	present	present	absent	present	absent	present	present	present
13. Marginal cell	open	open	open	open	open	closed	closed	open/closed
14. Width of face (in relation to width of head)	2/5	1/3	1/3	1/3	1/5	1/4	1/3	1/3
15. Shape of face in profile	prominent	prominent	plane	plane	plane	prominent	prominent	concave
16. Lateral bristles on tergite I	present	present	present	present/absent	present	reduced	reduced	reduced/absent
17. Pilosity of scutellum	developed	reduced	absent	absent	absent	reduced	reduced	absent
18. Dorsocentrals	present	present	present	present	present	present	reduced	reduced
19. Post-metacoxal area	membrane	membrane	membrane	membrane	membrane	membrane	narrowly membranous	partially sclerotized

1. Is the condition of the male genitalia (i.e., the fusion of the epandrium and hypandrium forming a complete ring) mono- or polyphyletic?

2. Which rank should one give to this assemblage of genera?

As to the first question, I think it very difficult to accept that the derived condition of the male genitalia has appeared two or more times independently, by parallel or convergent evolution. If that was true, the other morphological characters should also have undergone a too great series of parallel or convergent evolution to explain the similarities among the genera. I believe that this condition is monophyletic — once this first premise is accepted, then the other external characters compose a very logical picture, and the phylogeny and zoogeography of the group can be reasonably well interpreted.

If it is then accepted that this is a monophyletic group, then it represents a different branch from the other Dasypogoninae, and should merit the same rank. This solution was adopted before (1973), in my key to the tribes of Dasypogoninae. I am well aware of the fact that there is no character to separate them from the other Dasypogonini, the male genitalia excepted. It is then difficult to key them out; but I prefer to use classification to reflect phylogenetic tendencies and not taxonomic keys.

Within the Megapodini several evolutionary tendencies can be discerned; I'm calling these groups of genera "subtribes"; these can be identified by the following key.

#### 5.1. KEY TO SUBTRIBES

1. Marginal cell open; post-scutellar callosities without hairs, only micropubescent; or, if with hairs, these are located *under* the callosities; females with 8 tergites; female terminalia formed by segment 9; males with hypandrium short and mammiform, or prolonged between the gonopods, tongue-like ..... 2
  - Marginal cell closed (if open then face strongly concave medianly, projected in the form of a thick lip inferiorly); post-scutellar callosities with erect hairs; females with 7 tergites; female terminalia formed by segment 8; males with hypandrium short and wide, strongly concave medianly ..... Subtribe Megapodina Carrera
2. Fourth posterior cell open; anal cell open or closed, or closed at the margin; acrosticals present; hypandrium short, robust, mammiform (Old World) ..... Subtribe Lagodiina, new
  - Fourth posterior and anal cells closed and petiolate; acrosticals absent; hypandrium tongue-like, prolonged between gonopods ..... 3

3. Antennal style present or absent; in the latter case, a minute spine dorsally placed on the 3rd segment, medianly, or subapically; posterior margin of tergite 1 with "bullae"; face 1/3 of head's width; female terminalia with spinous acanthophorites (Chile, Guiano-Brazilian subregion) . . . . . Subtribe *Cyrtophryina*, new

Antennal style always absent, only a minute spine on the 3rd antennal segment, apically placed; posterior margin of tergite 1 without "bullae"; face 1/3 of head's width; female terminalia a triangular plate, never with spines (Guiano-Brazilian subregion) . . . . . Subtribe *Senobasiina*, new

#### 5.2. SUBTRIBE CYRTOPHRYINA, NEW

Marginal cell open; post-scutellar slopes without hairs, only micro-pubescent; 4th posterior and anal cells closed and petiolate; acrosticals absent; females with 8 tergites, terminalia formed by segment 9, with spinous acanthophorites; male hypandrium elongate, tongue-like, produced between gonopods; antennal style present or absent, in the latter case a spine subapically or medianly implanted on the dorsal surface of the 3rd antennal segment; posterior margins of the first abdominal tergites with "bullae"; face 1/3 total width of head.

Type-genus, *Cyrtophrys* Loew.

The *Cyrtophryina* differ from the *Lagodiina* in the closed 4th posterior cell and in the lack of acrosticals, as well as by the different structure of the male genitalia; from the *Senobasiina* by the different width of the face, the presence of "bullae" on the first abdominal segments and by the spined female terminalia.

#### Key to genera

1. Antennal style present (Chile) . . . . . *Deromyia* Philippi  
 Antennal style absent; only a subapical or median spine on dorsal surface of 3rd antennal segment (Guiano-Brazilian region) . . . . . *Cyrtophrys* Loew

#### Genus *Cyrtophrys* Loew

*Dasypogon*, subg. *Cyrtophrys* Loew, 1851: 3. Type-species, *attenuatus* Loew (mon.).

*Cyrtophrys*; Williston, 1891: 74; Carrera, 1949: 121; Hull, 1962: 250, figs. 180 (antenna), 552 (wing; in error, the wing represented does not belong to *Cyrtophrys*), 566 (wing), 1091, 1100 (head), 1893 (female terminalia); Martin & Papavero, 1970: 30 (cat.).

*Myolestes* Brèthes, 1904: 338. Type-species, *lynchii* Brèthes (mon.).  
 N. SYN.

*Myiolestes* Kertész, 1909: 123, emend.

*Mirolestes* Curran, 1935: 1 (unjustified nom. nov. for *Myiolestes* Brèthes, on the assumption that it was preocc. by Cabanis, 1851; actually only Kertész' emendation *Myiolestes* is preocc., by Bonaparte, 1850). Type-species, *Myiolestes lynchii* Brèthes (aut.). Refs. — Carrera, 1949: 111-118 (key to spp., descriptions); Hull, 1962: 251, figs. 71 (antenna), 530 (wing), 1092 (head), 1101 (head), 1821 (male genitalia), 1892 (male genitalia); Martin & Papavero, 1970: 31. N. SYN.

Face  $1/3$  total width of head, almost plane in lateral view, slightly prominent at oral margin; 3rd antennal segment long, slender, apical style absent, only a subapical or median spine dorsally placed on 3rd antennal segment; mesonotum slightly convex, almost plane; marginal cell open, 4th posterior and anal cells closed and petiolate; post-scutellar callosities only micropubescent; scutellum without bristles; acrosticals absent; males with 7 tergites, females with 8; first abdominal tergites with "bullae"; female terminalia formed by segment 9, with spinous acanthophorites; male hypandrium prolonged, tongue-like, between gonopods; vestiture in general very reduced; cervicalia very long.

Taxonomic discussion: *Cyrtophrys* was proposed by Loew in 1851, as a subgenus of *Dasygogon*, monobasic for *attenuatus* Loew. This subgenus was published in the "Program der königlichen Realschule zu Meseritz" (p. 3). The female type had been collected in Brazil. According to Papavero (1971b), the probable type-locality for this species is Nova Friburgo, State of Rio de Janeiro, where C. H. Bescke collected for many years. Specimens from the MZUSP collection coming from that area agree perfectly well with the original description of *attenuatus*, which seems to be a common species in Nova Friburgo.

Describing the type Loew declared that the "3te Glied [was] etwas länger als die beiden ersten Glieder zusammen, auf der Oberseite behaart; der Fühlergriffel dick, wenig kürzer als das 3te Fühlerglied, dem der *Dioctria*-Arten in seinem Baue sehr ähnlich." Loew has probably examined superficially the 3rd antennal segment — the spine being placed medianly on the dorsal surface of the 3rd antennal segment, in a recession, Loew must have judged it as the basal part of the style (Fühlergriffel). This fact misled subsequent authors, which were not able to identify this genus.

Also in 1851 Walker described a female specimen as *Dioctria tenuis*. I have examined the type at the BMNH and there is no doubt that it is the same as *attenuatus* Loew. I propose therefore that *attenuatus* be maintained as the valid name, for the following reasons:

- i) it is the type-species of *Cyrtophrys*;
- ii) it is known that the "Program" distributed by Loew for the parents of students and friends of the Royal School of Meseritz must have been forwarded before 29 September 1851 (Michaelis, 1851), while Walker's publication, also from 1851, cannot be precisely dated.



Brèthes (1904) erected *Myolestes*, for a new species (*lynchii*) from Argentina. Kertész (1909) emendated the name to *Myiolestes*. Curran (1935) proposed a new name for *Myiolestes* (preoccupied by Bonaparte, 1850, and Cabanis, 1851), attributing the name to Brèthes, in error. This mistake was followed by Carrera (1949), Hull (1962), and Martin & Papavero (1970). See Arnaud (1974) for further comments.

Carrera (1949) had already noticed the similarities between the nominal genera *Cyrtophrys* and *Mirolestes*, but maintained them separate because of the antenna, which was believed to carry a very long style. Hull (1962) did the same.

Considering that the difference in the implantation of the spine on the dorsal surface of the 3rd antennal segment is only of specific value, I propose the synonymy of *Myolestes* (and *Mirolestes*) with *Cyrtophrys*.

Key to species (modified from Carrera, 1949: 113)

1. 3rd antennal segment twice the length of the basal two together, with the dorsal spine implanted near the middle of its length; male mesonotum with silvery pollinosity on anterior half; in females mesonotum with yellow pollinosity (Brazil: Minas Gerais, Rio de Janeiro, São Paulo) ..... *attenuatus* (Loew)
  - 3rd antennal segment never twice as long as basal two segments; dorsal spine implanted always beyond the middle of 3rd antennal segment; median longitudinal stripe of mesonotum divided at least in all its anterior half ..... 2
2. Antennae dark-brown; apical half of 3rd antennal segment, or the entire segment, black; dorsal spine situated on apical 2/3 of 3rd segment ..... 3
  - Antennae completely reddish-yellow; spine located on apical 5/6 of 3rd segment; (Brazil: Mato Grosso to São Paulo, south to Tucumán, in Argentina) ..... *lynchii* (Brèthes)
3. Tarsi of fore legs completely white, except apical segment, which is dark; mesonotal pollinosity whitish (Brazil: Rio de Janeiro and Guanabara) ..... *albimanus* Carrera
  - Tarsi of fore legs reddish-yellow, apex of segments darker; mesonotal pollinosity golden or brown (Brazil: Rio de Janeiro to Santa Catarina) ..... *facialis* (Curran)

1. ***Cyrtophrys albimanus*** (Carrera), *N. comb.*

*Mirolestes albimanus* Carrera, 1949: 114, fig. 94 (antenna). Type-locality: Brazil, Guanabara, Rio de Janeiro. Type ♀, MZUSP. Ref. — Martin & Papavero, 1970: 31 (cat.).

This species is only known from the types; ♂ unknown.

Material examined: Holotype ♀, BRAZIL: *Guanabara*, Rio de Janeiro, iv.1938 (Serviço de Febre Amarela), and 1 paratype ♀, *Rio de Janeiro*: Petrópolis, iv.1938 (Serviço de Febre Amarela), both in MZUSP.

## 2. *Cyrtophrys attenuatus* (Loew)

*Dasypogon (Cyrtophrys) attenuatus* Loew, 1851: 3. Type-locality: "Brazil" (probably Nova Friburgo, State of Rio de Janeiro; cf. Papavero, 1971b). Type ♀, ZMB.

*Dioctria tenuis* Walker, 1851: 86. Type-locality: "South America". Type ♀, BMNH (examined in 1970). Refs. — Williston, 1891: 69 (cat.); Kertész, 1909: 114 (cat.). *N. SYN.*

*Cyrtophrys attenuatus*; Williston, 1891: 74 (cat.; as "Chile", in error); Kertész, 1909: 119 (cat.); Carrera, 1949: 121; Martin & Papavero, 1970: 30 (cat.).

*Mirolestes barbiellini* Curran, 1935: 1. Type-locality: Brazil, São Paulo. Type ♂, AMNH (examined in 1968). Refs. — Carrera, 1949: 113, figs. 10 (whole insect), 62 (head), 120 (palpus), 96 (antenna), 132, 134 (legs), 181 (wing); Carrera & Vulcano, 1961: 69 (preys); Martin & Papavero, 1970: 31 (cat.). *N. SYN.*

*Mirolestes tenuis*; Martin & Papavero, 1970: 31 (cat.).

Carrera's (1949) description applies perfectly well to this species. Male genitalia as in Figs. 93-95.

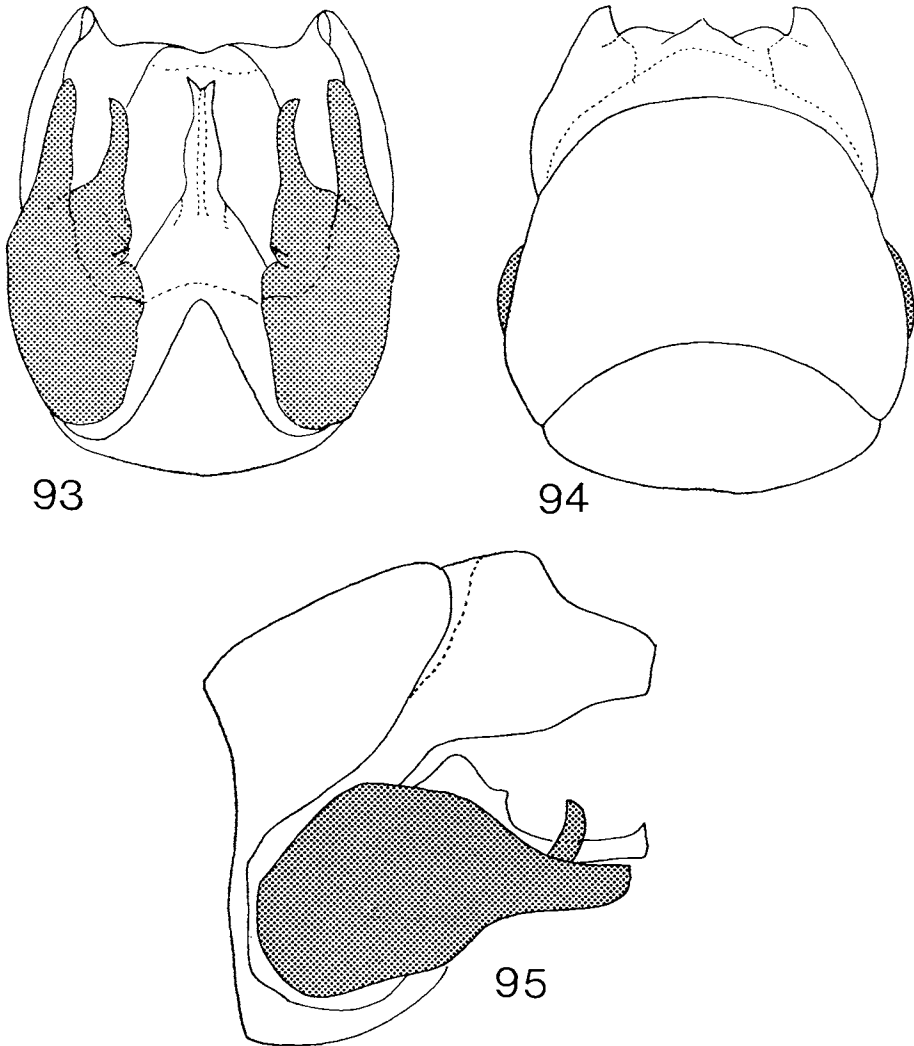
Material examined: Holotype ♀ of *Dioctria tenuis* Walker (BMNH), Holotype ♂ of *Mirolestes barbiellini* Curran (AMNH), plus following specimens. BRAZIL: *Minas Gerais*: Calado (Mun. Ferros), Rio Doce, ii.1939 (Martins & Lopes), 1 ♀; *Guanabara*: Rio de Janeiro (Palmeiras), i.1939 (Lopes), 1 ♂; *Rio de Janeiro*: Itatiaia, ii.1957 (Vulcano), 1 ♀; Sepetiba, i.1967 (Vulcano), 1 ♀; Nova Friburgo (Muri), xii.1965 (G. & J. H. Guimarães), 5 ♂, 4 ♀; *São Paulo*: Capital, iv.1926 (Barbiellini), 1 ♂, 1 ♀; Idem (Santo Amaro), xi.1958 (Lane), 1 ♂; Idem (Cantareira), ii.1944 (Ramalho), ii.1952 (Vulcano), 2 ♀; Idem (Cidade Jardim), xii.1945 (Barretto), 1 ♂; Cajuru, Coqueiros, ii.1947 (Barretto), 2 ♂; Campos do Jordão, i.1936 (Lane), 1 ♂, ii.1953 (Travassos F.º), 1 ♀; Itu (Faz. Pau d'Alho), x.1960 (Vulcano), 1 ♀. All in MZUSP.

## 3. *Cyrtophrys facialis* (Curran), *N. comb.*

*Mirolestes facialis* Curran, 1935: 2. Type-locality: Brazil, São Paulo. Type, AMNH (examined in 1968). Refs. — Carrera, 1949: 116, fig. 97 (antenna; as *fascialis*, error).

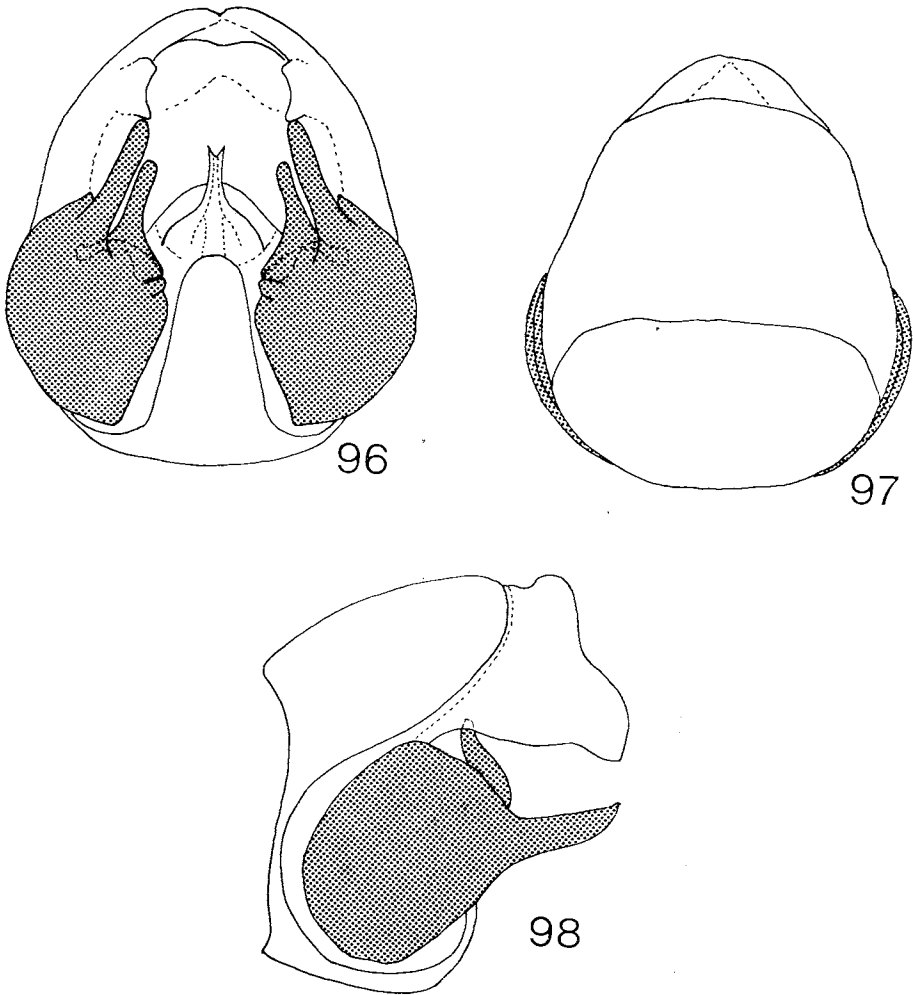
*Mirolestes pleuralis* Curran, 1935: 3. Type-locality: Brazil, São Paulo. Type, AMNH (examined in 1968). Refs. — Carrera, 1949: 116 (as syn. of *lynchii*, in error); Martin & Papavero, 1970: 31 (syn. with *facialis*, upon examination of type).

Carrera's (1949) description applies well to this species. Male genitalia as in Figs. 96-98.



*Cyrtophrys attenuatus* (Loew), male genitalia: 93, ventral; 94, dorsal; 95, lateral.

Material examined: Holotypes of *Mirolestes facialis* and *M. pleuralis* Curran (AMNH), plus following specimens. BRAZIL: *Rio de Janeiro*: Itatiaia, 600-1000 m, iv.1945 (Barretto), 6 ♂, 5 ♀; *Guanabara*: Rio de Janeiro (Palmeiras), i.1939 (Lopes), 1 ♀; *São Paulo*: Campos do Jordão, iii.1945 (Wygodzinsky), 2 ♂, 1 ♀; Idem, iii.1945 (Ramalho), 1 ♀, v.1954 (Lima), 1 ♀; Barueri, iii-iv.1955 (Lenko), 1 ♂, 1 ♀; São Paulo (Capital), iv.1926 (Barbiellini), 1 ♀; São Paulo (Santo Amaro), ii.1949 (Lane), 1 ♀; ii.1950 (Coher), 1 ♀; São Paulo (Osasco), iv.1939, iv.1943 (Lane), 1 ♂, 1 ♀; *Santa Catarina*: Nova Teutônia, iv.1938 (Plau-mann), 1 ♀. All in MZUSP.



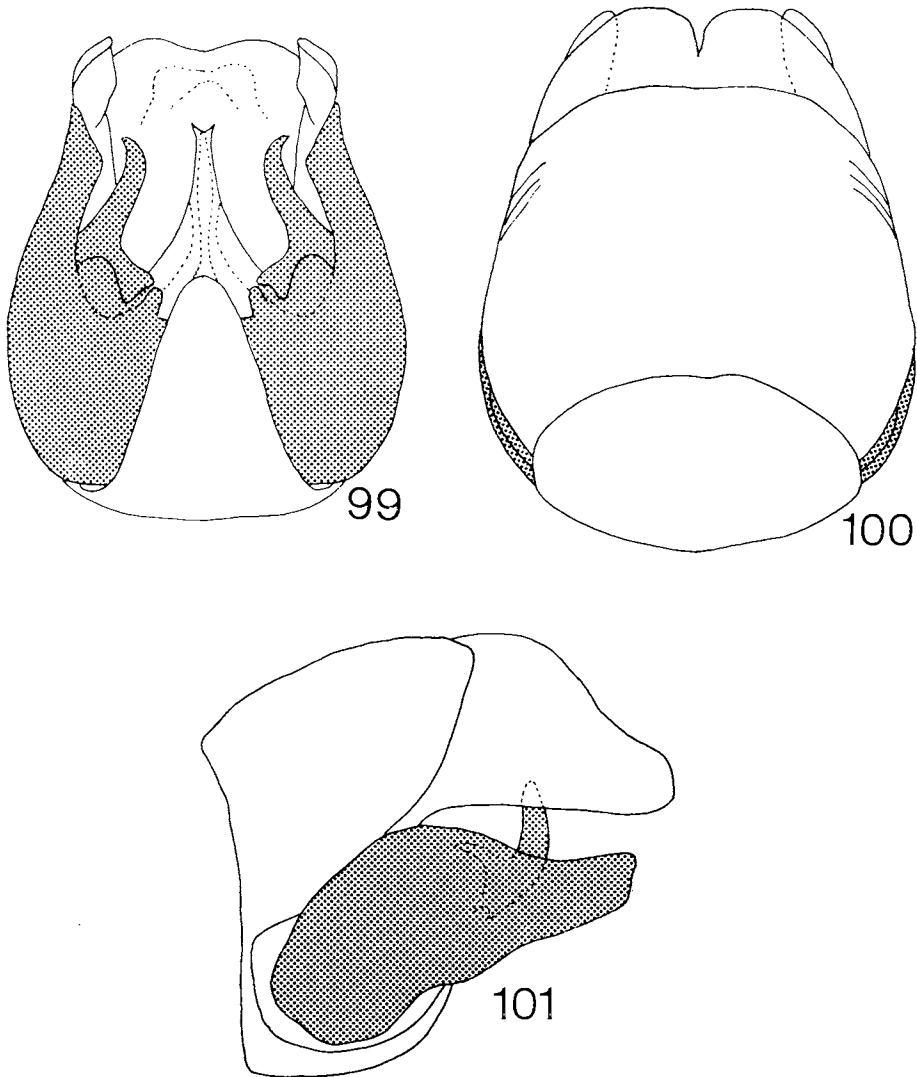
*Cyrtophrys facialis* (Curran), male genitalia: 96, ventral; 97, dorsal; 98, lateral.

4. *Cyrtophrys lynchii* (Brèthes), *N. comb.*

*Myolestes lynchii* Brèthes, 1904: 338. Type-locality: Argentina, Tucumán.  
Type, ?

*Mirolestes lynchii*; Curran, 1935: 1 (in key); Carrera, 1949: 116, figs. 59  
(head), 95 (antenna); Martin & Papavero, 1970: 31 (cat.).

Carrera (1949) redescribed this species. Male genitalia as in Figs.  
99-101.



*Cyrtophrys lynchii* (Brèthes), male genitalia: 99, ventral; 100, dorsal;  
101, lateral.

Material examined: BRAZIL, *Mato Grosso*: Maracaju, v.1957 (Serviço de Febre Amarela), 1 ♂; *São Paulo*: Barueri, v.1961 (Lenko), 1 ♂; *Paraná*: Ponta Grossa, xi.1945 (Machado), 1 ♀; *Santa Catarina*: Nova Teutônia, i.1937, ii.1938, i-ii.1971 (Plaumann), 31 specimens. All in MZUSP.

### 5. *Cyrtophrys* sp.

An imperfectly preserved specimen from VENEZUELA, State of Carabobo, Valle Seco, i.1940 (Anduze) (♀). This specimen cannot be identified; it is completely out of the distribution range of *Cyrtophrys* in southeastern and southern Brazil. More material will be needed to establish its identity.

### Genus *Deromyia* Philippi

*Deromyia* Philippi, 1865: 705. Type-species, *gracilis* Philippi (Williston, 1901: 311, as of Rondani, in error) = *fuscipennis* (Blanchard). Refs. — Williston, 1901: 310; Carrera, 1949: 63; Artigas, 1961: 5-9; Hull, 1962: 249; Martin & Papavero, 1970: 31 (cat.); Artigas, 1970: 112 (rev.).

Similar to *Cyrtophrys*, but 3rd antennal segment shorter, clavate, with well-developed apical style. For the history of this genus, especially its confusion with *Diogmites* Loew, see Carrera (1949) and Artigas (1961). Artigas (1970) redescribed the 2 species of this genus.

Key to species (Artigas, 1970: 113)

1. Face silvery; wings hyaline; some of the bristles of the middle legs as long as 1st tarsal segment; males and females with black abdomen ..... *nigriventris* (Bigot)
- Face yellow or coffee-colored; wings infuscated in females, dark-coffee colored in males; bristles of middle tibiae never longer than second tarsal segment; females with abdomen almost entirely reddish, a shining black spot on tergite 2; males with almost entirely black abdomen ..... *fuscipennis* (Blanchard)

#### 1. *Deromyia fuscipennis* (Blanchard)

*Gonypus fuscipennis* Blanchard, 1852: 371, pl. 1, figs. 6a-b (Whole insect, antenna, tarsus). Type-locality: Chile, Santiago. Type lost. Neotype ♂ (Artigas, 1970: 114), Departamento de Zoología, Universidad de Concepción, Chile.

*Leptogaster fuscipennis*; Walker, 1855: 771.

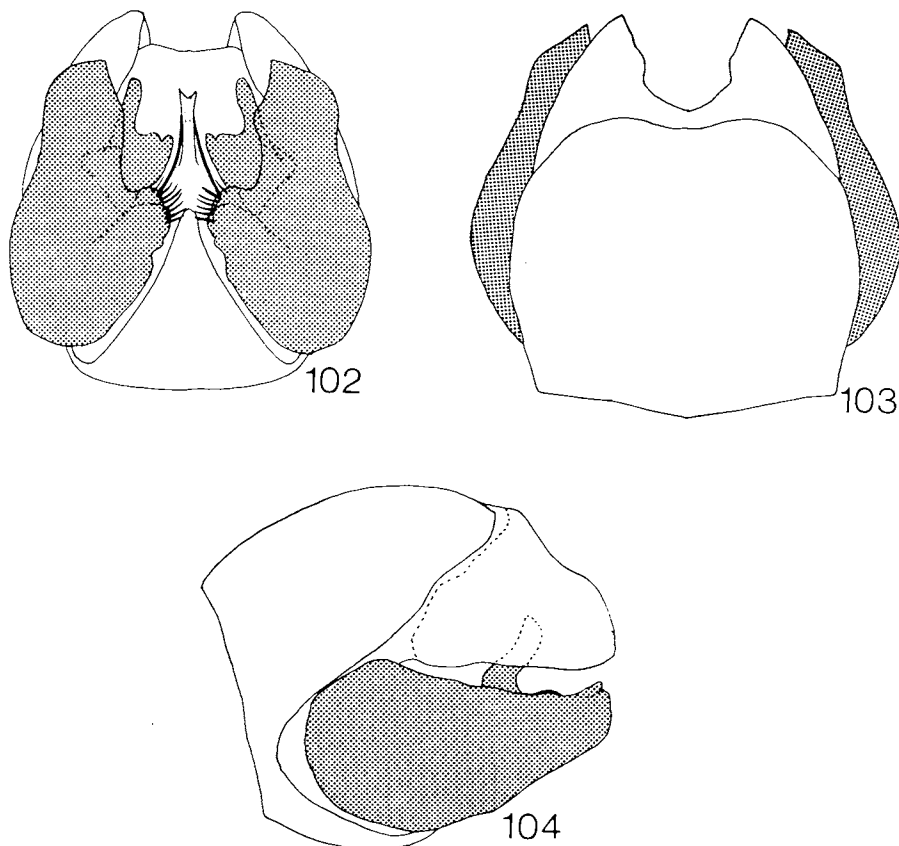
*Leptogaster fuscipennis*; Philippi, 1865: 705 (error).

*Deromyia fuscipennis*; Philippi, 1865: 706 (error); Williston, 1891: 75 (cat.; error).

*Deromyia gracilis* Philippi, 1865: 706, pl. 26, figs. 29 (whole insect), 29a (head). Type-locality: "Chile". Type lost. Refs. — Williston, 1891: 75 (cat.); 1901: 311; Kertész, 1909: 116 (cat.); Stuardo, 1946: 82 (cat.); Carrera, 1949: 122; Artigas, 1961: 5, fig. 2 (protibial spur), 4 (antenna), 6 (wing detail); Hull, 1962: 250, fig. 532 (wing), 1089 (head), 1098 (head).

*Deromyia fuscipennis*; Kertész, 1909: 116 (cat.); Bromley, 1932: 267; Stuardo, 1946: 82 (cat.); Carrera & Papavero, 1962: 61; Martin & Papavero, 1970: 31 (cat.); Artigas, 1970: 113 (descr.), figs. 173 (whole insect), 174 (wing), 175 (male genitalia), 176 (aedeagus), 177 (male antenna), 178 (female antenna), 441 (distribution).

Male genitalia as in Figs. 102-104.



*Deromyia fuscipennis* (Blanchard), male genitalia: 102, ventral; 103, dorsal; 104, lateral.

Material examined: CHILE: *Santiago*: "Chacabuco", xi.1936 (no collector), 1 ♂; Rio Maipo, i.1970 (Peña), 6 ♂; Rincón El Arbol, Aculeo, x.1969 (Peña), 1 ♂; *Curicó*: Los Morongos, xii.1967 (Peña), 4 spec.; *Arauco*: Peillem-Pilli, 700-1000 m, i.1954 (Peña); Angol, iv.1936 (Peña). All in MZUSP.

## 2. *Deromyia nigriventris* (Bigot)

*Lochites nigriventris* Bigot, 1878: 427. Type-locality: "Chile". Type, OXF (examined in 1970). Ref. — Kertész, 1909: 125 (cat.).

*Senobasis nigriventris*; Williston, 1891: 75 (cat.), Stuardo, 1946: 82; Hull, 1962: 422.

*Lochitomyia nigriventris*; Brèthes, 1925: 105.

*Deromyia nigriventris*; Martin & Papavero, 1970: 31 (erroneously as syn. of *fuscipennis*); Artigas, 1970: 116 (descr.), figs. 179 (male genitalia), 180 (aedeagus), 446 (distribution).

*Deromyia nigriventris*; Artigas, 1970: 113 (error).

Material examined: Holotype of *Lochites nigriventris* Bigot (OXF).

### 5.3. SUBTRIBE LAGODIINA, NEW

Marginal cell open; fourth posterior cell open; anal cell open or closed at wing margin; post-scutellar callosities bare, only micropubescent; acrosticals present; female with 8 tergites, terminalia formed by segment 9, with spinous acanthophorites; male genitalia with hypandrium short, robust, mammiform. Old World (predominantly African).

Type-genus, *Lagodias* Loew.

The Lagodiina differ from the closely related Cyrtophryina and Senobasiina by the open fourth posterior cell and by the structure of the male genitalia.

Key to genera

1. Mesonotum and scutellum with reduced pilosity; anal cell open ...  
..... *Lagodias* Loew
- Mesonotum and scutellum with a dense covering of hairs; anal cell  
closed at margin ..... *Pegesimallus* Loew

### Genus *Lagodias* Loew

*Dasypogon*, subg. *Laparus* Loew, 1851: 4 (preocc., Agassiz, 1845). Type-species, *tabidus* Loew (mon.).



*Lagodias* Loew, 1858: 345. Type-species, *albidipennis* Loew (mon.). Refs. — Hull, 1962: 256, figs. 16 (whole insect), 185, 99A-B, 128 (antenna), 523 (wing), 1051, 1060 (head), 1598 (palpus).

*Neolaparus* Williston, 1889: 255 (nom. nov. for *Laparus* Loew). Type-species, *Laparus tabidus* Loew (aut.). Refs. — Karsch, 1886; Hermann, 1907; Ricardo, 1900; Speiser, 1910; Bezzi, 1914; Ricardo, 1925; Curran, 1927; Engel, 1929; Bromley, 1934a, 1935, 1936, 1945; Oldroyd, 1939; Janssens, 1953; Lehr, 1958; Oldroyd, 1960; Hull, 1962: 252, figs. 520, 573 (wing), 1090, 1099 (head), 1768 (male genitalia), 1991, 1970 (female terminalia); Oldroyd, 1970: 258. *N. SYN.*

*Cenopogon* Wulp, 1898: 120. Type-species, *bifidus* Wulp (mon.). = *volcatus* (Walker). *N. SYN.*

Face 1/3 total width of head, prominent throughout and more so at epistoma; 3rd antennal segment generally clavate, with evident apical style; palpus 2 or 1 segmented; thorax slightly convex, almost plane; acrosticals present; scutellum without bristles, sometimes with small bristles laterally; pilosity of thorax and scutellum little developed; post-scutellar callosities micropubescent only; wings with all cells open; male with 8 or 7 tergites; females with 8 tergites, terminalia formed by segment 9, with spinous acanthophorites; first abdominal tergites with "bul-lae"; male with hypandrium short and robust, mammiform; male genitalia rotated of 180°.

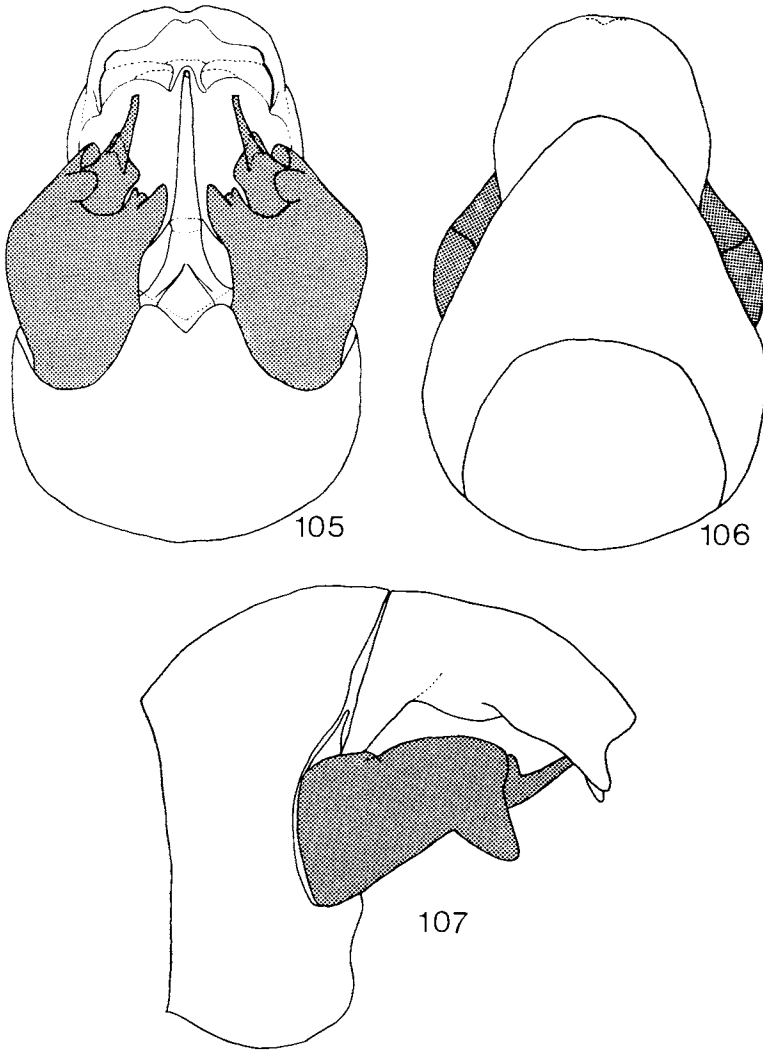
Taxonomic discussion: *Lagodias* Loew was separated by Hull (1962: 256) from the nominal genera *Neolaparus* Williston and *Pegesimallus* Loew because it does not have a pencil of bristly, compact, small, suberect hairs, on the metapleura, above coxa-2; this was the only character distinguishing *Lagodias* from *Neolaparus*. However, as already pointed out by Oldroyd (1970: 259) "This is true of the type-species of each genus, but is not a valid generalization. This patch of pile is widespread among many genera of this and other tribes, e. g. *Laphria*, but it appears sporadically, and may be present or absent in species that are clearly congeneric". Indeed, specimens of "*Neolaparus*" from India (Devala, Nilgiri Hills) that I have examined, do not show the slightest vestige of metapleural pencil of small bristles; males of this species do not show the dense covering of scales on the legs, which should characterize males of *Lagodias*, without the pencil (according to Hull). Other species of "*Neolaparus*" also lack the metapleural pencil.

Based on the fact that the dense covering of scales on the legs of some species is a secondary sexual character (limited to males), and that the only character used for the separation of *Lagodias* and *Neolaparus* (the metapleural pencil of small bristles) is not steady as a diagnostic character, I propose the synonymy of the two nominal genera.

#### List of the species of *Lagodias* Loew

1. *albicinctus* (Ricardo), 1900: 166 (*Laparus*). — South Africa. *N. comb.*

2. *albidipennis* Loew, 1858: 345. — South Africa. Refs. — Loew, 1860b: 70, pl. 1, figs. 38-39; Hermann, 1906: 144.
3. *alcippe* (Walker), 1849: 338 (*Dasypogon*). — South Africa. *N. comb.*
4. *anaxilas* (Walker), 1849: 324 (*Dasypogon*). — South Africa. *N. comb.*
5. *angusticornis* (Ricardo), 1925: 245 (*Neolaparus*). — Malawi, Congo, South Rhodesia. *N. comb.*



*Lagodias* sp. (India), male genitalia: 105, ventral; 106, dorsal; 107, lateral.

6. *apertus* (Karsch), 1886: 72 (*Laparus*). — Gabon. *N. comb.*
7. *apicalis* (Bromley), 1936: 144 (*Neolaparus*). — South Rhodesia. *N. comb.*
8. *atrimaculatus* (Oldroyd), 1960: 263 (*Neolaparus*). — Madagascar. *N. comb.*
9. *atrox* (Bromley), 1936: 141 (*Neolaparus*). — South Africa. *N. comb.*
10. *aulicus* (Wiedemann), 1828: 379 (*Dasypogon*). — South Africa. *N. comb.*  
     *anticus* Loew, 1860b: 57 (*Laparus*), error.  
     *maculiventris* Loew, 1858: 343 (*Laparus*). — South Africa.
11. *banana* (Curran), 1927: 3 (*Neolaparus*). — Congo. *N. comb.*
12. *bicolor* (Loew), 1858: 344 (*Laparus*). — South Africa. *N. comb.*
13. *bivittatus* (Curran), 1934a: 3 (*Neolaparus*). — South Rhodesia. Ref.: — Engel & Cuthbertson, 1934: 45 (sep., p. 11), fig. 7. *N. comb.*
14. *braunsi* (Bromley), 1936: 145 (*Neolaparus*). — South Africa. *N. comb.*
15. *caliginosus* (Loew), 1858: 343 (*Laparus*). — South Africa. Ref. — Engel, 1929: 164. *N. comb.*
16. *clausus* (Loew), 1860b: 66 (*Laparus*). — South Africa. *N. comb.*
17. *coei* (Oldroyd), 1964b: 243 (*Neolaparus*). — Nepal. *N. comb.*
18. *cuneatus* (Loew), 1858: 343 (*Laparus*). — South Africa. *N. comb.*
19. *decoratus* (Oldroyd), 1970: 259 (*Neolaparus*). — Congo. *N. comb.*
20. *diasi* (Oldroyd), 1961: 47 (*Neolaparus*). — Mozambique. *N. comb.*
21. *dimidiatus* (Bromley), 1936: 144 (*Neolaparus*). — South Africa. *N. comb.*
22. *esuriens* (Bromley), 1936: 146 (*Neolaparus*). — South Africa. *N. comb.*
23. *faustus* (Karsch), 1886: 71 (*Laparus*). — South Africa. *N. comb.*
24. *ferroxidus* (Hull), 1967: 246 (*Neolaparus*). — South Africa. *N. comb.*
25. *foedus* (Loew), 1863: 10 (*Laparus*). — South Africa. *N. comb.*
26. *fugax* (Bromley), 1936: 142 (*Neolaparus*). — Malta. *N. comb.*
27. *fulvipennis* (Bromley), 1936: 142 (*Neolaparus*). — South Africa. *N. comb.*
28. *funestus* (Loew), 1858: 344 (*Laparus*). — South Africa. *N. comb.*

29. *gracilipes* Loew, 1858: 343. — South Africa.
30. *griseus* Oldroyd, 1970: 261. — Congo.
31. *holotaenia* (Speiser), 1910: 87 (*Neolaparus*). — Kilimandjaro. *N. comb.*
32. *inermis* Hermann, 1907: 14 (1908: 164, also proposed as "sp. n.). — Kalahari.
33. *laticornis* (Loew), 1858: 337 (*Laparus*). — South Africa. *N. comb.*
34. *letifer* (Walker), 1851: 89 (*Dasyopogon*). — South Africa. *N. comb.*
35. *limbatus* (Oldroyd), 1960: 264 (*Neolaparus*). — Madagascar. *N. comb.*
36. *limbithorax* (Macquart), 1846: 188 (1846: 60), pl. 6, fig. 6 (*Dasyopogon*). — South Africa. *N. comb.*
37. *longicornis* (Curran), 1927: 2 (*Neolaparus*). — Congo. *N. comb.*
38. *lubumbashi* (Bromley), 1935: 413 (*Neolaparus*). — Congo. *N. comb.*
39. *marginatus* (Hull), 1967: 245 (*Neolaparus*). — Basutoland. *N. comb.*
40. *medius* (Oldroyd), 1960: 265 (*Neolaparus*). — Madagascar. *N. comb.*
41. *melasomus* (Loew), 1858: 344 (*Laparus*). — South Africa. *N. comb.*
42. *mesasiaticus* (Lehr), 1958: 756 (*Neolaparus*). — Caucasus, Kazakhstan, China, Mongolia, Central Asia. Ref. — Richter, 1960: 103; 1964: 341; 1968: 133. *N. comb.*
43. *metallicus* (Bromley), 1936: 141 (*Neolaparus*). — South Africa. *N. comb.*
44. *moerens* (Wiedemann), 1828: 399 (*Dasyopogon*). — Sierra Leona. *N. comb.*
45. *morio* (Bezzi), 1914: 286 (*Neolaparus*). — Ref. — Oldroyd, 1970: 262 (believes it is a *Pegesimallus*: I have seen the ♂ ♀ syntypes at TORO, and this is really a *Lagodias*). — Senegal. *N. comb.*
46. *munroi* (Bromley), 1936: 142 (*Neolaparus*). — Congo, South Africa. *N. comb.*
47. *niger* (Bromley), 1936: 144 (*Neolaparus*). — South Africa. *N. comb.*
48. *ophion* (Speiser), 1910: 86 (*Neolaparus*). — Kilimandjaro. *N. comb.*
49. *oralis* (Wulp), 1884: cclxxxix (*Laparus*). — Guinea. *N. comb.*

50. *ornatus* (Bromley), 1936: 143 (*Neolaparus*). — South Africa. *N. comb.*
51. *pedunculatus* (Loew), 1858: 343 (*Laparus*). — South Africa. *N. comb.*
52. *polistoides* (Oldroyd), 1960: 266 (*Neolaparus*). — Madagascar. *N. comb.*
53. *pollinosus* (Bromley), 1936: 141 (*Neolaparus*). — South Africa. *N. comb.*
54. *pulchellus* (Bromley), 1936: 143 (*Neolaparus*). — South Africa. *N. comb.*
55. *pulchriventris* (Loew), 1858: 342 (*Laparus*). — South Africa, Kalahari. *N. comb.*
56. *rubrifemoratus* (Bromley), 1935: 414 (*Neolaparus*). — Congo. *N. comb.*
57. *rufus* (Bromley), 1936: 145 (*Neolaparus*). — South Africa. *N. comb.*
58. *saeptus* (Oldroyd), 1960: 267 (*Neolaparus*). — Madagascar. *N. comb.*
59. *sepiapennis* (Hull), 1967: 247 (*Neolaparus*). — Basutoland. *N. comb.*
60. *silaceus* (Hermann), 1907: 66 (*Laparus*). — South Africa, South Rhodesia. Ref. — Engel, 1929: 164. *N. comb.*
61. *similis* (Curran), 1927: 4 (*Neolaparus*). — Congo. Ref. — Bromley, 1951a: 45. *N. comb.*
62. *singularis* (Bromley), 1936: 144 (*Neolaparus*). — South Africa. *N. comb.*
63. *solus* (Bromley), 1936: 145 (*Neolaparus*). — South Africa. *N. comb.*
64. *squalidus* (Loew), 1858: 344 (*Laparus*). — South Africa. *N. comb.*
65. *tabidus* (Loew), 1851: 4 (*Dasypogon*). — Locality unknown. Ref. — Marshall, 1902: pl. 21, fig. 21. *N. comb.*
66. *tapulus* (Walker), 1849: 351 (*Dasypogon*). — South Africa. *N. comb.*
67. *teratodes* Hermann, 1906: 141, pl., figs. 8-10. — East Africa.
68. *testaceus* (Bigot), 1878: 425 (*Lochites*). — Birmania, India. *N. comb.* (Type seen, OXF, 1970).
69. *trifasciatus* (Oldroyd), 1939: 30 (*Neolaparus*). — Congo, Uganda, Kenya. *N. comb.*

70. *urundianus* (Janssens), 1953: 13, figs. 13-14 (*Neolaparus*). — Urundi. *N. comb.*
71. *videns* (Walker), 1851: 93 (*Dasygogon*). — "Africa". *N. comb.*
72. *volcatus* (Walker), 1849: 346 (*Dasygogon*). — "East Indies"; Western China (Hainan), India, Himalayas, Java, Taiwan. *N. comb.*  
*hypsaon* Walker, 1849: 348 (*Dasygogon*). — China.  
*cerco* Walker, 1848: 349 (*Dasygogon*). — China. Ref. — Bromley, 1945: 95.  
*bifidus* Wulp, 1898: 121, pl. 3, figs. 6-7 (*Cenopogon*). — Java.

## UNPLACED SPECIES

- ? *albopunctatus* (Macquart), 1846: 193 (1846: 65), pl. 6, fig. 7 (*Dasygogon*). — Australia. Not Megapodini.  
 ? *spinther* Walker, 1849: 337 (*Dasygogon*). — Australia.

Genus *Pegesimallus* Loew

- Pegesimallus* Loew, 1858: 344. Type-species, *ursinus* Loew (mon.). Ref. — Hull, 1962: 254, figs. 224 (antenna), 580 (wing), 1086, 1095 (head), 1735 (male genitalia).  
*Pagesimallus* Verrall in Scudder, 1882: 243, error.

Face almost 2/5 of total width of head, very prominent throughout; palpi 2-segmented; antennal style developed; thorax slightly convex, densely pilose, differing in that respect from *Lagodias*; acrosticals and dorso-centrals present; scutellum densely pilose all over disc and on margin; post-scutellar callosities only micropubescent; wings with marginal and 4th posterior cells open; anal cell closed at wing margin; posterior margin of 1st abdominal tergite with bullae; males with 7, females with 8 tergites; female terminalia formed by segment 9, with spines on acanthophorites; male genitalia similar to *Lagodias*, but not rotate.

Taxonomic discussion: According to Oldroyd (1970: 262) "*Pegesimallus* is closely related to *Neolaparus* and *Lagodias*, and only to be distinguished by being covered with abundant, rather long, soft hairs. Hull's claim that *Pegesimallus*, like *Neolaparus*, has the small, compact hair-tuft on the hypopleuron, whereas *Lagodias* has not, is apparently not valid. The present specimen of *P. saegeri* Oldroyd has no such tuft, although in proportions of body and head, as well as in general hairiness, its affinities clearly lie with *Pegesimallus* rather than with the stark bare flies that are typical of *Neolaparus*."

List of the species of *Pegesimallus* Loew

1. *apicalis* Bromley, 1947: 110. — South Africa.
2. *claelius* (Walker), 1849: 351 (*Dasyopogon*). — South Africa.
3. *saegeri* Oldroyd, 1970: 262, fig. 37. — Congo.
4. *ursinus* Loew, 1858: 345. — South Africa. Refs. — Loew, 1860b: 69, pl. 1, fig. 37; Ricardo, 1925: 246 (considers it as possible synonym of *claelius*).

## 5.4. SUBTRIBE MEGAPODINA CARRERA

Megapodini Carrera, 1949: 5.

Marginal cell closed; if open, then face strongly concave medianly, projected in the form of a thick lip inferiorly; post-scutellar callosities with erect hairs; females with 7 tergites, the terminalia formed by segment 8; males with hypandrium short and wide, strongly concave medianly. Sonoran Desert to Southern Brazil.

Type-genus, *Megapoda* Macquart.

## Key to genera

1. Antennal style present, partially fused to third antennal segment, or well-developed; face strongly prominent throughout its extension ..... 2  
     Antennal style completely absent; face strongly concave, projected below into a very thick lip (Sonoran Desert to southern Brazil) ..... *Pseudorus* Walker
2. Antennal style well-developed; face with a central, triangular, yellow pollinose area, almost bare of hairs; frons with longitudinal sulci; legs moderately long and robust (Peru, Chile) .....  
     ..... *Pronomopsis* Hermann
- Antennal style partially fused to third antennal segment; face never as above; legs long and slender; anterior basitarsus as long as the sum of the following other four tarsomeres; frons with lateral "bullae"; (Guiano-Brazilian subregion) ... *Megapoda* Macquart

Genus **Megapoda** Macquart

*Megapoda* Macquart, 1834: 288. Type-species, *cyanea* Macquart (mon.) = *labiata* (Fabricius). Refs. — Walker, 1855: 508; Bigot, 1857b: 541; Schiner, 1866: 663; Roeder, 1887: 76; Williston, 1889: 256;

1891: 77 (cat.; part); Kertész, 1909: 161 (cat.; part); Hermann, 1912: 16; Carrera, 1949: 6, 1952: 62; Hull, 1962: 423, figs. 247 (antenna), 635 (wing), 1275, 1284 (head), 1564 (tibial apex), 1568 (tibial spur and flange of basitarsus), 1816, 2111 (male genitalia), 2139 (female terminalia); Martin & Papavero, 1970: 55 (cat.).

Medium-sized or large flies (up to 40 mm); face narrow, 1/4 total width of head, prominent throughout its length; frons narrow, with lateral "bullae"; proboscis very long and slender; palpus long, slender, with only 1 segment; antennal style partially fused to third antennal segment, as a lateral rim; thorax slightly convex; acrosticals absent; dorsocentrals reduced; scutellars absent; post-scutellar callosities with hairs; wings with marginal, 4th posterior and anal cells closed and petiolate; legs very long and slender, the hind femur distinctly longer than the median one; anterior basitarsus very long, as long as the other four tarsomeres together; abdomen without "bullae" on the posterior margin of the first tergites; males and females with 7 tergites; female terminalia formed by segment 8, conical; males with large and robust gonopods (especially when seen in lateral view), aedeagus with a deep apical cleft, hypandrium short and wide, with a deep median concavity.

#### **Megapoda labiata** (Fabricius)

*Laphria labiata* Fabricius, 1805: 160. Type-locality: "America Meridionali" (Smidt) (Guyana, between rivers Demerara and Essequibo; cf. Papavero, 1971b: 21-22). Type, Universitetets Zoologiske Museum, Copenhagen. Refs. — Wiedemann, 1821: 232; 1828: 499; Walker, 1849: 371.

*Dasyogon rufimanus* Perty, 1833: 181, pl. 36, fig. 6 (whole insect). Type-locality: Brazil, Guanabara, Rio de Janeiro (as "Sebastianopolis"). Type lost (I was not able to find it at the ZSBS in 1972).

*Megapoda labiata*; Macquart, 1838: 59 (1839: 175); Walker, 1855: 509; Schiner, 1866: 690; Wulp, 1882: 103; Roeder, 1887: 76; Williston, 1889: 256; 1891: 77 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 18; Carrera, 1949: 7, fig. 1 (whole insect); 1952: 62, figs. 13-14 (cerci and part of ring formed by 9th segment of male genitalia), 15-16 (cerci), 17-18 (gonopods, internal view), 19-20 (aedeagus and gonopods, internal view), 19-20 (aedeagus and gonopods); 1960: 157; Martin & Papavero; 1970: 55 (cat.).

*Megapoda cyanea* Macquart, 1834: 288. Type-locality: "Brazil". Type lost (I was not able to find it at the MNHN in 1972). Ref. — Macquart, 1838: pl. 5, fig. 3 (whole insect).

*Megapoda rufimanus*; Kertész, 1909: 161 (as syn. of *labiata*).

Carrera (1952: 62) found some differences between the male genitalia of specimens from Rio de Janeiro, Espírito Santo, and Bahia, on



one hand, and others from Rio de Janeiro and Amazonas, on the other. Differences are mainly in the shape of the cerci and, in lesser degree, in the shape of the ring formed by the fusion of epandrium and hypandrium. It is possible that two species occur, both sympatric in Rio de Janeiro. However, as the present material is relatively scarce, especially from one of these forms, it is impossible to tell whether these two forms are different species, or a mere variation in the genitalia. I am adopting here the opinion of preceding authors, considering only one species, until the situation can be clarified.

Male genitalia as in Figs. 108-110.

Material examined: "South America", 1 ♂, 1 ♀ (BMNH). PERU: Iquitos (no other data) (BMNH). BRAZIL: *Amazonas*: São Paulo de Olivença, vii.1935 (Zellibor-Hauff), 1 ♂; Maués, ii.1924, and Rio Maués, ii.1924 (Le Moulton) (BMNH); Benjamin Constant, Rio Javari, iii.1942 (Rabault), 1 ♂ (AMNH); no other data, 1 ♂ (MNH); *Pará*: Óbidos, 1954 (no collector), 1 ♂; ix.1959 (Oliveira), 1 ♂; ix.1962 (Brazilino), 1 ♂; Faz. Taperinha, Santarém, ii.1968 (Papavero), 1 ♂; *Paraíba*: Mamanguape, vii.1957 (Exp. Dep. Zool.), 1 ♂ (JW); *Bahia*: São João da Água Preta, Ilhéus, ix-x.1928 (May), 1 ♂ (MNRJ); *Mato Grosso*: Maracaju, ii.1937 (no collector), 1 ♀; Barra do Tapirapés, xii.1962 (Malikin), 1 ♀ (CAS); *Minas Gerais*: Mar de Espanha, xi.1910 (A. Lutz), 1 ♀ (MNRJ); do., 1 ♂ (MZUSP); *Rio de Janeiro*: Teresópolis, iv.1938 (Serviço de Febre Amarela), 1 ♀; Serra dos Órgãos, x-xii.1940 (Pariko), 1 ♀; *Guanabara*: "Rio" (H. H. Smith) ♂ (AMNH); Rio de Janeiro (Corcovado), x.1963 (Alvarenga & Seabra), 1 ♂; Rio de Janeiro (Paineiras), vii.1933 (no collector), 1 ♀; Represa Rio Grande, x.1960 (Oliveira), 1 ♂, 1 ♀; *São Paulo*: Piracicaba, ii.1967 (Rocha), 1 ♀. Unless otherwise stated, all in MZUSP.

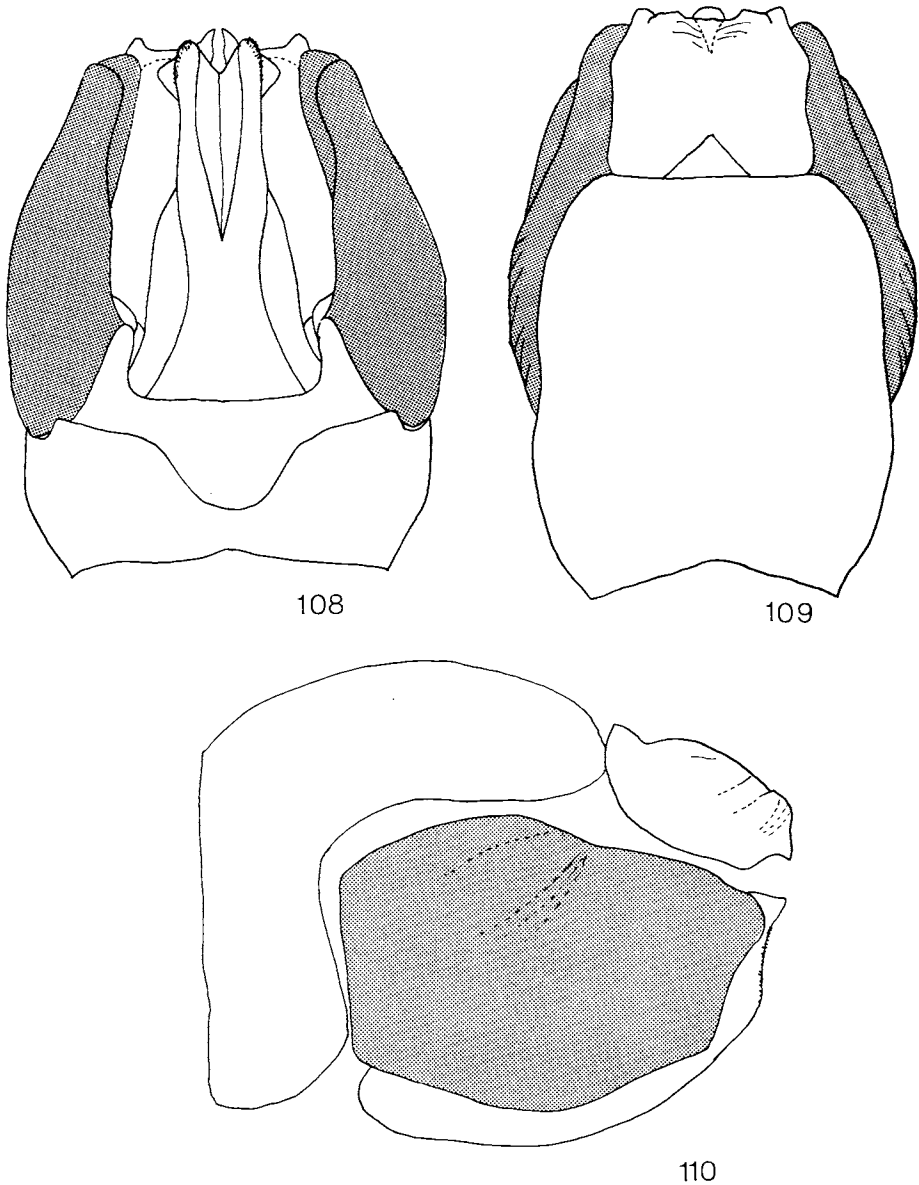
Carrera (1952: 62) cited a specimen from Espírito Santo, captured by Garbe in 1906; according to Pinto (1945) Ernest Garbe collected in the area of Santa Leopoldina and Linhares, whence probably came the specimen.

### Genus *Pronomopsis* Hermann

*Pronomopsis* Hermann, 1912: 18. Type-species, *chalybea* Hermann (orig. des.). Refs. — Carrera, 1949: 8; 1952: 64; Hull, 1962: 422, figs. 240 (antenna), 666 (wing), 1238, 1247 (head), 2105 (male genitalia), 2144 (female terminalia); Artigas, 1964: 1 (rev.); Martin & Papavero, 1970: 55 (cat.); Artigas, 1970: 252 (redescr., key to species).

Face more or less 1/3 of total width of head, strongly prominent and triangular in lateral view, prolonged into a curious beak, acute on

the apex, with a central, triangular, yellow pollinose area almost entirely bare; frons short, with longitudinal sulci; proboscis long; third antennal segment with well-developed, although small, apical style; across-



*Megapoda labiata* (Fabricius), male genitalia: 108, ventral; 109, dorsal; 110, lateral.

ticals absent; dorsocentrals indifferentiated from mesonotal pilosity; scutellars absent; post-scutellar callosities with hairs; legs moderately long and robust, with bristles short and thick; wings with marginal, 4th posterior and anal cells closed and petiolate; abdomen dorsoventrally compressed; males and females with 7 tergites; female terminalia formed by segment 8, triangular, flattened dorsoventrally; male hypandrium short and wide, medianly concave, epandrium trapezoidal, aedeagus with a characteristic apical "glans", with minute spines latero-apically.

Key to species (adapted from Artigas, 1970: 253)

1. Legs uniformly dark, almost black; antennae black (Argentina) . . .  
     . . . . . *chalybea* Hermann  
     Legs entirely or partially orange-red; antennae with third antennal  
     segment deeply red . . . . . 2
2. Tibiae and tarsi entirely red (Peru, Chile) . . . . *rubripes* Hermann  
     At least some parts of legs black . . . . . 3
3. Fore basitarsus and tibia yellow, remainder of legs black (Chile:  
     Antofagasta) . . . . . *talabrensis* Artigas  
     Femora, apex of tibiae and tarsi black; remainder of tibiae red (Peru:  
     Cusco) . . . . . *pseudorubripes* Lamas

### 1. *Pronomopsis chalybea* Hermann

*Pronomopsis chalybea* Hermann, 1912: 19, fig. 10 (wing), pl. 1, fig. 4 (head). Type-locality: Argentina, Mendoza. Type ♀, ZSBS (examined in 1972). Refs. — Carrera, 1949: 8; 1952: 60; Artigas, 1964: 8; Martin & Papavero, 1970: 56; Artigas, 1970: 253, fig. 411 (distribution).

Material examined: ARGENTINA, *Mendoza*: Potrerillos, 4000 ft, iii.1920 (Cornell Univ. Exp), 1 ♀ (AMNH). This is apparently the second specimen of this species reported.

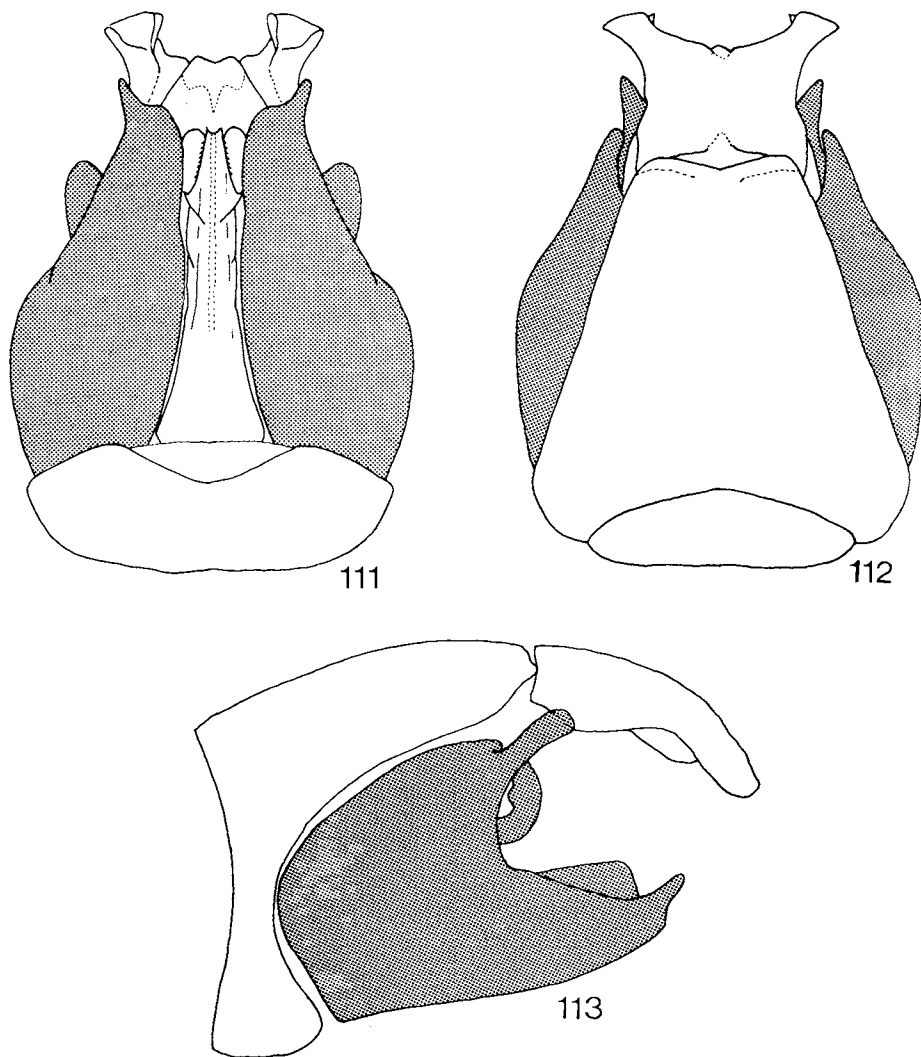
### 2. *Pronomopsis pseudorubripes* Lamas

*Pronomopsis pseudorubripes* Lamas, 1972: 312. Type-locality: Peru, Cusco. Type ♀, Departamento de Zoología y Entomología, Universidad Nacional "San Antonio Abad", Cusco.

This species is only known from the type.

### 3. *Pronomopsis rubripes* Hermann

*Pronomopsis rubripes* Hermann, 1912: 20. Type-locality: Peru, Juliaca, 4000 m. Type ♀, ZSBS (examined in 1972). Refs. — Artigas, 1964: 4 (redescr.), figs. 2, 4 (head), 9 (leg), 13 (wing), 5-6 (male genitalia), 10-11 (female terminalia); Hull, 1962: 423, figs. 240 (antenna), 660 (wing), 1238, 1247 (head), 2105 (male genitalia), 2144 (female terminalia); Martin & Papavero, 1970: 56 (cat.); Artigas, 1970: 254 (redescr.), figs. 213 (head), 215 (union thorax-abdomen), 216 (male genitalia), 217 (wing), 218 (male genitalia), 219 (aede-



*Pronomopsis rubripes* Hermann, male genitalia: 111, ventral; 112, dorsal; 113, lateral.

gus), 412 (distribution).

Male genitalia as in Figs. 111-113.

Material examined: CHILE: "Colchagua": Tumbre, ii.1952 (Peña), 1 ♂, 1 ♀ (according to Artigas, 1970: 255, Tumbres must be in Antofagasta); *Antofagasta*: Talabre, ii.1969 (Peña), 5 ♂, 3 ♀. All in MZUSP.

#### 4. *Pronomopsis talabrensis* Artigas

*Pronomopsis talabrensis* Artigas, 1964: 6, figs. 1, 3 (head), 12 (wing).  
Type-locality: Chile, Antofagasta, Talabre. Type, Instituto Central de Biología, Universidad de Concepción. Refs. — Martin & Papavero, 1970: 56 (cat.); Artigas, 1970: 256 (redescr.), fig. 468 (distribution).

Material examined: CHILE: *Antofagasta*: Talabre, ii.1969 (Peña), 3 ♂ (MZUSP).

#### Genus *Pseudorus* Walker

*Pseudorus* Walker, 1851: 103. Type-species, *piceus* Walker (mon.). Refs. — Bigot, 1857b: 540; Williston, 1889: 256; Kertész, 1909: 161 (cat.); Carrera, 1949: 13; 1952: 81; Oldroyd, 1964a (rev.); Martin & Papavero, 1970: 56 (cat.).

*Ampyx* Walker, 1855: 564 (preocc. Dalman, 1827). Type-species, *varipennis* Walker (mon.) = *distendens* (Wiedemann). Ref. — Bigot, 1857b: 540. N. SYN.

*Doryclus* Jaennicke, 1867: 366. Type-species, *Asilus distendens* Wiedemann (orig. des.). Refs. — Wulp, 1870: 214; Lynch Arribálzaga, 1882: 185; Osten Sacken, 1887: 182; Roeder, 1887: 76; Williston, 1889: 256; 1891: 161 (cat.); Aldrich, 1905: 267 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 12; Curran, 1942: 55; Carrera, 1949: 8; 1953: 77; Martin & Papavero, 1970: 56 (cat.). N. SYN.

*Pseudodoryclus* Carrera, 1953: 61, 75. Type-species, *Megapoda rufiventris* Roeder (orig. des.). Ref. — Martin & Papavero, 1970: 57 (cat.). N. SYN.

Face approximately 1/3 total width of head, slightly prominent, strongly concave medianly, projected below into a short and thick lip; proboscis generally long and slender; palpus long and slender, with only 1 segment; antennae with third segment ovoid or discoidal; apical style entirely absent; mesonotum little convex to strongly convex anteriorly, projected into a strong gibba over the head; acrosticals absent; dorso-centrals reduced; scutellars absent; post-scutellar callosities with hairs; post-metacoxal area membranous, partially sclerotized, or with a com-

plete bridge of chitin; wings with marginal cell open or closed; 4th posterior and anal cells closed and petiolate; 1st posterior cell sometimes closed; in some species, a third submarginal cell is present; abdomen without "bullae"; male and female with 7 tergites; female terminalia formed by segment 8, triangular, elongate; male hypandrium short and wide, strongly concave, epandrium trapezoidal, dististylus with apical part falciform, gonopods fused basally through a wide bridge of chitin, slightly sclerotized.

Taxonomic discussion: Carrera (1952: 58) differentiated *Pseudorus*, *Doryclus* and *Pseudoryclus* by the following characters: species of the first genus would have the mesonotum produced anteriorly, so as to almost cover the entire head; the two other genera would have the pronotum more or less plane, differing between them by the fact that the species of *Doryclus* would have the posterior tibial apex and the posterior basitarsus strongly inflated and clavate, with a dense, bushy covering of hairs, while *Pseudoryclus* would have legs not clavate, with a short pilosity.

However, in 1964a Oldroyd described *Pseudorus dimidiatus*, with characters intermediate between *Pseudorus* and *Doryclus*, commenting (p. 5): "the hump, the swelling or otherwise of the hind tibiae and tarsi, and details of wing venation, are used in keys to separate three genera, but in fact all these characters are variable. Even the projection of the thorax is only in degrees more obvious in the species allocated to *Pseudorus* than in those placed in *Doryclus*. Moreover the new species *dimidiatus* is intermediate in convexity of the thorax and in swelling of the hind legs. It seems likely, in fact, that there is only one genus, which should take the name *Pseudorus*, since that is the oldest available name."

Oldroyd (l. c., p. 7, fig. 6) showed perfectly the gradation in development of the anterior mesonotum existing among the species of this genus; this character can be only used for specific differences, and not for genera. The legs are also very variable, and cannot be used for the establishment of genera. I therefore propose to synonymize all the 4 genera; the male genitalia corroborates this decision — in all species dissected it is remarkably uniform.

#### Key to species

1. Two submarginal cells; marginal cell always closed; 1st posterior cell open or closed; mesonotum little or moderately produced anteriorly, the gibba never surpassing level of head's occiput ..... 2
- Three submarginal cells; marginal cell open or closed; 1st posterior cell always open; mesonotum greatly produced anteriorly, the gibba reaching level of head's vertex or completely covering the head; wings brownish, with yellow spots; *piceus*-group 8

2. First posterior cell open ..... 3  
 First posterior cell closed; entirely dark-brown to blackish species; wings very dark-brown to blackish basally, hyaline on apical half; tibiae strongly arcuate and laterally flattened; 11-15 mm (Peru, Brazilian Amazonia, Venezuela) .... *dimidiatus* Oldroyd
3. Apex of posterior tibia and basitarsus not strongly inflated or hairy ..... 4  
 Apex of posterior tibia and basitarsus strongly inflated and densely covered by a brushy patch of hairs; entirely dark-brown to blackish species; wings dark or light-brown, with light-brown transverse spots; (Mexico to Argentina); *distendens*-group ...  
 ..... *distendens* (Wiedemann) and *mexicanus* (Bromley)
4. Fore basitarsus black or reddish-brown, of same color as tibia; wings either light brown with yellow spots, or black with or without light spots ..... 5  
 Fore basitarsus very long, longer than sum of four other tarsomeres, intensely light yellow, in strong contrast with the black anterior tibia; head and thorax black, abdomen reddish-brown; wings either uniformly yellowish, or light brown with lighter (almost hyaline) transverse spots; *rufiventris*-group ..... 7
5. Head, legs and abdomen blackish; antennae black; wings predominantly black with or without transverse light spots; head over twice as wide as high, the vertex deeply excavated, the head having a goggle-eyed appearance; *bicolor*-group ..... 6  
 Body more or less uniformly light reddish-brown; antennae orange; wings light brown, with lighter (yellowish) transverse spots; mesonotal gibbosity reaching level of head's occiput, black tomentose on top of hump (Brazil: São Paulo to Santa Catarina) ..... *dandrettae* Carrera
6. Wings uniformly black; thorax reddish, but sometimes anterior slope, and always the posterior slope of mesonotum, the whole mesopleura, and most of the hypopleura, black; mesonotum produced anteriorly, but not so humped as the species below; 15-20 mm (Mexico) ..... *bicolor* Bellardi  
 Wings black with a yellowish transverse spot on the third fourth of the wing; thorax reddish, mesopleura and hypopleura reddish; anterior portion of mesonotum blackish, produced, reaching level of head's occiput; 12 mm (Brazil: Santa Catarina) .....  
 ..... *holcocephalinus*, sp. n.
7. Apical four segments of fore tarsus black, in strong contrast with the light yellow basitarsus, which is longer than the sum of the following four tarsomeres; antennae dark reddish-brown,

grey pollinose; mesonotum, the extremely well-developed post-scutellum, metapleura, and sternite-1 densely covered by golden-yellow tomentum; coxae yellowish-brown; hind femora light reddish-brown; wings uniformly light yellowish; 16 mm (Peru, Brazil: Amazonas) ..... *rufiventris* (Roeder)

Apical four segments of fore tarsus yellowish, not contrasting with basitarsus, which is subequal to or slightly longer than the sum of the following four tarsomeres; antennae orange; tomentum very sparse on lateral margins of mesonotum and post-scutellum; greyish, mixed with brown pollinosity; metapleura and sternite-1 shining black; coxae shining black; hind femora yellowish-brown basally, black on apical half or more; wings light brown, with several light spots; abdomen dark reddish-brown, blackish basally; 16 mm (Mexico) ..... *martini*, sp. n.

8. Marginal cell largely open; mesonotum with extremely well-developed gibbosity anteriorly, surpassing and completely covering head; thorax shining black; anterior tibia laterally flattened; anterior basitarsus almost as long as its tibia; third fourth of wing with two yellow spots, one above, larger, the lower one smaller (Brazil: Santa Catarina) ..... *hermanni* Carrera

Marginal cell closed; mesonotum also strongly produced, but gibba only reaching level of head's vertex; thorax reddish, top of hump with two short stripes of black tomentum; anterior tibia long and slender, cylindrical, anterior basitarsus definitely shorter than its tibia; wing with elongate, proximal, dorsal spot, and another, larger, dorsal yellow spot on the third fourth (Brazil: Espírito Santo) ..... *piceus* Walker

### 1. *Pseudorus bicolor* Bellardi

*Pseudorus bicolor* Bellardi, 1861: 11, pl. 1, fig. 20 (whole insect). Type-locality: Mexico, Veracruz, Playa Vicente. Syntypes (2 ♀), TORO (n.º 92, Box 3) (examined in 1972). Refs. — Osten Sacken, 1887: 183; Williston, 1889: 256; 1901: 315; Aldrich, 1905: 267 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 14; Carrera, 1949: 15; 1950: 162.

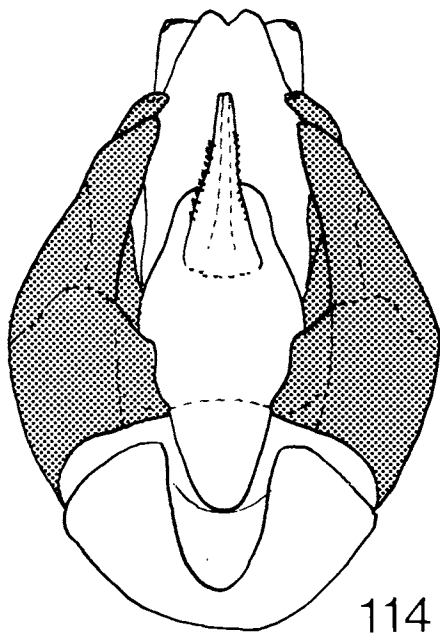
*Pseudoryclus bicolor*; Carrera, 1952: 76; Martin & Papavero, 1970: 57 (cat.).

Male genitalia as in Figs. 114-116.

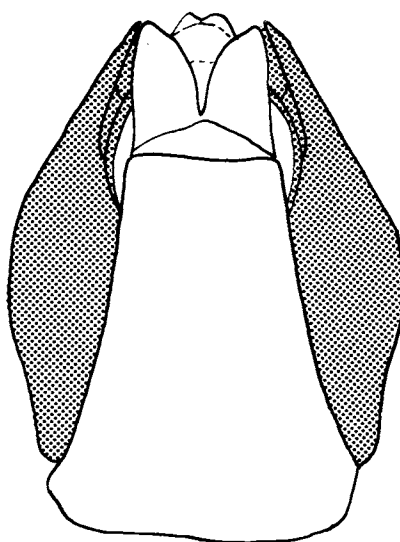
Material examined: MEXICO: *Nayarit*: vic. Compostela, vii.1933 (no collector), 1 ♂ (CHM), 1 ♂ (MZUSP); vi.1934, 1 ♂ (USNM); Té-



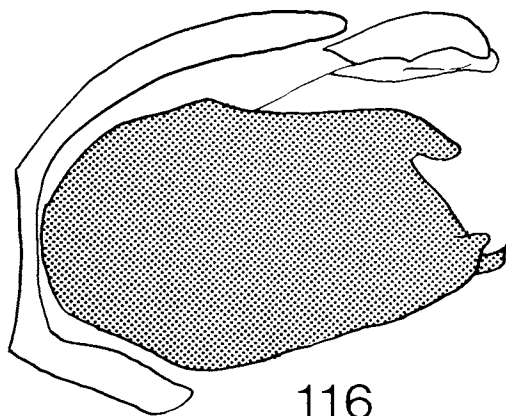
pic, ix.1957 (R. & K. Dreisbach), 1 ♀ (CHM); *Michoacán*: 10 mi. W. Apatzingán, ix.1960 (Martin), 3 ♀ (CHM; one specimen compared with Bellardi's syntypes), 2 ♀ (MZUSP); *Oaxaca*: Taparatepec, viii.1951 (no collector), 1 ♀ (LACM); 3 mi. W El Camarón, viii.1963 (Parker & Stange), 1 ♀ (CHM); *Guerrero*: Acapulco, ix.? (H. H. Smith), 1 ♂ (AM



114



115



116

*Pseudorus bicolor* Bellardi, male genitalia: 114, ventral; 115, dorsal; 116, lateral.

NH); Amula, 6000 ft, ix.? (H. H. Smith), 1 ♀, 2 ♂ (AMNH), 1 ♂ (USNM); *Jalisco*: Santiago Iscuintla, vi.? (Schumann), 1 ♀ (AMNH); *Veracruz*: Córdoba, viii.1962 (Michelbacher) (UCB); 20 mi. S Pánuco, viii.1959 (Stange & Mencke), 1 ♀ (USNM); *Yucatán*: Pisté, viii.1968 (Welling), 2 ♂ (CHM), 1 ♂ (MZUSP). COSTA RICA: La Suiza de Turrialba (Schild), 1 ♀ (USNM).

Osten Sacken (1887) also cites this species for Guatemala (San Gerónimo).

## 2. *Pseudorus dandrettiae* Carrera

*Pseudorus dandrettiae* Carrera, 1949: 15. Type-locality: Brazil, São Paulo, Itaporanga. Type, MZUSP. Refs. — Carrera, 1952: 82; Oldroyd, 1964a: 5 (key), 10 (descr.), figs. 3 (wing), 6.3 (convexity of mesonotum) (misident. — see under *holcocephalinus*, sp. n.); Martin & Papavero, 1970: 56 (cat.).

This species was not dissected, as I had no males in the MZUSP collection.

Material examined: BRAZIL: *São Paulo*: Itaporanga (Núcleo Barrão de Antonina), i.1946 (Barretto), 4 ♀; *Guanabara*: Represa Rio Grande, x.1963 (Oliveira), 1 ♀; *Paraná*: Rondon, xii.1952 (Plaumann), 1 ♀; *Santa Catarina*: Nova Teutônia, xi.1948, xi.1957 (MZUSP); xii.1941, ♂, xii.1940, ♀ (AMNH); ii.1940, xii.1940, i.1941, xii.1941, 2 ♀, 4 ♂ (USNM) (Plaumann).

## 3. *Pseudorus dimidiatus* Oldroyd

*Pseudorus dimidiatus* Oldroyd, 1964a: 5 (key; as *dimidiata*, lapsus), 9 (descr.), figs. 1 (hind tibia), 2 (wing), 6.3 (mesonotal gibba). Type-locality: Brazil, Amazonas. Type ♀, BMNH (examined in 1972). Ref. — Martin & Papavero, 1970: 56 (cat.).

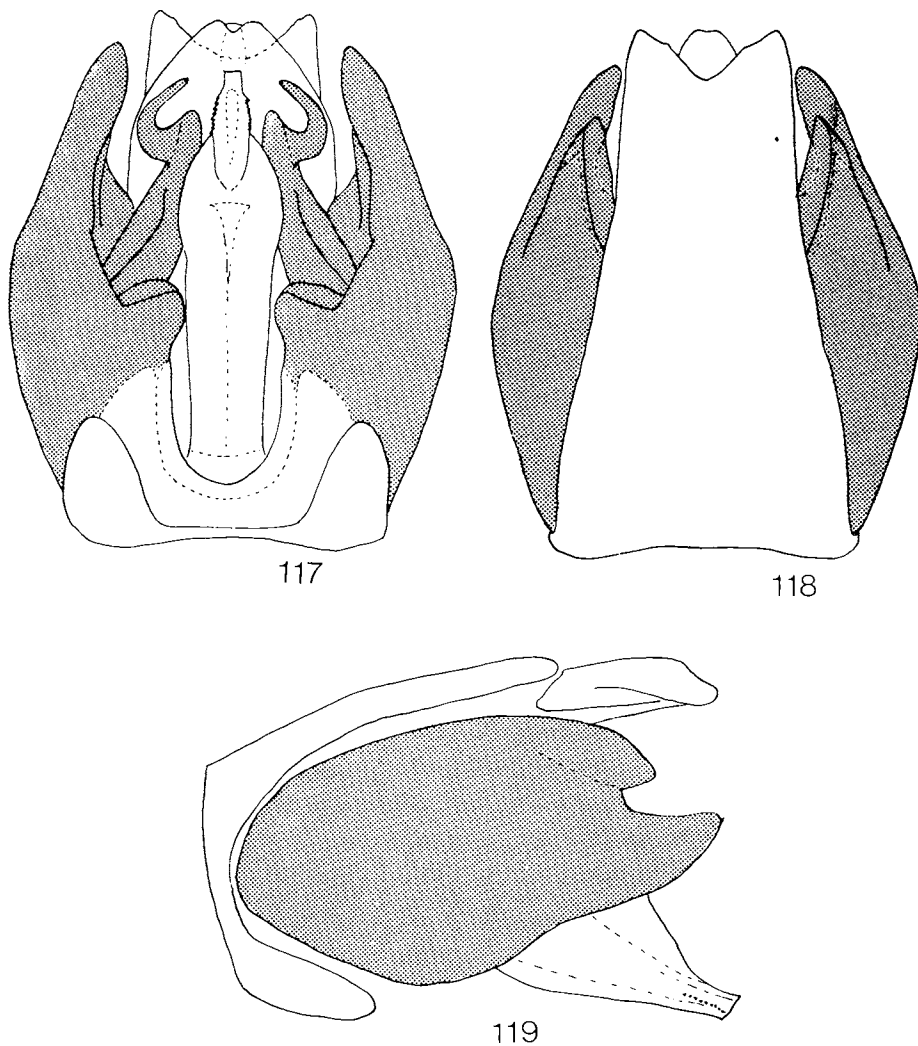
This species is only known from female specimens. Oldroyd's type was captured by Bates in the Amazons, and has no more precise locality.

Material examined: PERU: (EF). BRAZIL: *Amazonas*: Tabatinga, ii.1957 (Lima), ♀ (MZUSP); Tefé, xii.1961 (Oliveira), 1 ♀ (MZUSP); *Pará*: Santarém, no other data, 1 specimen lacking tip of abdomen (AMNH). VENEZUELA: Caura Valley, no other data, 1 ♀ (USNM).

4. *Pseudorus distendens* (Wiedemann), *N. comb.*

*Asilus distendens* Wiedemann, 1938: 571. Type-locality: "Brazil". Type, FRAN (examined in 1972). Ref. — Schiner, 1866: 690.

*Megapoda crassitarsis* Macquart, 1846: 198 (1846: 70), pl. 7, figs. 11, 11a (whole insect, head). Type-locality: "Brazil". Type lost (I was not able to locate it at the MNHN, in 1970, 1972).



*Pseudorus distendens* (Wiedemann), male genitalia: 117, ventral; 118, dorsal; 119, lateral.

- Megapoda cyaneiventris* Macquart, 1846: 199 (1846: 71), pl. 7, fig. 12 (abdomen). Type-locality: "Mexico". Type, MNHN (examined 1970). Ref. — Carrera, 1952: 78.
- Ampyx varipennis* Walker, 1855: 564. Type-locality: Brazil, Pará, Santarém. Type ♀, BMNH (examined in 1970).
- Doryclus distendens*; Jaennicke, 1867: 366; pl. 44, fig. 3 (whole insect); Roeder, 1887: 76; Williston, 1889: 256; 1891: 77 (cat.); Aldrich, 1905: 268 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 12; Carrera, 1942: 56; 1949: 9, 1952: 80 (places *cyaneiventris*, *varipennis*, *latipes*, *guentherii*, and *panamensis*, in synonymy of *distendens*); Martin & Papavero, 1970: 56 (cat.).
- Doryclus latipes* Wulp, 1870: 216, pl. 9, figs. 7-12 (whole insect, head, legs, wing). Type-locality: "Surinam". Type, ZMA (examined in 1972). Refs. — Curran, 1942: 56; Martin & Papavero, 1970: 56 (cat.).
- Doryclus guentherii* Lynch Arribálzaga, 1882: 186. Type-locality: Argentina, Buenos Aires. Type, Museo Bernardino Rivadavia, Buenos Aires (?lost). Refs. — Hermann, 1912: 12; Carrera, 1949: 13; Martin & Papavero, 1970: 56 (cat.).
- Doryclus varipennis*; Osten Sacken, 1887: 182; Curran, 1942: 56; Carrera, 1949: 11.
- Megapoda guentherii*; Williston, 1891: 77; Kertész, 1909: 161 (cat.).
- Doryclus crassitarsis*; Kertész, 1909: 162 (cat.); Curran, 1942: 56; Carrera, 1949: 10; 1952: 81; Martin & Papavero, 1970: 56 (cat.).
- Doryclus panamensis* Curran, 1942: 56. Type-locality: Panama, Canal Zone, Corozal. Type, AMNH (examined in 1968). Ref. — Martin & Papavero, 1970: 56 (cat.).
- Doryclus carrerai* Bromley, 1951: 18. Type-locality: Brazil, Santa Catarina, Nova Teutônia. Type, AMNH (examined in 1968). Ref. — Martin & Papavero, 1970: 56 (cat.). N. SYN.
- Doryclus plaumanni* Bromley, 1951: 18. Type-locality: Brazil, Santa Catarina, Nova Teutônia. Type, AMNH (examined in 1968). N. SYN.

This extremely difficult group, highly variable in color and size, has always baffled the dipterists. Bromley (1951) published an absolutely impracticable key to the "species", mostly based on individual variations. Carrera (1952) considered only two species, *distendens* and *crassitarsis*. The male genitalia (Figs. 117-119) of several specimens dissected was identical; more material will be needed, especially from outside the Guiano-Brazilian subregion, to decide how many species (if more than one) exist in the Neotropical Region. I am here considering, provisionally, only two species in this group — *distendens* and *mexicanus*; the first seems to be an exclusively forest-dwelling species (see Map); *mexi-*

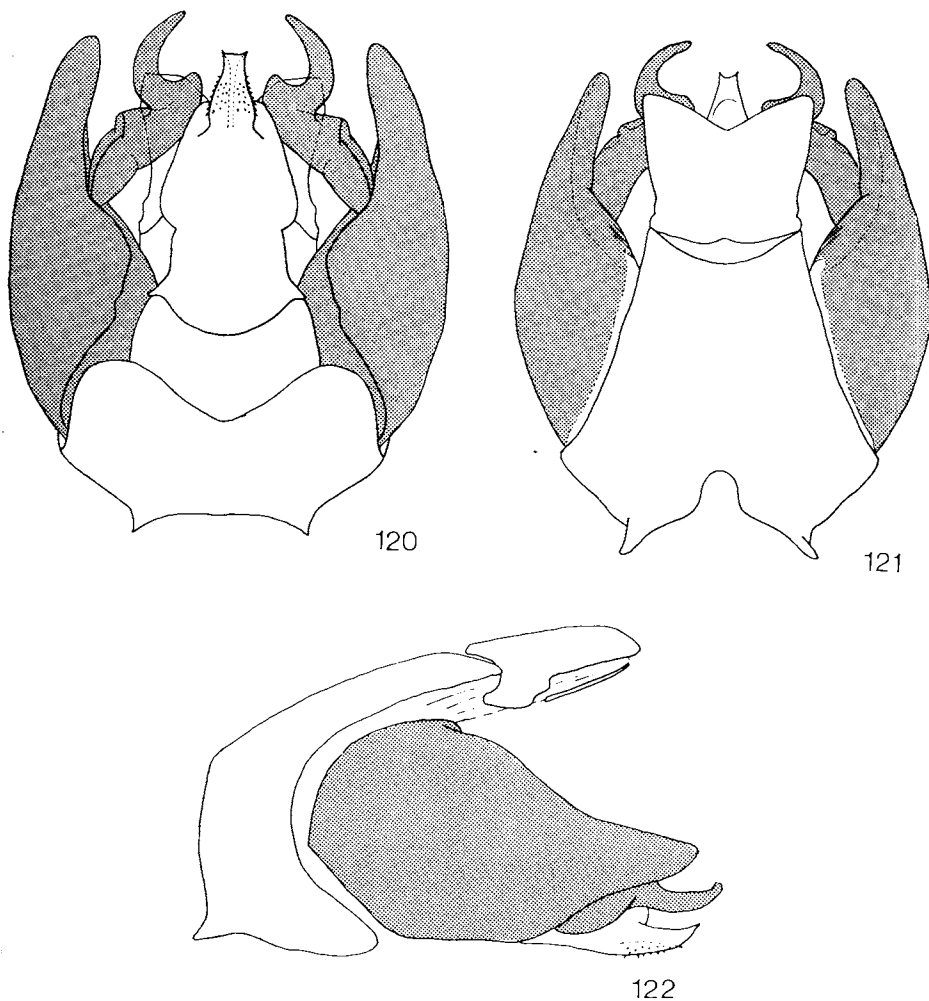
*canus* Bromley is here considered a species because it inhabits the Sonoran Desert; however, it cannot be adequately separated morphologically from *distendens*.

Material examined: MEXICO: Tehuantepec, no date (Sumichrast), 1 ♂ (USNM); 8 mi. N Sinaloa, Mazatlán, viii.1960 (Westcott), 1 ♂ (LACM); Colima: 9 mi. SW Manzanillo, viii.1962 (R. H. & E. M. Painter), 1 ♂ (CHM); Veracruz: 21 mi. SW Pánuco, viii.1964 (Fisher & Verity), 1 ♀ (CHM); Baja California: San José del Cabo, no date (Townsend), 1 ♀ (USNM). COSTA RICA: San Mateo, Higuito, no date (Schild), 1 ♀ (USNM). GUATEMALA: El Reposo (cited by Osten Sacken, 1887: 182). PANAMA: Canal Zone, Ancon, iv.1926 (Greene), 1 ♂ (USNM); Canal Zone, Summit, no date (Zetek), with note: "emerged May-June 1930; on *Triplaris americana*", 3 ♂, 4 ♀ (USNM); Red Tank, iv.1923 (Shannon), 1 ♂ (USNM); Parita, no date, no. 1689 — 4 puparia, 2 with semi-emerged fly (USNM); Summit, 2 puparia, no. Z-3224, associated with 5 adults (USNM); Parita, iv.1922 (Zetek), with note: "in cerambycid borer holes in orange tree", 1 ♀ (USNM); Parita (Zetek), with note "bred from orange trunk", 1 ♀ (USNM); Parita (Zetek), 2 ♂, 3 ♀ (USNM); VENEZUELA: no other data, 1 ♂ (USNM). SURINAM: Paramaribo, Botanical Garden, v.1941 (Geijskes), 1 ♀ (AMNH). GUYANA: Potaro, v.1910 (no collector), 1 ♀ (USNM). PERU: 10 km S Chiclayo, iii.1951 (Ross & Michelbacher), 1 ♀ (CAS). ECUADOR: Guayaquil, no date (Campos), 1 ♀ (USNM). BRAZIL: Amazonas: Benjamin Constant, Rio Javari, iii.1942 (Rabault) (AMNH); Pará: Óbidos, vii.1956 (Oliveira), 1 ♂ (MZUSP); Mato Grosso: Barra do Tapirapés, xii.1964 (Malkin), 1 ♀ (MZUSP); Salobra, iii.1940 (Com. Inst. Oswaldo Cruz), 1 ♀ (MZUSP); Porto Primavera, Rio Paraná, x.1954 (Lane), 1 ♂ (MZUSP); Chapada (dos Guimarães), no date (H. H. Smith), 1 ♂, 1 ♀ (AMNH); Espírito Santo: Córrego do Itá, xi-xii.1956 (Zikán), 1 ♂, 1 ♀ (MZUSP); Parque Sooretama, Linhares, xi-xii.1962 (Oliveira), 2 ♀; São Paulo: Porto Cabral, Rio Paraná, iii-iv.1944 (Travassos F.), 2 ♀ (MZUSP); Atibaia, ii.1947 (Navajas), 1 ♀ (MZUSP); Sorocaba, iii.1948 (Bokermann), 1 ♀ (MZUSP); Itaporanga (Núcleo Barão de Antonina), i.1946 (Barretto), 3 ♂, 25 ♀ (MZUSP), 1 ♀ (USNM); Paraná: Rolândia, iii.1948 (Maller) (AMNH); Santa Catarina: Nova Teutônia, xii.1941, ii.1941, ii.1937, xii.1941 (paratypes of *plaumanni*), x.1941, i.1941 (*plaumanni*), ii.1942 (AMNH); iii.1968, xi.1968, xii.1968, 4 ♂, 3 ♀ (CHM); xii.1941, xii.1940, i.1942, i-ii.1942, 7 ♂, 8 ♀ (USNM); several dates (Plaumann), 14 ♂, 12 ♀ (MZUSP); Rio Grande do Sul: Santa Cruz, no date (Stigmayer), 1 ♀ (USNM). PARAGUAY: Molinasué, x.1939 (Schade), 1 ♀ (USNM); Sapucay, no other data, 1 ♀ (USNM); Colonia Independencia, Caazapá, xii.1951 (Foerster), 1 ♂, 2 ♀ (MZUSP). ARGENTINA: Misiones: Iguazú, ii-iii.1945 (Hayward, Willink & Golbach), 1 ♀ (MZUSP); Tucumán: Ciudad, ii.1953 (Hayward), 1 ♀ (MZUSP).

5. *Pseudorus hermanni* Carrera

*Pseudorus piceus* Walker of Schiner, 1866: 703, and of Hermann, 1912: 13, fig. 5 (misident.).

*Pseudorus hermanni* Carrera, 1949: 14. Type-locality: unknown. Lectotype, WIEN (selected by Oldroyd, 1954a: 9). Refs. — Carrera, 1952: 61; Oldroyd, 1954a: 8 (descr.), figs. 4 (wing), 6.1 (mesonotal gibbosity); Martin & Papavero, 1970: 56 (Cat.).



*Pseudorus hermanni* Carrera, male genitalia: 120, ventral; 121, dorsal; 122, lateral.

Material examined: BRAZIL: *Santa Catarina*, Nova Teutônia, i. 1963 (Plaumann), 1 ♂ (MZUSP). Oldroyd (1954a: 9) cited a specimen from Pucallpa, Peru, in the BMNH, which may be a new species.

#### 6. *Pseudorus holcocephalinus*, sp. n.

♀ body length: 12 mm; wing length: 11 mm.

Head over twice as wide as high (width measured at level of epistomal margin); vertex strongly concave, the eyes and the ocellar callosity strongly bulging, giving a goggle-eyed appearance to the head, reminding a *Holcocephala* (Asilidae, Trigonimiminae); face short, moderately concave, the epistomal margin developed into a moderately long beak; occiput, frons, ocellar callosity, face, basal two segments of antenna, palpus, proboscis and epistomal margin shining black; lateral margins of face with dark brown pollinosity on the upper part, and sericeous-white tomentum on the lower one; pilosity of occiput, ocellar triangle, and antennae, black; the long hairs of the base of the palpus yellowish-white; proboscis long, surpassing apex of antennae.

Thorax: pronotum shining black, with diffuse, reddish areas; pilosity black; mesonotum moderately produced forward, forming a gibbosity that reaches the level of the occiput, shining reddish anteriorly under the gibbosity, black on top of the hump and lateroanteriorly; the dark stripes of mesonotum thus arranged: one median, extending little beyond transverse suture; two dorsocentral, accompanying the reduced rows of dorsocentral bristles, and two lateral stripes; the latter four stripes reaching almost the scutellar level; scutellum shining, red, with black margin; pleura shining red, mesopleura and hypopleura black; metapleura with pencil of small short bristles, fulvous; post-scutellar callosities with black hairs; post-scutellum shining black, with reddish reflexes according to incidence of light.

Wings entirely dark-brown to black, especially on the basal 3/5; then with a transverse yellow spot, from the beginning of the discal cell to the bifurcation of  $R_{4+5}$ ; wing apex slightly lighter than the dark basal part; squama reduced, black; halteres shining black.

Legs: coxae reddish or ferruginous, except for the hind coxae, which are black; legs entirely shining black, sometimes posterior tibia ferruginous-red, with apical third shining black; hairs and bristles short; pulvilli yellowish-brown, claws black.

Abdomen entirely black, with some diffuse, reddish-brown areas on lateral margins of tergites 1-2, sometimes also in the narrow posterior margin of the 3 apical tergites; ovipositor shining black, with yellowish pilosity; pilosity of abdomen escarce and black.

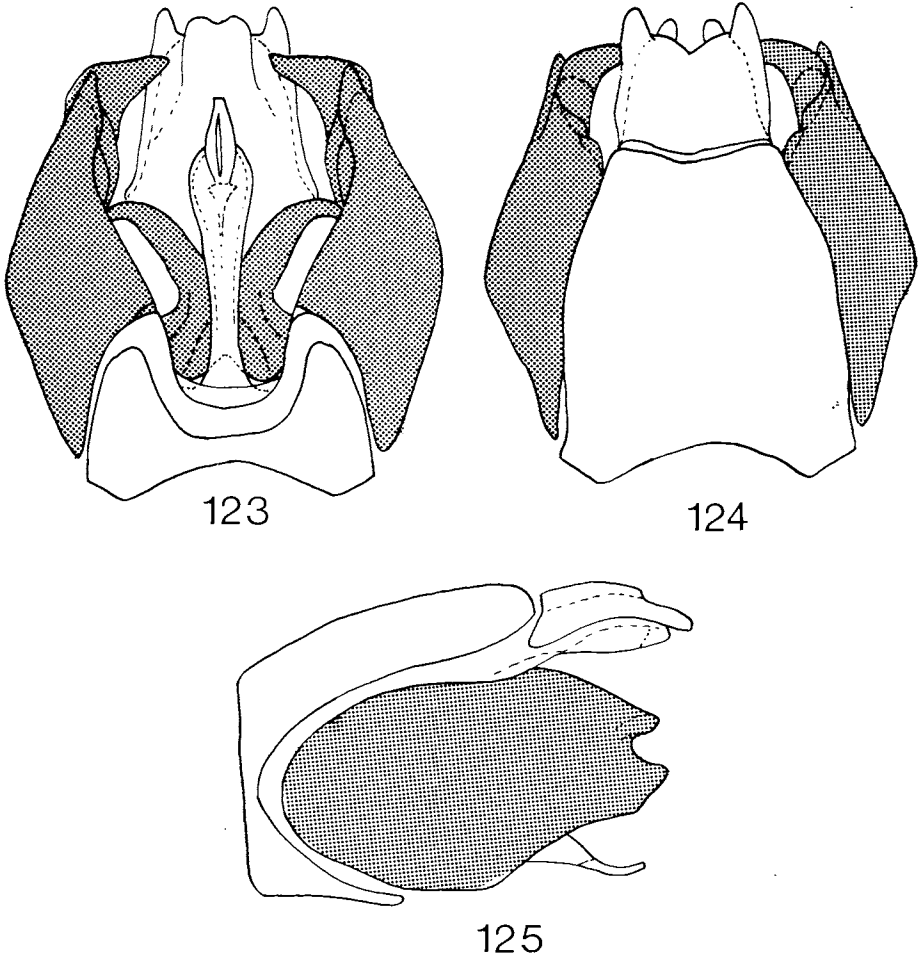
Male: unknown.

Holotype ♀, BRAZIL: *Santa Catarina*: Nova Teutônia, xii.1960 (Plaumann), in MZUSP. Paratypes: 2 ♀, same locality, i.1971 (MZUSP), 1 ♀, i.1969 (CHM), 1 ♀, ii.1939 (BMNH).

7. *Pseudorus martini*, sp. n.

♂ — body length, 16 mm; wing length, 13 mm.

Head: Frons black, with black hairs, moderately concave; ocellar callosity prominent, ocelli yellowish; antennae orange, the basal two segments with black bristles; face orange-brown, with golden tomentum laterally and black spots laterally to the epistomal margin; subepistomal area reddish-brown; proboscis long and slender, brown, twice the height of an eye; palpi brown, long and slender, half the length of proboscis, with black hairs.



*Pseudorus martini*, sp. n., male genitalia: 123, ventral; 124, dorsal; 125, lateral.



Thorax shining black, reddish-brown on humeri and postalar calli; pilosity very reduced, present only on mesonotum and postalar calli, and black; metapleura with yellowish-brown pencil of small bristles; mesonotum with 3 light-brown pollinose stripes: one, median, longitudinally divided and ending near the scutellum; the lateral stripes start at the level of the notopleura, are interrupted by the transverse suture, and end in front of the scutellum; these stripes are more or less visible according to incidence of light; post-scutellar callosities with black hairs.

Wings brownish, especially along veins, leaving hyaline areas in the interior of the cells, except the 1st posterior cell, which is entirely brownish; a transverse spot, much lighter, exists between r-m and the bifurcation of  $R_{4+5}$ ; squama yellowish-brown; halteres ochre-yellow.

Legs: coxae shining black, with black pilosity; femora dark orange, the hind femora with reddish apical half, and blackened dorsum; anterior tibia black, shining, the apex orange or reddish; median tibia orange; posterior tibia as the fore pair; anterior and median tarsi yellowish, the distal articles darkened, the 2 apical almost black; posterior tarsi orange or reddish, as the tibia; bristles black; the dense and short pilosity of the interior face of the anterior and posterior tibiae yellowish; pulvilli yellowish; claws black, with reddish base.

Abdomen: tergites 1 and 2, and anterior margin of 3, shining black; remaining tergites reddish-brown, with diffuse black spots; pilosity orange; genitalia (Figs. 123-125) orange-brown, shining, with black spots; genitalic hairs orange; abdominal venter as the dorsum.

♀ — similar to the male, but sometimes tergite 3 darker and shining.

Holotype ♂, MEXICO, *Puebla*: S of Matamoros, ix.1960 (Martin), in the MZUSP. Paratypes: *Morelos*: Cuernavaca, Hy. 136, km 22, x.1960 (Martin), 3 ♀, 1 ♂; do., 4400 ft, viii.1959 (R. H. & E. M. Painter), 2 ♀, 1 ♂; 18 mi. SW Cuautla, near N Temilpa, ix.1967 (R. H. & E. M. Painter), 4 ♂, 2 ♀ (one pair on same pin); 10 mi. SW Cuautla, x.1968 (R. H. Painter & E. M. Painter), 1 ♂; *Puebla*: 3 mi. N Petalcingo, viii.1963 (Parker & Stange), 1 ♀, in MZUSP and CHM.

This species is dedicated to Prof. Charles H. Martin.

#### 8. *Pseudorus mexicanus* (Bromley), *N. comb.*

*Dorychus mexicanus* Bromley, 1951: 17-18. Type-locality: Mexico, Sonora, Agua Prieta, Type ♂, USNM (seen).

As already told, this species is here considered as valid only because it inhabits the Sonoran Desert, whereas the *distendens*-group seems to be associated to the forests of the Neotropical region. It cannot, at present, be distinguished from *distendens*.

9. **Pseudorus piceus** Walker

*Pseudorus piceus* Walker, 1851: 103, pl. 4, fig. 5 (whole insect). Type-locality: "South America". Type ♀, BMNH (examined in 1970, 1972). Refs. — Walker, 1854: 493; Williston, 1889: 256; 1891: 77 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 13; Carrera, 1949: 15; Oldroyd, 1964a: 7 (descr.), figs. 5 (wing), 6.2 (mesonotal gibbosity); Martin & Papavero, 1970: 57 (cat.).

Oldroyd (1964a) redescribed the type; this species is only known from female specimens.

Material examined: BRAZIL: *Espírito Santo*: Parque Sooretama, Linhares, x-xi.1962 (Oliveira), 2 ♀ (MZUSP). One specimen from São Paulo in collection EF.

10. **Pseudorus rufiventris** (Roeder), *N. comb.*

*Megapoda rufiventris* Roeder, 1887: 78. Type-locality: Brazil, Amazonas, Maués. Type, ?. Refs. — Williston, 1891: 77 (cat.); Kertész, 1909: 161 (cat.); Hermann, 1912: 18.

*Pseudorychilus rufiventris*; Carrera, 1952: 75; Martin & Papavero, 1970: 57.

Material examined: PERU: *Huancayo*: Satipo, xi.1941 (Paprzycki), 1 ♀ (MZUSP); Bella Vista, San Martin, xii.1946, 1500 ft (Pallister), 1 ♂ (AMNH).

## 5.5. SUBTRIBE SENOBASIINA, NEW

Genus **Senobasis** Macquart

*Senobasis* Macquart, 1838: 52 (1839: 168). Type-species,  *analis* Macquart (Bromley, 1934: 332). Refs. — Walker, 1849: 343; 1854: 432, 500; Bigot, 1857b; Williston, 1891: 74 (cat.); Kertész, 1909: 123 (cat.); Curran, 1934c: 332; Carrera, 1946: 121; 1949: 16 (rev., keys); Bromley, 1951b: 12; Carrera, 1952: 64 (key); 1953: 64; 1960: 157; Carrera & Vulcano, 1961: 69-70 (preys); Carrera & Machado-Allison, 1963: 239; Hull, 1962: 421, figs. 28 (distribution), 245 (antenna), 675 (wing), 1276 (head), 1286 (head), 2107 (male genitalia), 2131 (female terminalia), 2165 (female terminalia); Martin & Papavero, 1970: 57 (cat.).

*Stenobasis* Agassiz, 1846: 338 (emend.).

*Astylidium* Rondani, 1850: 185. Type-species,  *claviger* Rondani (orig. des.). Refs. — Osten Sacken, 1891: 417; Kertész, 1909: 83 (cat.).

*Lochites* Schiner, 1866: 655 (key), 671 (1868: 163; second erection of genus; preocc. Cabanis & Heine, 1860). Type-species,  *Laphria ornata* Wiedemann (orig. des.). Ref. — Kertész, 1909: 124 (cat.).

*Lochitomyia* Brèthes, 1925: 105 (nom. nov. for *Lochites* Schiner). Type-species, *Laphria ornata* Wiedemann (aut.).

Slender, relatively large or medium sized flies (10-25 mm); face narrow, 1/5 of head's width, short above, becoming gradually more protruded below, in some species forming a beak or nose on the epistomal margin; proboscis long; palpi elongate, subsigmoid, with only 1 segment, in some species basal segment still vestigial; 3rd antennal segment strongly attenuate at base, clavate in several species, without apical style, only with an apical pit with a more or less hidden spine; mesonotum slightly convex, almost plane; acrosticals absent; dorsocentrals present, but reduced; scutellars absent; post-scutellar callosities only micropubescent; some species with hairs *under* the callosities; post-metacoxal area membranous; wings: marginal cell open; 4th posterior and anal cells closed and petiolate; legs long and slender; first abdominal tergites without "bullae" on posterior margin; males with 7, females with 8 tergites; female terminalia in the shape of a triangular plate, formed by segment 9, without spines; male genitalia completely rotate, variable in shape (see above, Characters of the Megapodini).

Taxonomic discussion: The misidentification of the genera *Senobasis*, *Lochites* and *Blepharepium* (see discussion in Papavero & Bernardi, 1973) brought some confusion to the literature; several authors attributed to *Senobasis* species that belonged to entirely different genera (and tribes). Hull (1962: 422) and Martin & Papavero (1970: 57) listed the following species under *Senobasis*:

1. *almeidai* Carrera; 2.  *analis* Macquart; 3. *annulata* Bigot; 4. *apicalis* (Schiner); 5. *asiloides* (Bigot); 6. *boraceana* Carrera; 7. *bromleyana* Carrera; 8. *claripennis* (Schiner); 9. *clavigera* (Rondani); 10. *corsair* Bromley; 11. *flukeyi* Carrera; 12. *frosti* Bromley; 13. *fulva* (Bigot); 14. *gyrophora* (Schiner); 15. *lanei* Carrera; 16. *lopesi* Carrera; 17. *mendax* Curran; 18. *modesta* Bigot; 19. *mundata* (Wiedemann); 20. *nigriventris* (Bigot); 21. *ornata* (Wiedemann); 22. *rhombungulata* Carrera; 23. *staurophora* (Schiner); 24. *tibialis* Curran; 25. *weyrauchi* Carrera.

The study of types revealed the following:

1. *Lochites asiloides* Bigot, 1878, placed by Hull (1962: 233) in *Blepharepium*, and by Martin & Papavero (1970: 57) in *Senobasis*, is actually a synonym of *Alloponogon necans* (Wiedemann, 1828) (Papavero, 1971a: 20);
2. *Senobasis annulata* Bigot, 1857 is a valid species of *Blepharepium* (cf. Papavero & Bernardi, 1973);
3. *Dasypogon fulvus* Bigot, 1878, placed by Hull (1962: 233) in *Blepharepium*, and by Martin & Papavero (1970: 58) in *Senobasis*, is a synonym of *Diogmites castaneus* (Macquart, 1838) (Papavero, 1971a: 20).
4. *Senobasis modesta* Bigot, 1878, placed by Hull (1962: 233) in *Blepharepium*, belongs in fact to that genus, and was synonymized with *B. luridum* Rondani, 1848, by Papavero & Bernardi (1973).

5. *Lochites nigriventris* Bigot, 1878, was transferred to *Deromyia* Philippi by Artigas (1970: 116).

6. The fossil from Florissant, Colorado, described by James as "*Senobasis borealis*" is in fact probably better placed in *Blepharepium* (see Papavero & Bernardi, 1973);

7. *Laphria ornata* Wiedemann is the same as *Senobasis rhombungulata* Carrera, and, of course, has priority; *Dasypogon aedon* Walker also has priority over *Lochites staurophora* Schiner.

The present arrangement of the species of *Senobasis*, based on the study of types and dissection of the male genitalia, is as follows:

1. *aedon* (Walker) (= *staurophora* Schiner); 2.  *analis* Macquart (= *tibialis* Curran); 3. *apicalis* (Schiner) (= *lopesi* Carrera); 4. *bromleyana* Carrera; 5. *claripennis* (Schiner); 6. *clavigera* (Rondani); 7. *clavigeroides*, sp. n.; 8. *corsair* Bromley; 9. *flukeyi* Carrera; 10. *frosti* Bromley; 11. *gyrophora* (Schiner); 12. *lanei* Carrera (= *boraceana* Carrera); 13. *lenkoi*, sp. n.; 14. *mendax* Curran; 15. *mundata* (Wiedemann); (= *rhombungulata* Carrera); 17. *notata* (Bigot) (= *weyrauchi* Carrera). *Senobasis almeidai* Carrera, described on the basis of a single female, is probably a color variation, but its situation cannot be cleared at present; it is here left "incertae sedis".

#### Key to species

1. Third antennal segment normally light yellow or yellowish-red; basal two segments of antenna normally yellow; if antennae brown (or very dark brown, sometimes), then either abdomen yellow, tergites 2-5 with a broad triangular black spot (*lanei*), or face not produced on epistomal margin in the shape of a nose or beak (*claripennis* and *apicalis*) ..... 2
  - Third antennal segment black; if sometimes brownish or red-brown (*ornata*), then claws obtuse at apex ..... 7
2. Tergites yellowish, with several types of black spots, but these never quadrangular; male genitalia: hypandrium short, not projected between gonopods in the shape of a tongue, and apical process of basistylus relatively short and undeveloped; *gyrophora*-group (Guiano-Brazilian subregion) ..... 3
  - Tergites yellowish, with a more or less broad quadrangular black spot, occupying almost all the surface of tergites; abdomen generally very slender; male genitalia: hypandrium either short or tongue-like and produced between gonopods; apical process of basistylus relatively short, the gonopod, as seen in lateral view, broadly oval; *claripennis*-group (Southeastern and southern Brazil) ..... 6

3. Antennae entirely yellow; abdominal tergites yellow, with different types of black spots, but these never in the shape of a broad triangle ..... 4
- Basal two antennal segments blackish; 3rd antennal segment reddish-yellow or reddish-brown (sometimes very dark); abdominal tergites yellowish-green, with a large, roughly triangular black spot occupying the central portion of tergites; wings yellowish; 15-17 mm (Brazil: Minas Gerais, Rio de Janeiro, São Paulo) ..... *lanei* Carrera
4. Tergites 2-5 with two separate, triangular, relatively large, black spots on sides (see Carrera, 1952: 71, fig. 8); 15-22 mm; (Brazil: Rio de Janeiro, São Paulo, Santa Catarina) ..... *mundata* (Wiedemann)
- Black spots on tergites never as above ..... 5
5. Tergites 2-5 each with a black, horseshoe-shaped black spot; apical tergites blackish (see Carrera, 1952: 71, fig. 10); black lateral spots of mesonotum covered by greenish-yellow pollen; 15-18 mm; (Brazil: Rio de Janeiro to Santa Catarina) ..... *gyrophora* (Schiner)
- Tergites 2-5 each with two separate, rounded spots on anterior margin; those spots may become fused basally, on all tergites (see Carrera, 1952: 71, fig. 9); 15-20 mm; (Amazonia, from Ecuador to Pará) ..... *notata* (Bigot)
6. Tergites, in males, with a very large black quadrangular spot, leaving only a very narrow yellow posterior margin; dististylus with two long, diametrically opposed processes apically (Fig. 140); in females tergites almost entirely black, sometimes with narrow hind margin; lateral margins brown, brownish pollinose; 13-20 mm; (Brazil: Minas Gerais, Guanabara, Rio de Janeiro, São Paulo) ..... *apicalis* (Schiner)
- Tergites, in males, with smaller quadrangular spot, leaving a wider posterior margin; dististylus elongate, simple (Fig. 143); female tergites with narrow yellow hind margin, lateral margins yellow, yellow pollinose; 11-20 mm; (Brazil: Minas Gerais, east to Rio de Janeiro, south to Santa Catarina) ..... *claripennis* (Schiner)
7. Black lateral spots of mesonotum undivided (Fig. 125); hypandrium produced between gonopods, tongue-like; apical process of basistylus long and slender (Guiano-Brazilian subregion);  *analis*-group ..... 8
- Black lateral spots of mesonotum clearly bisected by line of grey or yellow-grey pollinosity accompanying transverse suture (Fig. 126); hypandrium produced between gonopods, tongue-like;

- apical process of basistylus long, large, spatulate at apex, as seen in lateral view; (Northwestern Arch of South America); *clavigera*-group ..... 13
8. Abdomen predominantly black ..... 9  
 Abdominal tergites 2-4 definitely reddish-yellow; apical tergites normally black, with blue lustre; 13-18 mm; Amazonia (from Peru to French Guiana and Amapá) .....  *analis* Macquart
9. Tergites entirely black, 2-5 entirely grey pollinose, or at least with lateral margins grey pollinose; face not or very little produced at epistomal margin ..... 10  
 Tergites black, but with broad yellow hind margin; face strongly produced below, on epistomal margin, into a beak or nose .. 12
10. Claws acute ..... 11  
 Claws obtuse; 22 mm; (Brazil: Espírito Santo, Rio de Janeiro) ...  
 .....  *ornata* (Wiedemann)
11. Face dark chocolate-brown; wings dark brown microvillose, at least at apex; legs black; large species, 18-22 mm; (Panama to coastal Colombia: Chocó) .....  *corsair* Bromley  
 Face yellow-golden tomentose; wings light brown microvillose; legs with tibiae dark reddish-brown; smaller species, 9-15 mm; (Amazonia: from Ecuador to the Guianas) ...  *mendax* Curran
12. Male genitalia as in Figs. 134-136; 12-17 mm; (Brazil: Minas Gerais, São Paulo) .....  *bromleyana* Carrera  
 Male genitalia as in Figs. 137-139; (Brazil: Mato Grosso) .....  
 .....  *lenkoi*, sp. n.
13. Abdomen clearly covered by thick yellow pollinosity, at least from tergite 2 to 5 ..... 14  
 Abdomen either covered by thick grey pollen on tergites 2-5 (males), or black, with lateral margins of tergites grey pollinose (females) ..... 16
14. Basal two segments of antenna yellowish; face and frons silvery-grey tomentose; 20 mm; (Venezuela) ....  *clavigera* (Rondani)  
 Antenna entirely black; face and frons yellow or ochre-yellow tomentose ..... 15
15. Legs entirely yellow, only "knees" brownish-black; tergites 1-5 with a well-defined black sagitate spot on the middle; 21-23 mm; (Panama) .....  *frosti* Bromley  
 At least dorsum of fore and middle femora black; apical two tergites black; 18-20 mm; (Ecuador) .....  *clavigeroides*, sp. n.

16. Male genitalia and female terminalia reddish-yellow; 14-20 mm; (Ecuador) ..... *flukei* Carrera
- Male genitalia and female terminalia black; 18-21 mm; (Venezuela, Colombia) ..... *aedon* (Walker)

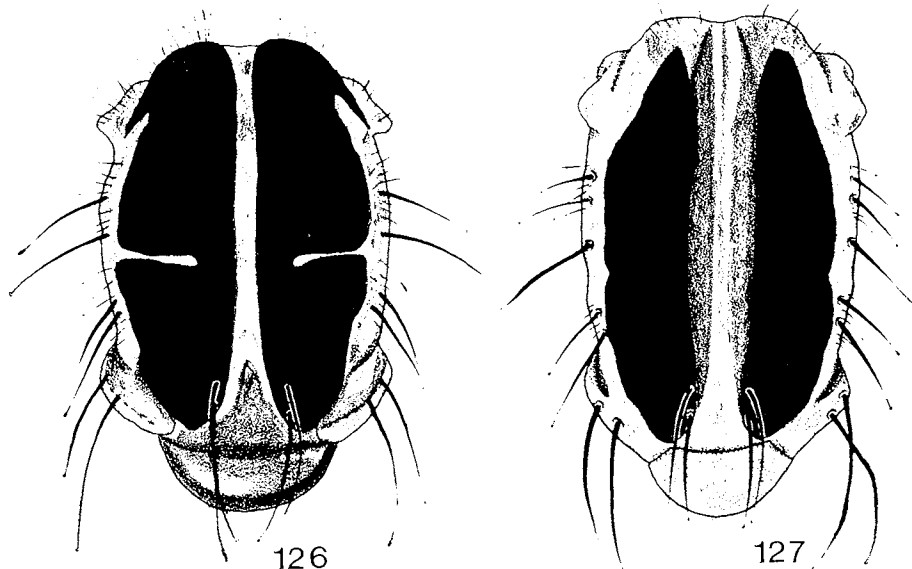
This key is still tentative; color characters are very variable in this genus, and for the identification of the species one must employ, ultimately, the male genitalia; this is especially true of the *claripennis* species-group.

1. *Senobasis aedon* (Walker), *N. comb.*

*Dasypogon aedon* Walker, 1849: 343. Type-locality: "Venezuela". Type, BMNH (examined in 1970). Refs. — Walker, 1854: 432; Williston, 1891: 76 (cat.).

*Lochites staurophora* Schiner, 1868: 164. Type-locality: "Colombia". Lectotype ♂, "Venezuela" (Alte Sammlung, n.° 6049, cabinet 10, drawer 378), selected in 1972, WIEN (there are 17 specimens more in this collection). Ref. — Kertész, 1909: 125 (cat.). *N. SYN.*

*Stichopogon aedon*; Kertész, 1909: 83; Hull, 1962: 106; Martin & Papaverro, 1970: 5 (cat.).

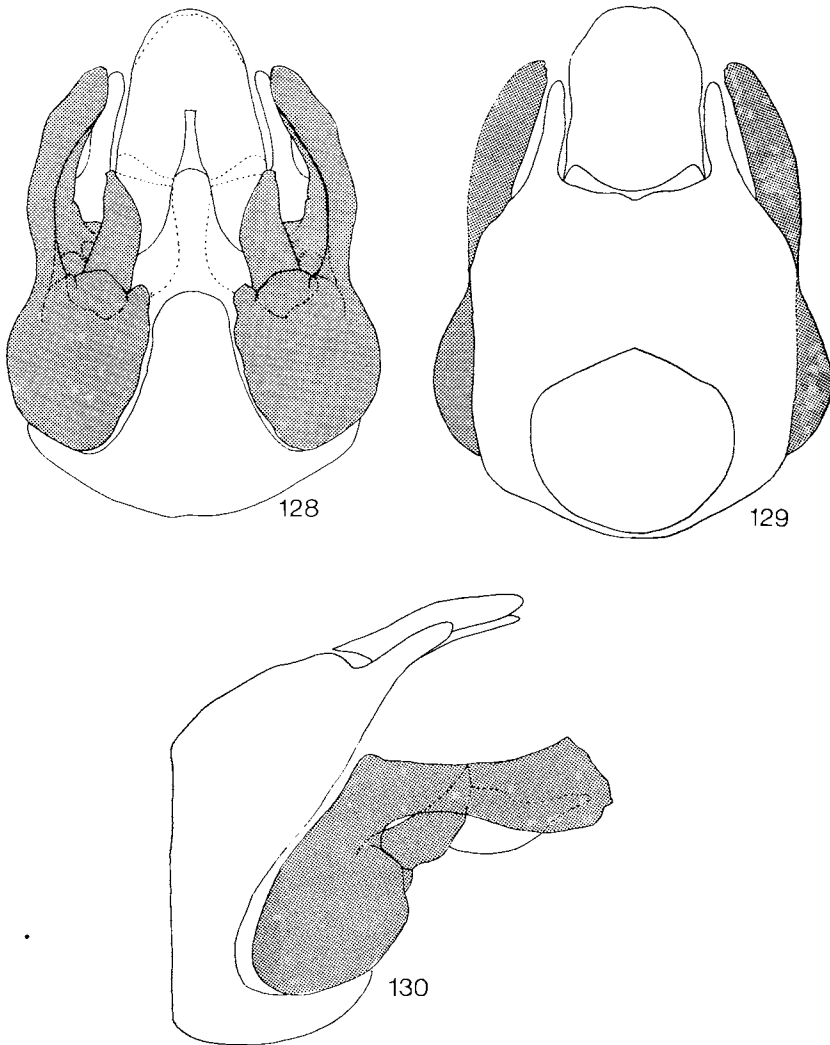


Mesonotum, dorsal view: 126, *Senobasis aedon* (Walker);  
127, *S. mundata* (Wiedemann).

*Neopogon aedon*; Bezzi, 1910: 155.

*Senobasis staurophora*; Williston, 1891: 75 (cat.); Carrera, 1949: 21;  
Carrera & Machado-Allison, 1963: 239; Martin & Papavero, 1970:  
58 (cat.).

*Dasypogon aedon* Walker was inexplicably included by Kertész (1909) in *Stichopogon*. Examination of the type in the BMNH showed that this beautiful species is the same as *Lochites staurophora* Schiner. Male genitalia as in Figs. 128-130.



*Senobasis aedon* (Walker), male genitalia: 128, ventral; 129, dorsal;  
130, lateral.



Material examined: Holotype male of *aedon*, from "Venezuela, ex coll. Dyson, 47-26" (BMNH), and the following specimens. VENEZUELA: *Aragua*: Rancho Grande, 1100 m, x.1950, ix.1951 (Fernández Yopez), v.1953 (Fernández Yopez & Rosales), xi.1952 (Fernández Yopéz), 2 ♂, 3 ♀ (MZUSP); do., v.1945, v-vii.1946 (no collector), 7 ♂, 7 ♀ (two pairs "in copula") (AMNH). COLOMBIA: no other locality (Milde; ex coll. Haglund), in the Riksmuseum, Stockholm.

## 2. *Senobasis analis* Macquart

*Senobasis analis* Macquart, 1838: 53 (1839: 169), pl. 5, fig. 1 (whole insect), 1a (head), 1b (male genitalia). Type-locality: French Guiana, Fleuve Mana (as "Brésil, Lamana", in error; cf. Papavero, 1971b: 130). Type, MNHN (examined in 1970). Refs. — Walker, 1854: 500; Williston, 1891: 74 (cat.); Kertész, 1909: 123 (cat.); Curran, 1934c: 332; Carrera, 1949: 19; Martin & Papavero, 1970: 57 (cat.).

*Senobasis tibialis* Curran, 1934c: 332. Type-locality: Guyana, Bartica, Kartabo. Type ♀, AMNH (examined in 1968, 1971). Ref. — Martin & Papavero, 1970: 58 (cat.). *N. SYN.*

Male genitalia as in Figs. 131-133.

Material examined: Types of *analis* (MNHN) and *tibialis* Curran (AMNH), plus following specimens. PERU, Tingo Maria, 670 m, no date (Weyrauch) (MZUSP); do., Monson Valley, x.1954 (Schlinger & Ross), 1 ♀ (CAS); Achinamiza, xii.1925 (Bassler), 1 ♀ (AMNH); *Junín*: 2 mi. W San Ramon, 900 m, i.1955 (Schlinger & Ross), 1 ♀ (CAS); COLOMBIA: Amazonas, Río Tocana, xi.1946 (Richter) (AMNH). BRAZIL: *Amazonas*: Uaupés (as São Gabriel), Rio Negro (P. Roman), 1 ♀, Riksmuseum, Stockholm; Serra da Neblina, Rio Tucano, 230 m, xii.1965 (Dente), 1 ♀ (MZUSP); *Amapá*: Serra do Navio, ix.1967 (Lenko), 1 ♀ (MZUSP).

## 3. *Senobasis apicalis* (Schiner)

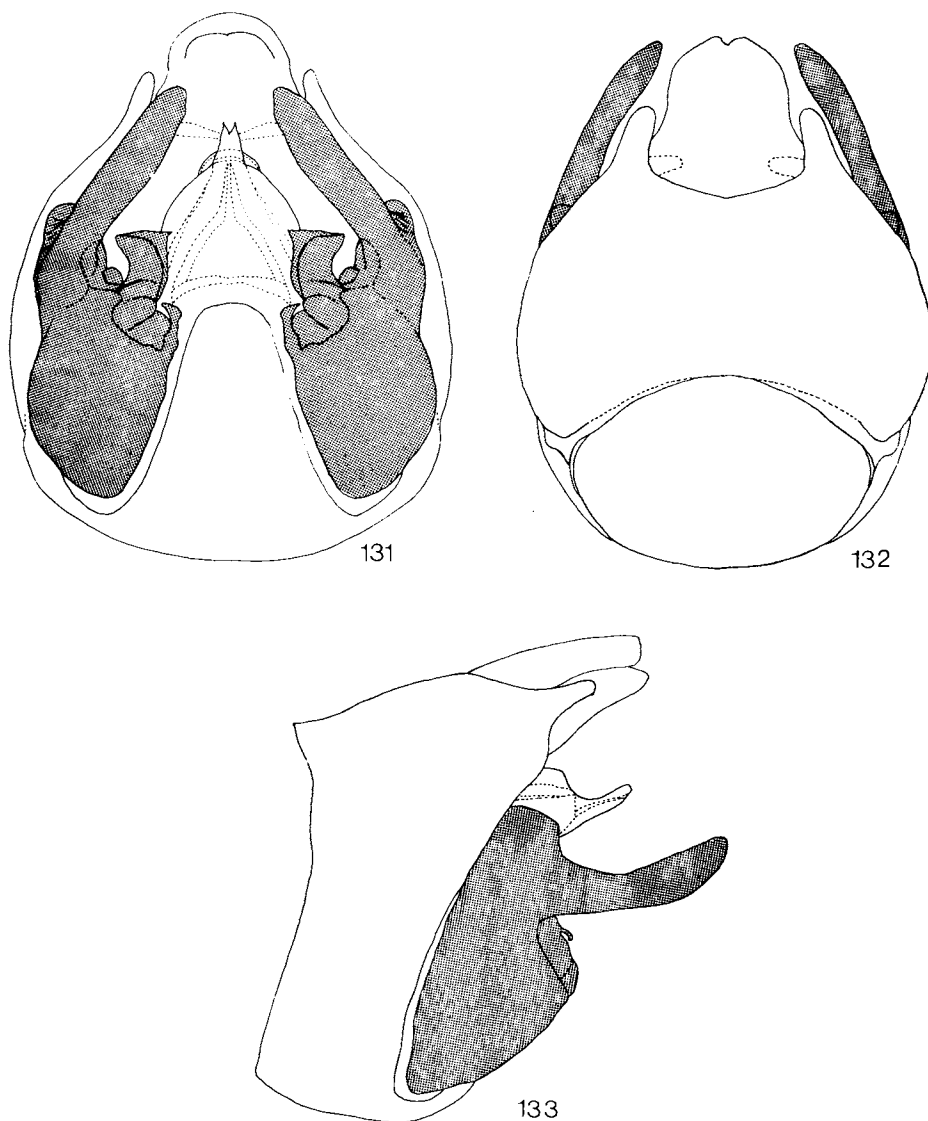
*Lochites apicalis* Schiner, 1867: 370. Type-locality: "Brazil" (Probably Minas Gerais, where Helmreich(en) von Brunnfeld, the collector, stayed most of his time; cf. Papavero, 1973: 295). Type ♂, WIEN (cabinet 10, drawer 378, with *claripennis*; examined in 1972). Ref. — Kertész, 1909: 124 (cat.).

*Senobasis apicalis*; Williston, 1891: 75; Carrera, 1949: 18 (key), 1952: 66 (key), partly misident.; Martin & Papavero, 1970: 57 (cat.).

*Senobasis lopesi* Carrera, 1949: 19, fig. 165 (wing). Type-locality: Brazil, Rio de Janeiro, Teresópolis. Type, MZUSP. Refs. — Carrera, 1952: 65 (key); Martin & Papavero, 1970: 58 (cat.). *N. SYN.* (color variation of *apicalis*).

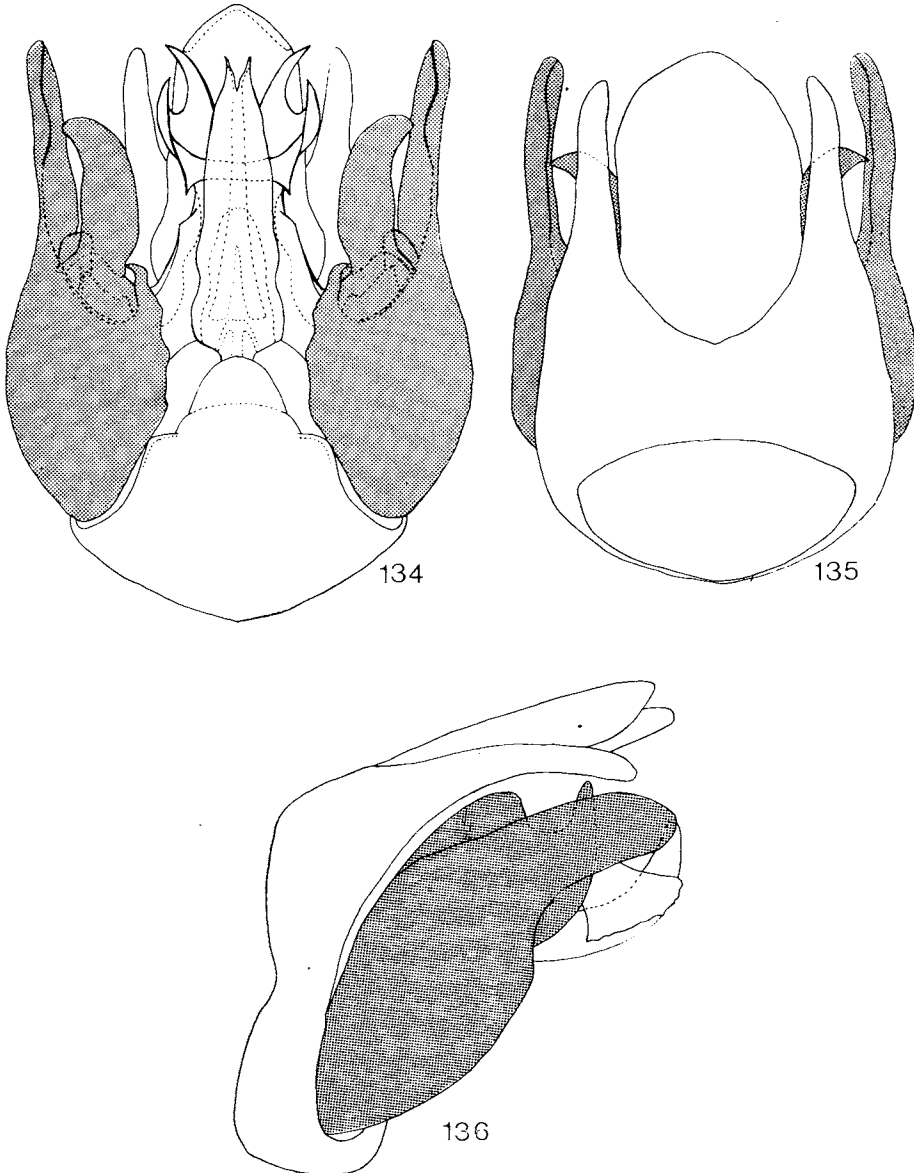
This species can only be correctly identified by the male genitalia (Figs. 140-142); females are extremely difficult to separate from *claripennis* (Schiner).

Material examined: Types of *apicalis* Schiner (WIEN) and *lopesi* Carrera (MZUSP). BRAZIL: *Minas Gerais*: Arceburgo (Faz. Fortaleza), xii.1964 (Barretto), 1 ♂, 1 ♀; *Guanabara*: Rio de Janeiro (Corcovado),



*Senobasis analis* Macquart, male genitalia: 131, ventral; 132, dorsal; 133, lateral.

i.1934 (Travassos), 1 ♀; *Rio de Janeiro*: Angra dos Reis, xii.1931 (Travassos), 1 ♀; do. (Japuiba), xii.1940 (Oliveira & Ventel), 1 ♀; Palmeiras, i.1939 (Lopes), 2 ♂, 5 ♀; Teresópolis, i.1940 (Freitas & Lopes), 1 ♀ (*lopesi*); *São Paulo*: São Vicente (Praia das Vacas), i. 1945 (Carrera), 1 ♂, 3 ♀; São Paulo, no date (Heine), 1 ♂, Riksmuseum, Stockholm. All in MZUSP.



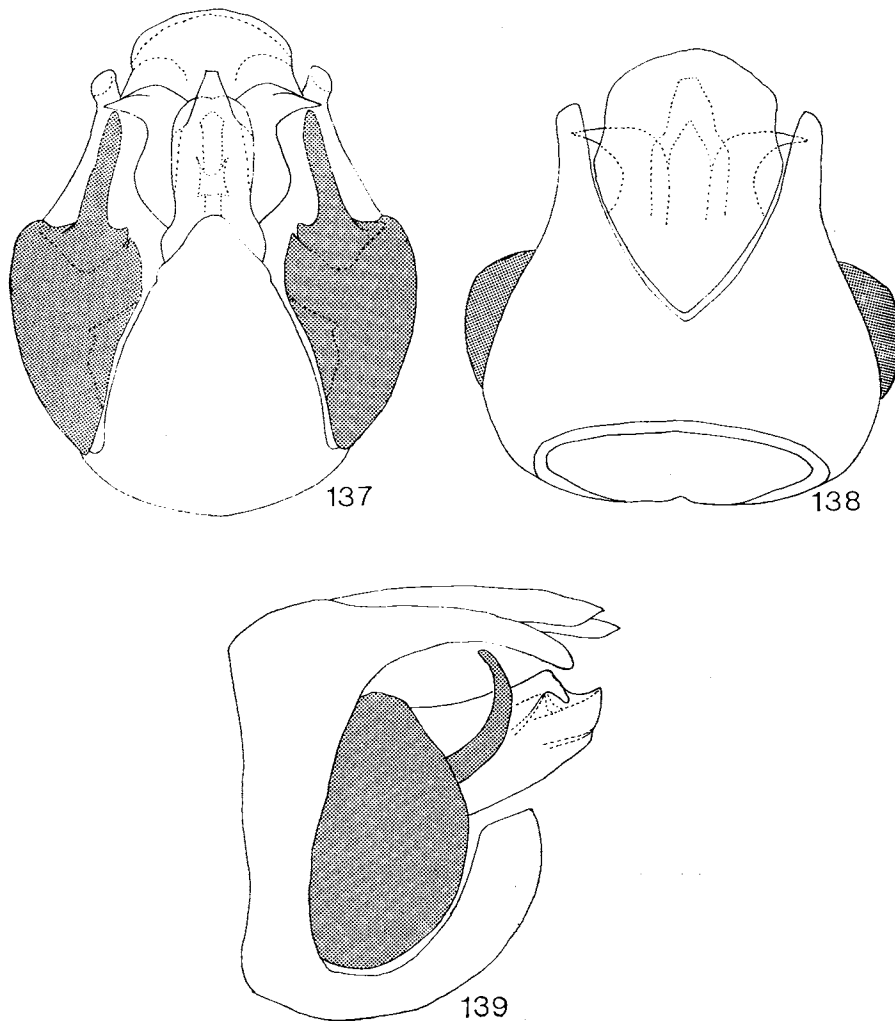
*Senobasis bromleyana* Carrera, male genitalia: 124, ventral; 135, dorsal; 136, lateral.

4. *Senobasis bromleyana* Carrera

*Senobasis bromleyana* Carrera, 1949: 22, fig. 30 (head). Type-locality: Brazil, São Paulo, Campos do Jordão. Type, MZUSP. Refs. — Carrera, 1952: 67; Carrera & Vulcano, 1961: 70 (preys); Martin & Papavero, 1970: 57 (cat.).

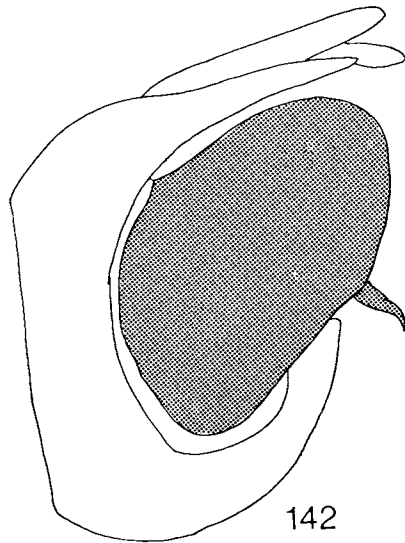
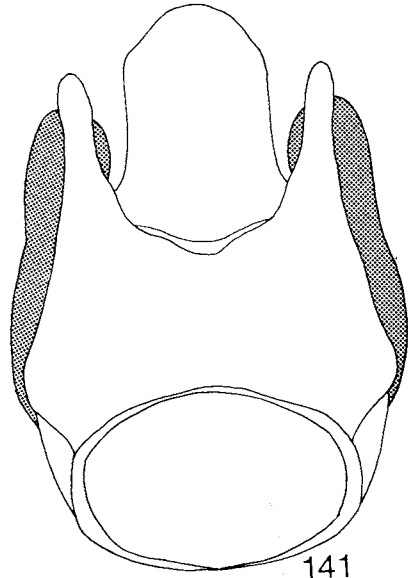
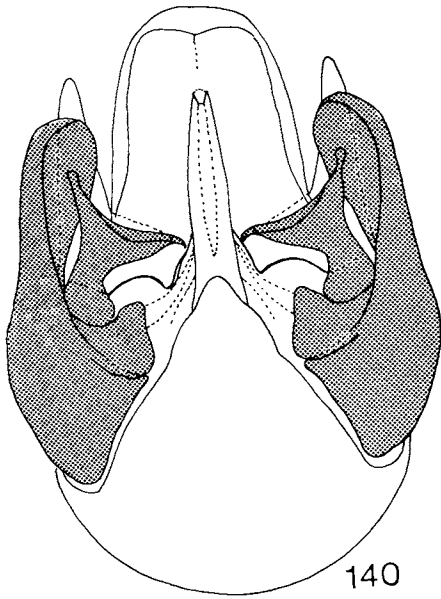
Male genitalia as in Figs. 134-136.

Material examined: BRAZIL, *São Paulo*: Campos do Jordão, i.1963 (Lane), 1 ♂ (holotype); do., iii.1946 (Ramalho), 1 ♀; iii.1945 (Wygod-



*Senobasis lenkoi*, sp. n., male genitalia: 137, ventral; 138, dorsal; 139, lateral.

zinsky), 2 ♀; ii.1958 (Lenko), 6 ♂, 13 ♀; Rio Claro, i.1947 (no collector), 2 paratypes; *Minas Gerais*: Calado (Mun. Ferros), Rio Doce, ii.1939 (Martins & Lopes), 1 ♀; Poços de Caldas (Retiro Branco), iii.1967 (Becker, Roppa & Leoncini), 1 ♀; *Goiás*: Campinas, no date (Worontzow), 1 ♀. All in MZUSP.



*Senobasis apicalis* (Schiner), male genitalia: 140, ventral; 141, dorsal; 142, lateral.

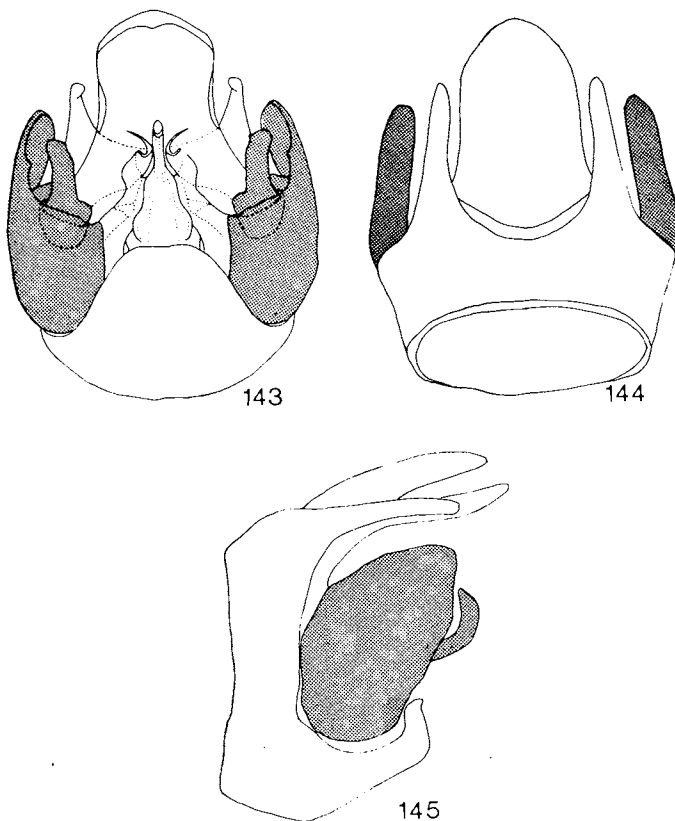
5. *Senobasis claripennis* (Schiner)

*Lochites claripennis* Schiner, 1867: 369. Type-locality: "Brazil" (Bescke) (most probably Nova Friburgo, State of Rio de Janeiro, where Bescke collected; cf. Papavero, 1971b: 87-89). Type ♂, WIEN, n.º 6044 (cabinet 10, drawer 378) (examined in 1972). Ref. — Kertész, 1909: 125 (cat.).

*Senobasis claripennis*; Williston, 1891: 75 (cat.); Carrera, 1949: 25 (part); 1953: 67 (part); Carrera & Vulcano, 1961: 70 (preys); Martin & Papavero, 1970: 57.

Male genitalia as in Figs. 143-145.

Material examined: BRAZIL: *Minas Gerais*: Arceburgo (Faz. Fortaleza), xii.1946 (Barretto), 1 ♂; Belo Horizonte (Caixa de Areia), i.1937 (Martins, Lopes & Mangabeira), 1 ♂; *Guanabara*: Rio de Janeiro (Corvocado), xi.1957 (Alvarenga & Seabra), 1 ♂; do. (Tijuca), xii.



*Senobasis claripennis* (Schiner), male genitalia: 143, ventral; 144, dorsal; 145, lateral.

1944 (Lopes); *Rio de Janeiro*: Castorina, i.1937 (Travassos & Oiticica), 1 ♀; *São Paulo*: Magda (Faz. São Francisco), xii.1957, i.1959 (Lane), 2 ♂, 3 ♀; *Batatais*, xii.1943 (Pereira), 1 ♂; *Paraná*: Iguaçú, xii.1941 (Com. E. N. V.), 1 ♀; *Santa Catarina*: Nova Teutônia, iii.1971 (Plau-mann), 1 ♀. All in MZUSP. One ♂, from the Riksmuseum, Stockholm, has a label "Brasil, F. Sahlb." — probably Rio de Janeiro or Minas Gerais, where R. F. Sahlberg collected (cf. Papavero, 1973: 366-367).

#### 6. *Senobasis clavigera* (Rondani)

*Astylium claviger* Rondani, 1850: 185, pl. 4, fig. 8 (antenna). Type-locality: "Venezuela". Type, TORO (examined in 1972). Refs. — Osten Sacken, 1891: 417; Kertész, 1909: 83 (cat.).

*Senobasis clavigera*; Carrera, 1952: 70 (n. comb.; however, specimens referred to this species are actually *clavigeroides*, sp. n., q. v.); Martin & Papavero, 1970: 57 (cat.).

. Material examined: VENEZUELA: Sebucán Mts., vii.1955 (García), 1 ♂ (MZUSP).

#### 7. *Senobasis clavigeroides*, sp. n.

Very similar to *clavigera* (Rondani), differing however in the color of the antennae (entirely black), and in the color of the facial tomentum (yellow or ochre-yellow). Male genitalia as in figs. 146-148. Carrera (1952: 70, 1953: 65, misidentified this species as *clavigera*).

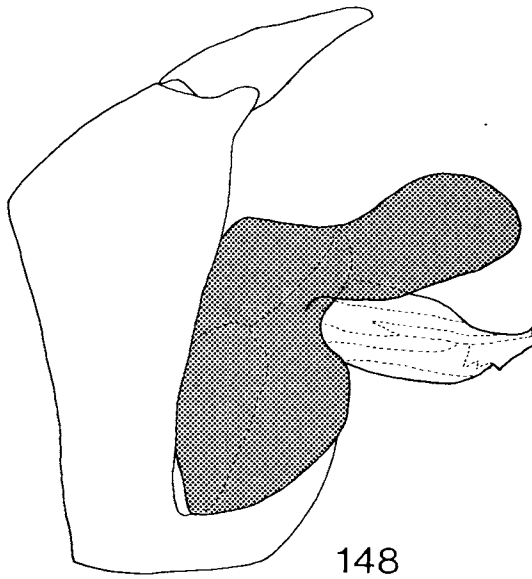
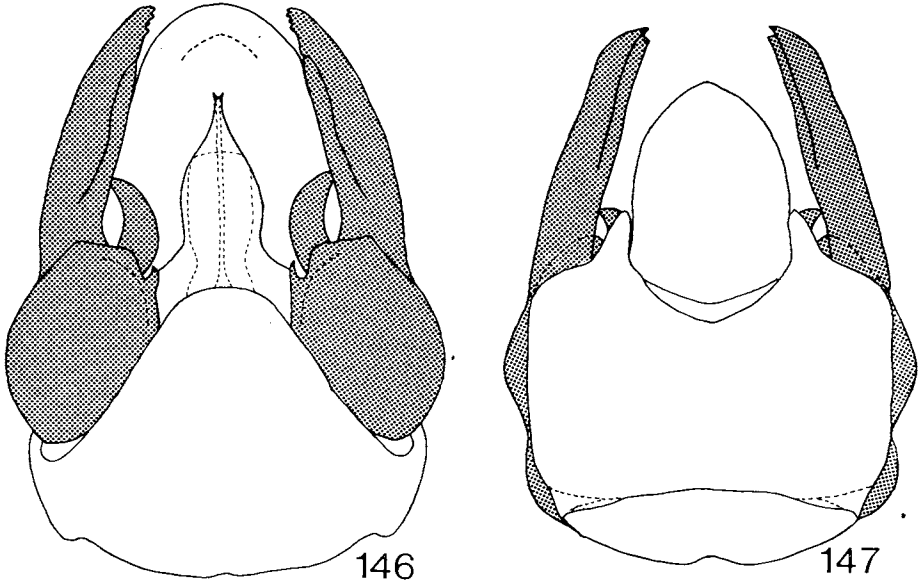
Holotype ♂, ECUADOR: Santo Domingo, 500 m, xii.1940 (DBL), female paratype, same data, in MZUSP; 2 ♂ paratypes, ECUADOR, Santo Domingo, 1930 (Benoist), in the MNHN.

#### 8. *Senobasis corsair* Bromley

*Senobasis corsair* Bromley, 1951b: 12. Type-locality: Panama, Río Indio. Type, USNM (examined in 1968, 1971). Ref. — Martin & Papavero, 1970: 57 (cat.).

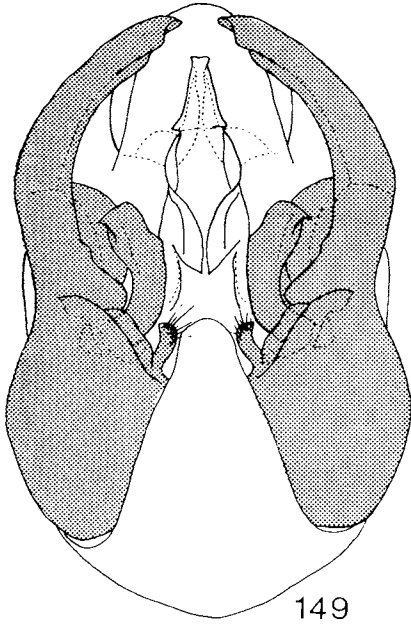
Male genitalia as in Figs. 149-151.

Material examined: COSTA RICA: Sarap, Puerto Viejo, viii.1965 (Slobodchikoff), 1 ♀ (UCB). PANAMA: Canal Zone, Barro Colorado Is., v.1967 (DeLong & Triplehorn), 1 ♂, 1 ♀; do., vi.1966 (W. E. & C. A. Triplehorn), 1 ♂, 1 ♀ (MZUSP); Cerro Campana, vi.1951 (Blanton), 2 ♀ (MZUSP); Pacora, Blue Mts., 2100 ft, vi.1951 (Blanton), 1 ♀ (MZUSP); Río Indio, v.1937 (Frost), paratype ♂ (AMNH). COLOMBIA: *Chocó* (Pacific coast), vi.1950 (Richter), 1 ♂, 1 ♀ (MZUSP).

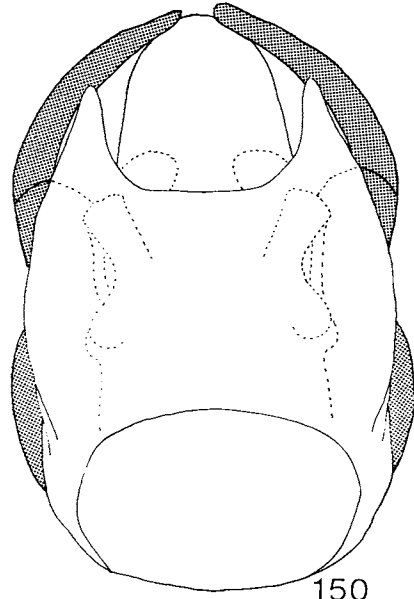


*Senobasis clavigeroides*, sp. n., male genitalia: 146, ventral; 147, dorsal; 148, lateral.

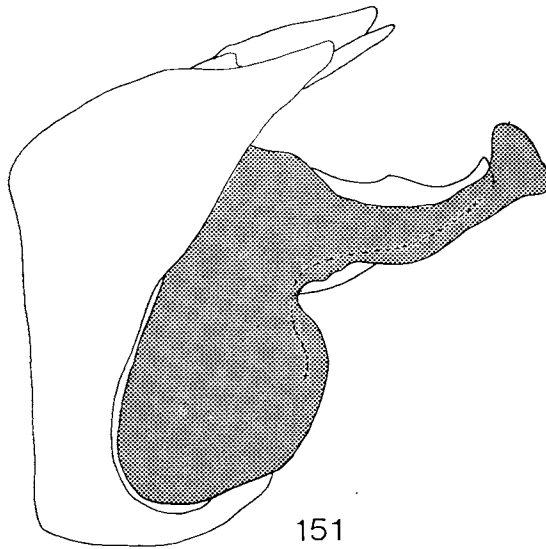




149

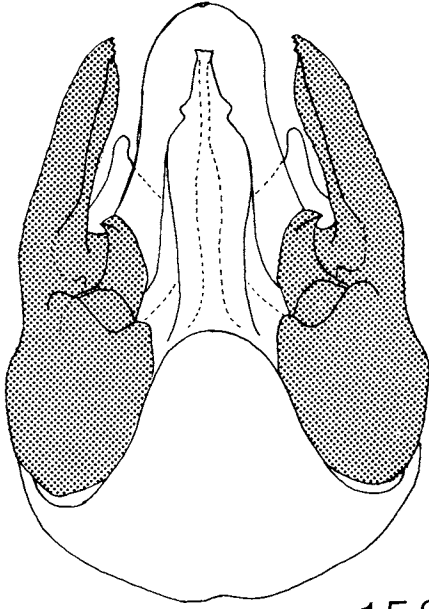


150

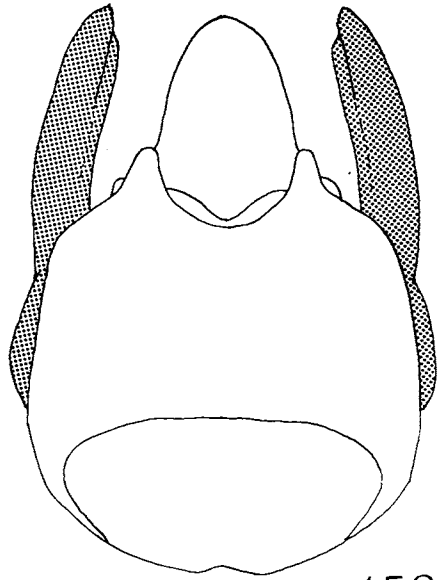


151

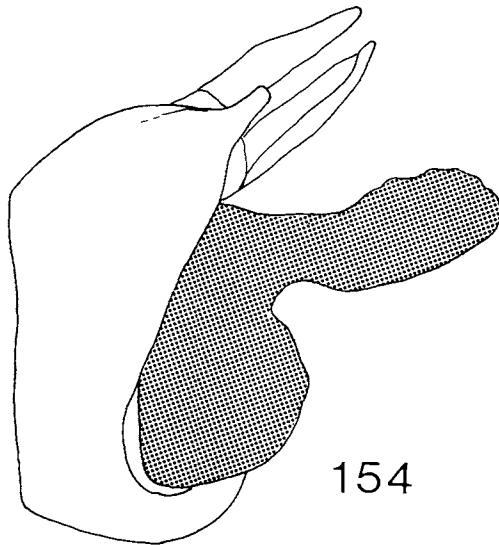
*Senobasis corsair* Bromley, male genitalia: 149, ventral; 150, dorsal;  
151, lateral.



152



153



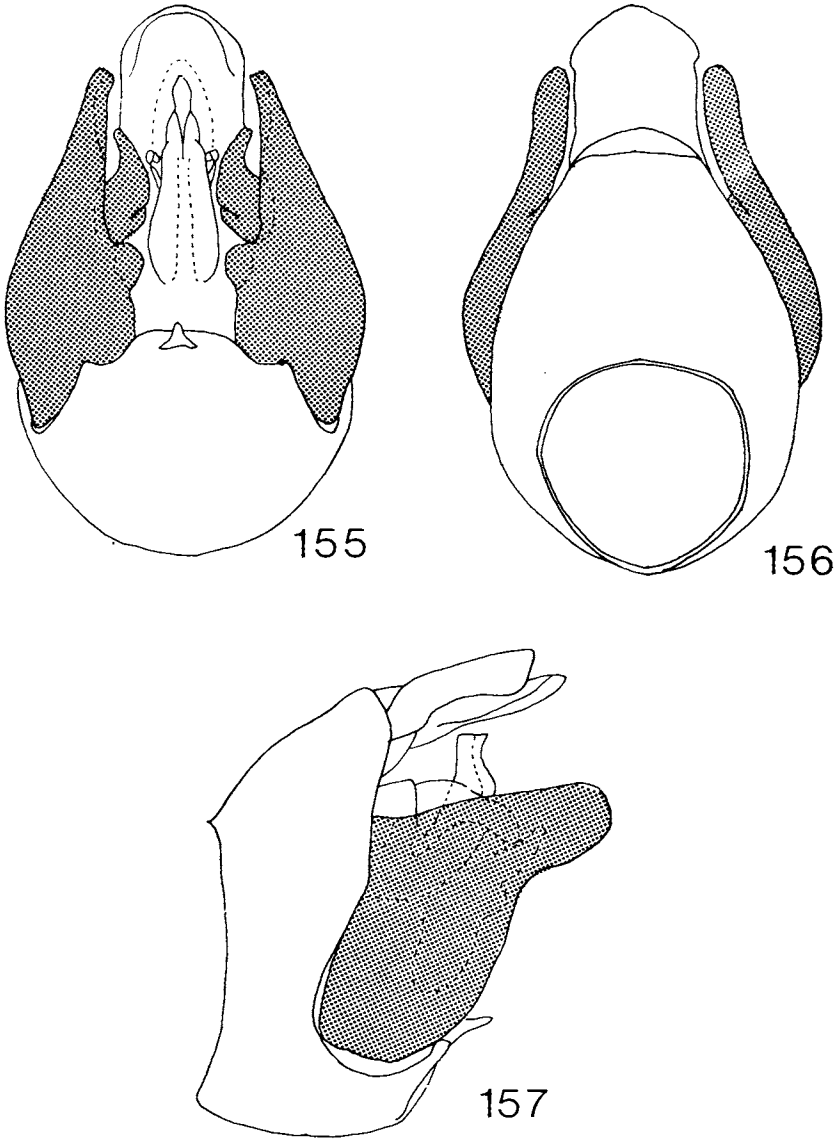
154

*Senobasis flukei* Carrera, male genitalia: 152, ventral; 153, dorsal;  
154, lateral.

9. *Senobasis flukei* Carrera

*Senobasis flukei* Carrera, 1952: 68, fig. 7 (mesonotum). Type-locality: Ecuador, Manabi, Palmar, 200 m. Type, MZUSP. Ref. — Martin & Papavero, 1970: 58 (cat.).

Male genitalia as in Figs. 152-154.



*Senobasis gyrophora* (Schiner), male genitalia: 155, ventral; 156, dorsal; 157, lateral.

Material examined: ECUADOR: *Pichincha*: Santo Domingo de los Colorados, xii.1940 (Laddey), 1 ♂ (paratype); ii.1941 (Laddey), 1 ♀ (paratype); ii.1965 (Schlinger & Ross), 3 ♂, 1 ♀ (CAS); Manabi, Palmar, 200 m, v.1941 (Laddey), 1 ♂ (holotype), 1 ♀ (paratype); Quito, 1930 (Benoist), 1 ♂, 3 ♀ (MNHN); Runtun, xi.1938 (Brown), 1 ♂, 2 ♀ (AMNH); Baños, ii.1939 (Brown), 1 ♂ (AMNH). PERU: Piura, 11 mi. S Sullana, i.1955 (Schlinger & Ross), 1 ♂ (CAS). Unless otherwise stated, all specimens in MZUSP.

#### 10. *Senobasis frosti* Bromley

*Senobasis frosti* Bromley, 1951b: 12. Type-locality: Panama, Pacora. Type, USNM (examined in 1968). Ref. — Martin & Papavero, 1970: 58 (cat.).

This species is known only from the type. More material will be needed to know whether it is or not a good species.

#### 11. *Senobasis gyrophora* (Schiner)

*Lochites gyrophora* Schiner, 1868: 164, pl. 2, fig. 10 (whole insect). Type-locality: "Brazil" (coll. Winthem) (probably from Rio de Janeiro). Lectotype ♂ (lacking left wing), n.º 6046, cabinet 10, drawer 378, WIEN (selected in 1972). Ref. — Kertész, 1909: 125.

*Senobasis gyrophora*; Williston, 1891: 75 (cat.); Carrera, 1952: 70; Martin & Papavero, 1970: 58 (cat.).

Male genitalia as in Figs. 155-157.

Material examined: BRAZIL: *Santa Catarina*: Nova Teutônia, ii.1949, i.1971 (Plaumann), 1 ♂, 1 ♀ (MZUSP); 1 ♀, no locality (MZUSP).

#### 12. *Senobasis lanei* Carrera

*Senobasis lanei* Carrera, 1949: 23, fig. 3 (whole insect). Type-locality: Brazil, São Paulo, Campos do Jordão. Type, MZUSP. Refs. — Carrera, 1952: 73; 1960: 157; Carrera & Vulcano, 1961: 69 (preys); Martin & Papavero, 1970: 58 (cat.).

*Senobasis boraceana* Carrera, 1952: 74. Type-locality: Brazil, São Paulo, Salesópolis, Estação Biológica de Boracéia. Type ♀, MZUSP. Ref. — Martin & Papavero, 1970: 57 (cat.). N. SYN. (color variation of *lanei*).

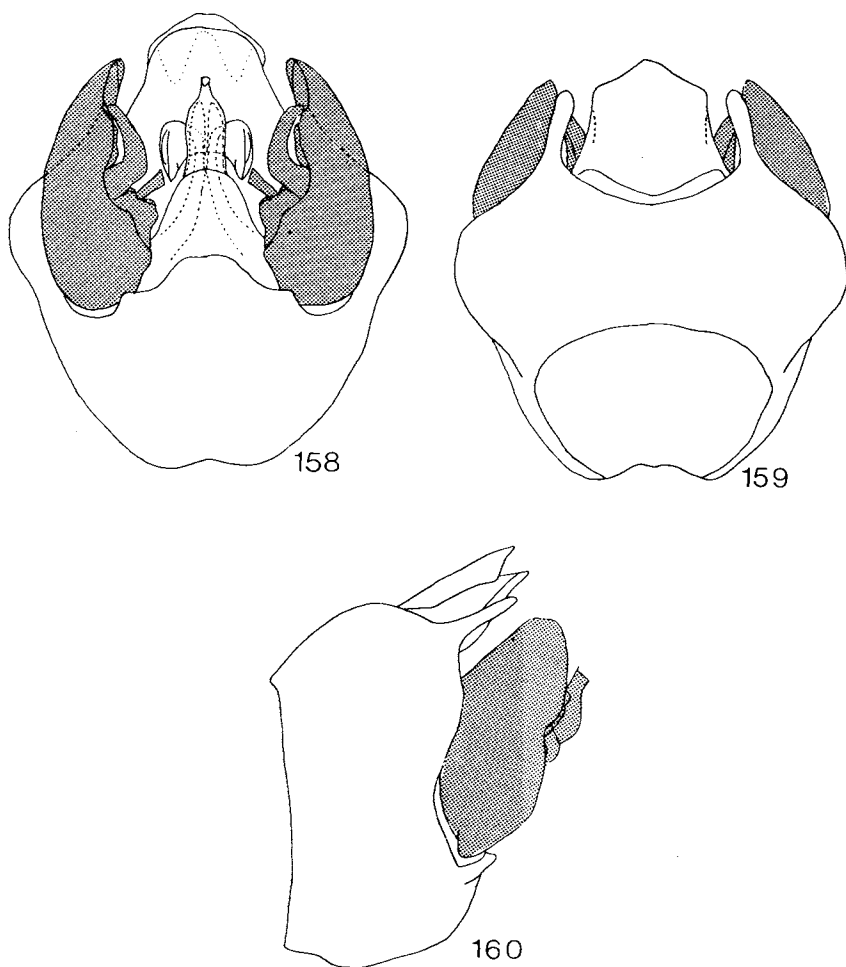
Male genitalia as in Figs. 158-160.

Material examined: BRAZIL: *Minas Gerais*: Açucena, ii.1952 (Machado), 1 ♀; *Rio de Janeiro*: Itatiaia (Macieiras), 1800 m, i.1948 (d'An-

dretta), 1 ♀; *São Paulo*: Campos do Jordão, xii.1944 (Lane), 1 ♀ (paratype), i.1936 (Lane), 1 ♂ (holotype of *lanei*); xii.1946 (Lane), 1 ♂ (paratype); i.1948 (Lane), 1 ♀; xi.1957 (Lenko), 5 ♂, 2 ♀; Bocaina, xi.1967, x.1968 (Alvarenga & Seabra), 2 ♂. All in MZUSP.

### 13. *Senobasis lenkoi*, sp. n.

Very similar to *bromleyana*, but yellow margins of tergites much broader; this species is based on an imperfectly preserved specimen; however, the unique genitalia of the male renders this species so easy to recognize, that I have decided to name it. Male genitalia as in Figs. 137-139.

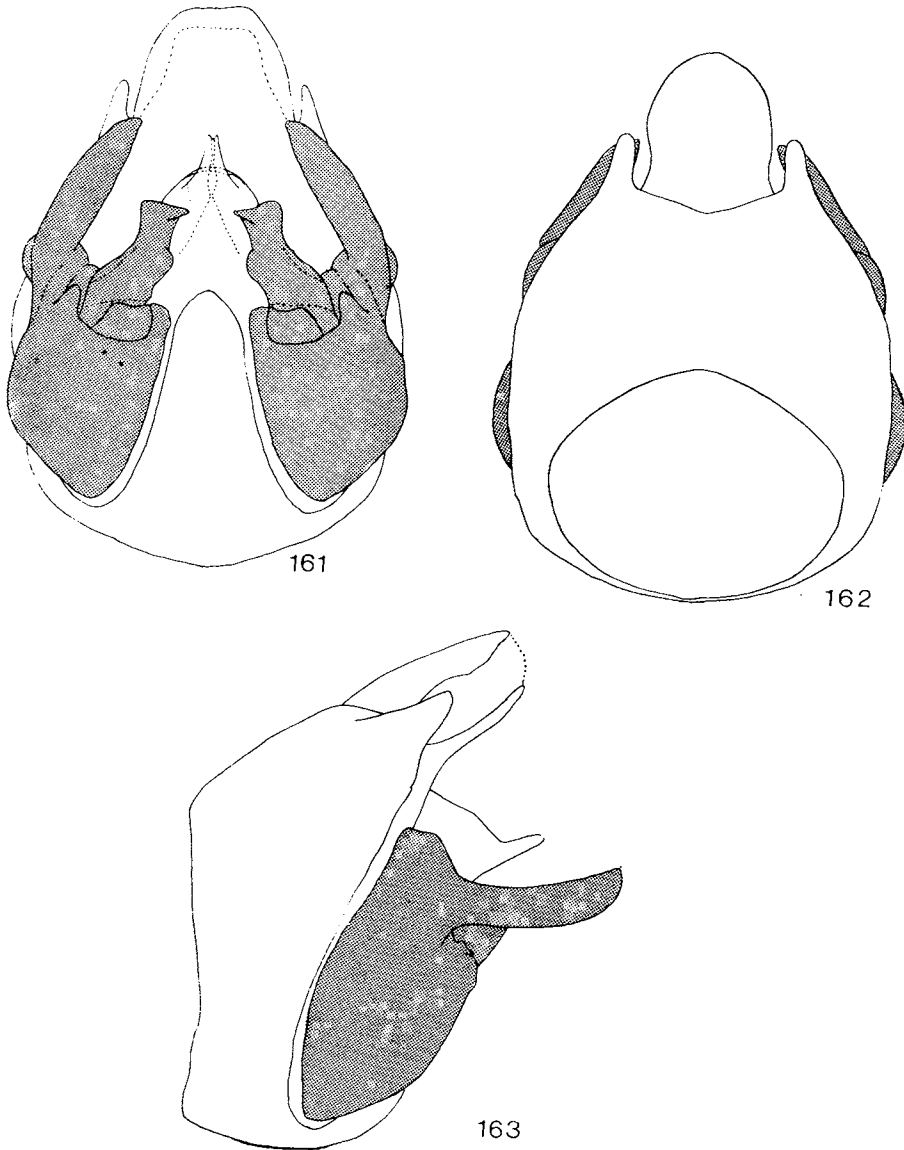


*Senobasis lanei* Carrera, male genitalia: 158, ventral; 159, dorsal; 160, lateral.

Holotype ♂, from BRAZIL, *Mato Grosso*: Utiariti, Rio Papagaio, x.1966 (Lenko & Pereira), in the MZUSP.

14. *Senobasis mendax* Curran

*Senobasis mendax* Curran, 1934c: 333. Type-locality: Guyana, Bartica, Kartabo. Type, AMNH (examined in 1968). Refs. — Carrera, 1949:



*Senobasis mendax* Curran, male genitalia: 161, ventral; 162, dorsal; 163, lateral.

31; 1952: 67; Carrera & Machado-Allison, 1963: 239; Martin & Papaverò, 1970: 58 (cat.).

Male genitalia as in Figs. 161-163.

Material examined: PERU: *Huánuco*: Tingo Maria, Monson Valley, x-xii.1954 (Schlinger & Ross), 2 ♂, 3 ♀ (CAS); Middle Río Marañón, viii.1924 (Bassler), 1 ♂ (AMNH). ECUADOR: *Pichincha*: Santo Domingo de los Colorados, 500 m, i.1944, 1 ♂, 1 ♀ (MZUSP), ii.1955 (Schlinger & Ross), 1 ♀ (CAS). COLOMBIA: Upper Río Loreto, Yuca, Amazonas, x.1946 (Richter), 1 ♂ (AMNH). BRAZIL: *Amazonas*: Uaupés, Rio Negro, xi.1927 (Zikán), 1 ♀ (MZUSP); Serra da Neblina, Rio Tucano, 230 m, xii.1965 (Dente), 1 ♀ (MZUSP). GUYANA: Bartica, Kartabo, no date, 2 ♂, 1 ♀ (MZUSP), vi.1901, 1 ♂, 1 ♀ (MZUSP); iv.1922, iii.1922, 1921 (paratypes 2 ♂, 1 ♀) (AMNH); Bartica Distr., Kalacoon, x.1920 (no collector), paratype ♂ (AMNH); Arakaka, no other data, 2 ♀ paratypes (AMNH); Wismar, iv-vi.1934, iv.1936 (Pinkus), 4 ♀ (AMNH); West bank of Demerara River, ii.1923 (no collector), paratype ♀ (AMNH); 1 pair in copula, "20V" (AMNH); no other data, ii.1913 (no collector), paratype ♀ (AMNH). FRENCH GUIANA: St. Jean du Maroni, 1914 (Benoist), 1 ♂ (MNHN); Charvein, 1914 (Benoist), 1 ♀ (MNHN).

Carrera & Machado-Allison (1963: 239) cited this species from Venezuela (Bolívar).

Carrera (1952: 68) identified several specimens from southeastern and southern Brazil as *mendax*; these are wrongly identified, and probably belong to a new species, unfortunately only known from female specimens. Anyway, they are surely not *mendax* Curran.

#### 15. *Senobasis mundata* (Wiedemann)

*Dasypogon mundatus* Wiedemann, 1838: 569. Type-locality: "Brazil". Type ♀, n.º 122, FRAN (examined in 1972). Refs. — Walker, 1854: 444; Schiner, 1866: 681; Williston, 1891: 67 (cat.); Kertész, 1909: 130 (cat.).

*Stenobasis mundata*; Loew, 1851: 11.

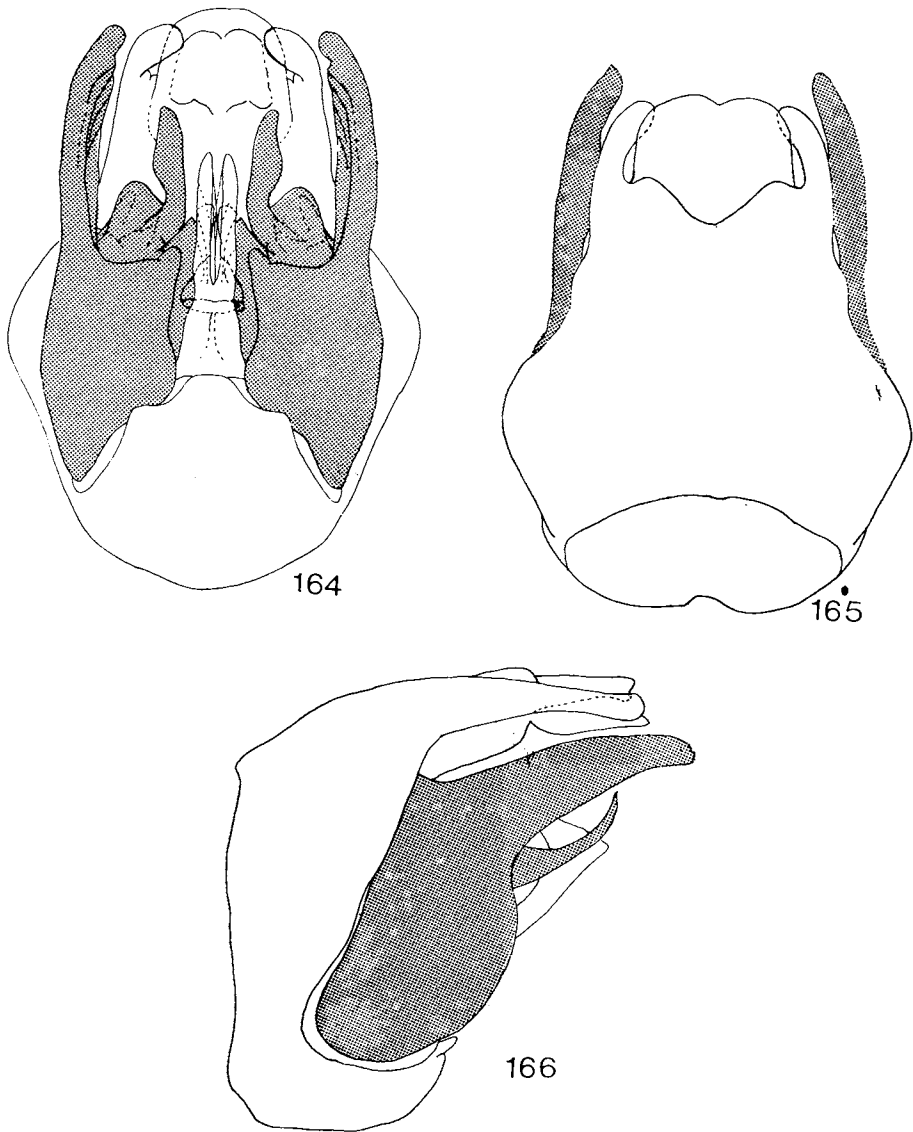
*Senobasis mundata*; Carrera, 1949: 28; 1960: 157; Martin & Papaverò, 1970: 58 (cat.).

*Senobasis gyrophora* (Schiner) of Carrera, 1949: 29 (misident.).

Male genitalia as in Figs. 164-166.

Material examined: BRAZIL: *Rio de Janeiro*: Angra dos Reis, xi.1945 (Lane), 1 ♀; *Guanabara*: Rio de Janeiro (Corcovado), x.1936 (Travassos), 1 ♂; x.1957 (Seabra & Alvarenga), 1 ♂; Rio de Janeiro (Paineiras), iii.1918 (Boehm), 1 ♀; *São Paulo*: São Paulo (Cantareira), xii.1940 (Guimarães & Travassos F.º), 1 ♀; Guarujá, i.1941 (Carrera),

1 ♀; Salesópolis, Estação Biológica de Boracéia, ii.1968 (Oliveira Santos), 1 ♀; *Santa Catarina*: Nova Teutônia, no date, i.1971 (Plaumann), 1 ♂, 1 ♀; xi.1939 (Plaumann), 1 ♀ (AMNH); Cauna, xii.1945 (Maller), 2 ♀ (1 teneral) (AMNH). Unless otherwise stated, all in MZUSP.



*Senobasis mundata* (Wiedemann), male genitalia: 164, ventral; 165, dorsal; 166, lateral.



16. *Senobasis ornata* (Wiedemann)

*Laphria ornata* Wiedemann, 1819: 49. Type-locality: "Brazil" (Freyreiss) (somewhere in southeastern Brazil, probably Rio de Janeiro or Espírito Santo, cf. Papavero, 1971b: 57-58). Lectotype ♀, n.º 123, FRAN (drawer 44), selected in 1972.

*Dasypogon ornatus*; Wiedemann, 1821: 222; 1828: 386, 585; Walker, 1854: 444.

*Lochites ornatus*; Schiner, 1866: 677; 1867: 369.

*Senobasis ornata*; Williston, 1891: 75 (cat.); Kertész, 1909: 125 (cat.); Carrera, 1949: 30; Martin & Papavero, 1970: 58 (cat.).

*Senobasis rhombungulata* Carrera, 1949: 20, pl. 16, fig. 150 (tarsal claws). Type-locality: Brazil, Rio de Janeiro, Angra dos Reis. Type, MZUSP. Ref. — Martin & Papavero, 1970: 58 (cat.). *N. SYN.*

Male genitalia as in Figs. 167-169.

Material examined: Holotypes of *ornata* Wiedemann (FRAN) and *rhombungulata* Carrera (MZUSP), plus following specimens: BRAZIL: no other data, Coll. Winthem, 10 specimens, n.º 6048, cabinet 10, drawer 378 (WIEN); *Rio de Janeiro*: Angra dos Reis, xii.1932 (Travassos F.º), holotype of *rhombungulata* (MZUSP); *Espírito Santo*: Baixo Guandu, x.1970 (Elias), 2 ♂, 4 ♀; Itapina, xi.1970 (Elias), 1 ♂, 1 ♀ (MZUSP).

17. *Senobasis notata* (Bigot), *N. comb.*

? *Diogmites notatus* Bigot, 1878: 416. Type-locality: "Amazonia". Type lost. Ref. — Martin & Papavero, 1970: 26 (cat.).

*Deromyia notata*; Williston, 1891: 75 (cat.); Kertész, 1909: 117 (cat.).

? *Senobasis notata*; Carrera & d'Andretta, 1953: 65.

*Senobasis weyrauchi* Carrera, 1952: 72, fig. 9 (abdomen). Type-locality: Peru, Loreto, Pucallpa, 200 m. Type, ? Refs. — Carrera, 1953: 64; Martin & Papavero, 1970: 58 (cat.). *N. SYN.*

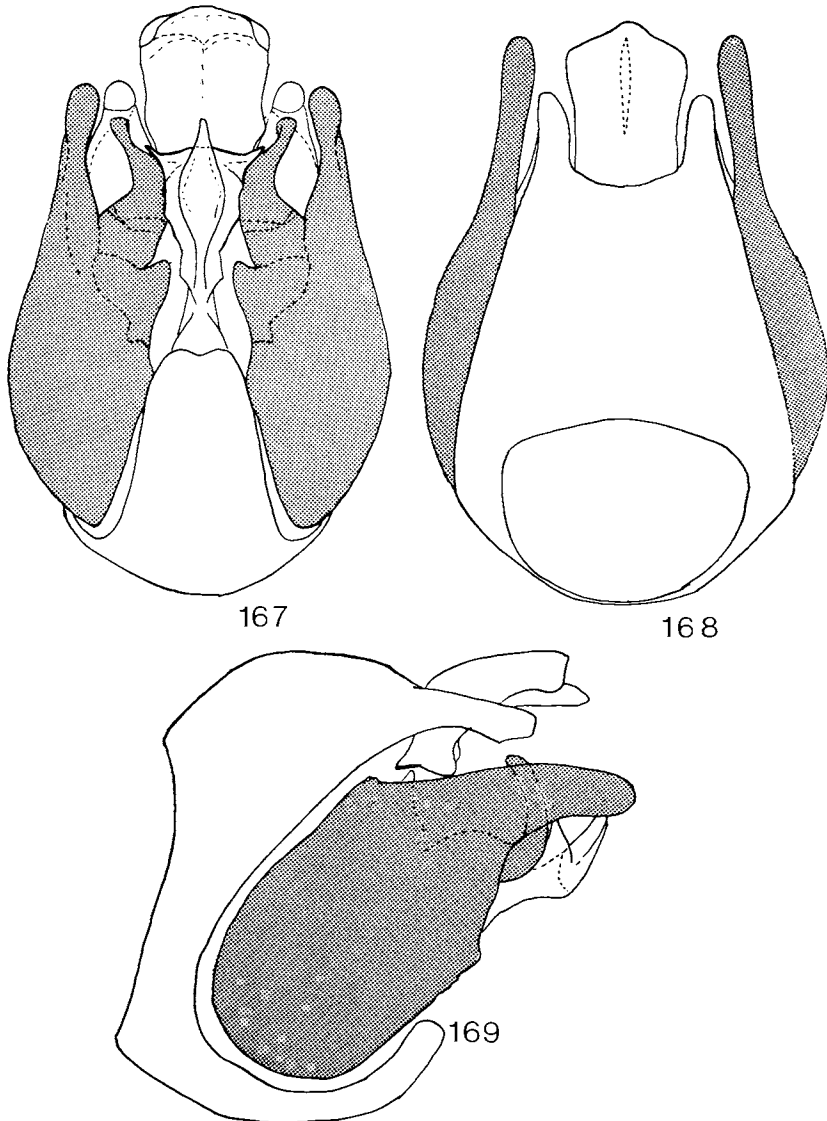
Male genitalia as in Figs. 170-172.

Bigot's description applies perfectly well to this species; therefore I propose this new synonymy.

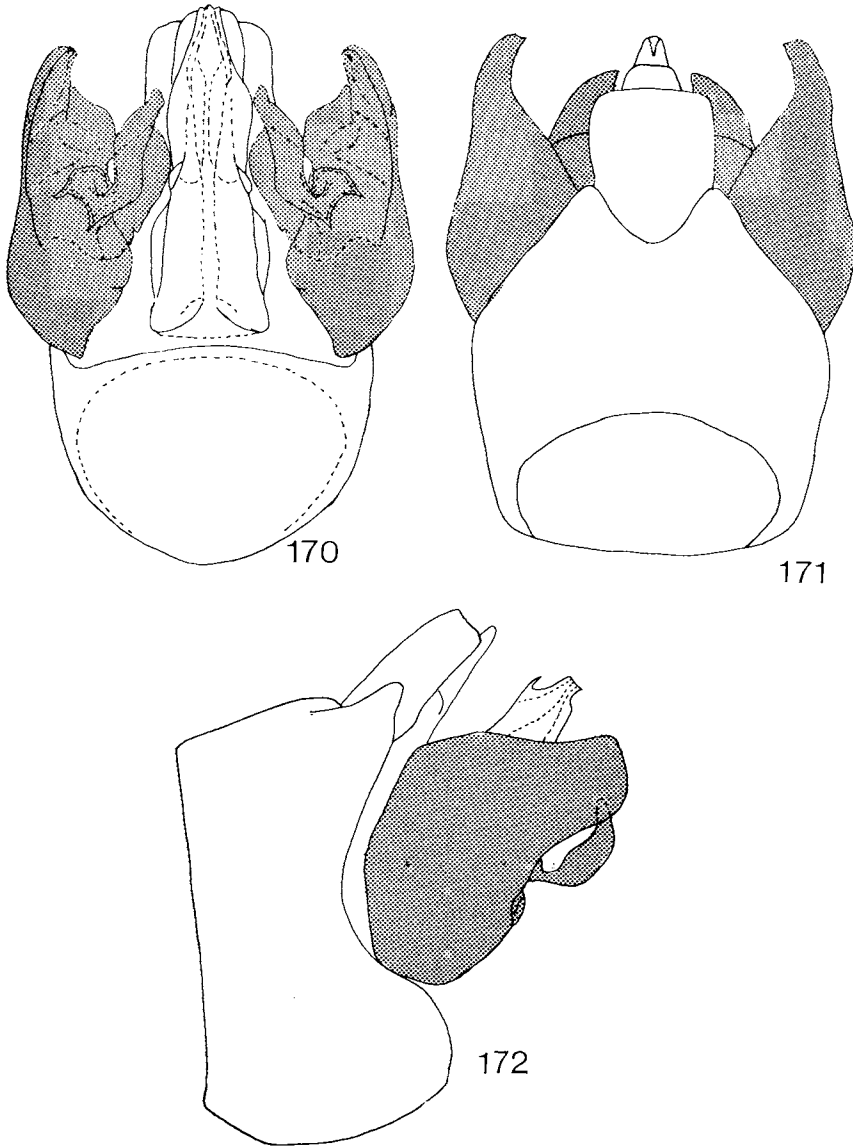
Material examined: ECUADOR: El Napo, x.1939 (Benoist), 1 ♂ (MNHN). BRAZIL: *Amazonas*: Manaus, no date (Huebner), 1 ♀ (Riksmuseum, Stockholm); *Pará*: boca do Rio Cuminá-Miri, Oriximiná, i.1968, ix.1969 (Exp. Perm. Amaz.), 1 ♂, 3 ♀ (MZUSP); Jacareacanga, ix.1959 (Alvarenga), 1 ♂ (MZUSP); Óbidos, xi.1956 (Oliveira), 1 ♂, 1 ♀ (MZUSP); Belterra, ii.1957 (Pereira & Machado), 1 ♀ (MZUSP); *Amapá*: Serra do Navio, x.1957 (Lenko), 2 ♀ (MZUSP).

## Species "incertae sedis"

*Senobasis almeidai* Carrera, 1946: 121. Type-locality: Brazil, São Paulo, Araraquara. Type, MZUSP. Refs. — Carrera, 1949: 18 (key); 1952: 66 (key); Martin & Papavero, 1970: 57 (cat.).



*Senobasis ornata* (Wiedemann), male genitalia: 167, ventral; 168, dorsal; 169, lateral.



*Senobasis notata* (Bigot), male genitalia: 170, ventral; 171, dorsal;  
172, lateral.

## 6. THE NATURAL HISTORY OF THE MEGAPODINI

Very little is known regarding the ecology and biology of this tribe. However, some information may be obtained, from two types of evidences: direct and indirect.

As to the direct evidences: *Cyrtophrys attenuatus* (Loew) was captured by José Henrique Guimarães on bushes along a trail in the Atlantic forest of the Serra do Mar, in Nova Friburgo, State of Rio de Janeiro. *Senobasis notata* (Bigot) was collected by Francisca C. do Val at the mouth of the river Cuminá-Miri, Oriximiná, State of Pará, in trails across a second growth forest. I have collected *Megapoda labiata* (Fabricius) in the interior of a forest at Taperinha, Santarém, State of Pará; the specimen of *Megapoda* was sitting on a leaf of a shrub of some 30 cm of height, in the interior of the forest, where there was no sun, with the anterior legs well expanded forwards, clearly showing the long, yellowish anterior basitarsus; in certain moments it would elevate one of the front legs, "waving" with it, and then did the same with the other front leg; this was probably some kind of sexual display.

The indirect evidence is as follows; the examination of the distribution maps of *Cyrtophrys*, *Megapoda*, *Senobasis*, and *Pseudorus* (except *P. mexicanus*), and their comparison with vegetation maps (Hueck, 1966; Haffer, 1969: fig. 1; Haffer, 1970: fig. 1), shows that the species of these genera occur exclusively in areas covered by forests; open formations (caatingas, cerrados, deserts and semi-deserts, pampas, etc.) seem to be avoided by the above mentioned genera. On the other hand, *Pronomopsis* is surely associated to the desertic formations of Chile and Peru, especially the high altitude deserts of Tarapacá and Antofagasta (see description in Cortés & Campos, 1971: 12-16). *Deromyia* occupies so many different areas in Chile, that it is almost impossible to make generalizations about its ecology, without firsthand information.

As to the biology of the Megapodini, still less can be said. In the USNM there are several reared specimens of *Pseudorus distendens* (Wiedemann); the puparia were obtained from Cerambycidae galleries in an orange-tree. So, it is highly probable that larvae of this species (*distendens*) are predators of Cerambycidae larvae.

As to the preys eaten by the adults, Engel & Cuthbertson (1934: 46) found *Lagodias bivittatus* (Curran), preying upon *Orphnus pugnax* Pér. (Scarabaeidae), in South Rhodesia, and also upon *Glossina morsitans* (Glossinidae). Carrera & Vulcano (1961) cite *Cyrtophrys attenuatus* (Loew) preying on Dolichopodidae, Lauxaniidae, and Muscidae; *Senobasis lanei* Carrera on Stratiomyidae and Vespidae; *Senobasis claripennis* (Schiner) (*sensu* Carrera, 1949) preying upon Formicidae, and *Senobasis bromleyana* Carrera upon Tenthredinidae.

The different types of ovipositor among the Megapodini suggest at least 3 different types of oviposition, and therefore of larval biology.

Mimicry is another interesting aspect of this tribe, which has not been investigated. *Pronomopsis*, for instance, is a perfect mimic of an

undetermined genus of Psammocharidae — both are entirely black, the wasp has intensely yellow antennae, which seem to be mimicked by the intensely yellow fore legs of *Pronomopsis*. Further investigations into this field would reveal many interesting facts.

## 7. GEOGRAPHICAL DISTRIBUTION

The Megapodini are relatively rare in collections, very few species are represented by reasonably good series, most of them being known from very few specimens. However, the mapping of the localities known until now shows certain well-defined patterns of distribution, which will be discussed below.

The tribe, as a whole, is mostly African (secondarily invading the Palearctic and Oriental regions) and South American (secondarily invading the Mexican plateau and Central America). In the Neotropical Region the Megapodini occur all over the South American continent, Central America, and Mexico (to Sonora); the group does not enter the Antilles. Two genera are predominantly Chilean (*Deromyia* and *Pronomopsis*); four (*Cyrtophrys*, *Senobasis*, *Megapoda* and *Pseudorus*) are overwhelmingly Guiano-Brazilian, normally with three definite patterns of distribution: an Amazonian, cis-Andean group of species; a group in the forests of southeastern and Southern Brazil; and a third group of species in the Northwestern Arch of South America, normally invading Central America.

*Cyrtophrys* (Map 1) is known from southeastern and southern Brazil, spreading westwards to northern Argentina (Tucumán); a single specimen is known from Venezuela (Valle Seco, Estado de Carabobo), far away from the main area of distribution of the genus.

*Deromyia* (Map 2) ranges from Valparaiso (Salto) to Cautín (Temuco), in Chile, or approximately from latitude 33° S to 39° S; in Argentina it enters Bariloche (Province of Rio Negro), at a latitude of 41° S. According to elevation, the genus ranges from sea level to above 1000 m, as in the Cordillera de Chillán (1100-1480 m), Pichinahuel (Arauco, 1100-1400 m), and Pehuenco (Malleco, 1150 m).

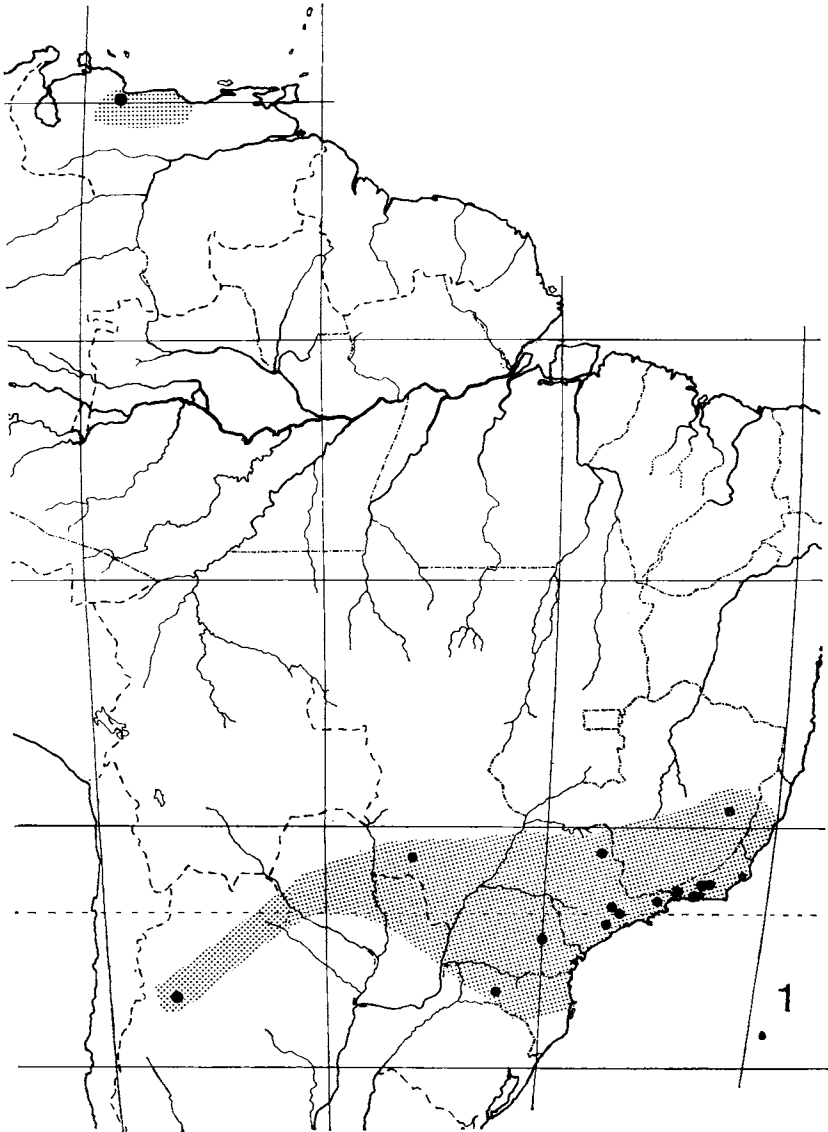
*Pronomopsis* (Map 3) seems to be limited to great altitudes, ranging from Cusco and Mamara (Apurímac), in Peru, to Mendoza, in Argentina; in the Quebrada Hécar (Antofagasta) it reaches 5690 m of altitude.

*Megapoda* (Map 3) presents a disjunct distribution: to the north, it occupies almost all the Amazonian region; to the south, the Atlantic coast (forested areas), from Mamanguape, State of Paraíba, to Southern Brazil (São Paulo and Mato Grosso).

*Senobasis* (Maps 4-5) presents several well-defined patterns of distribution:

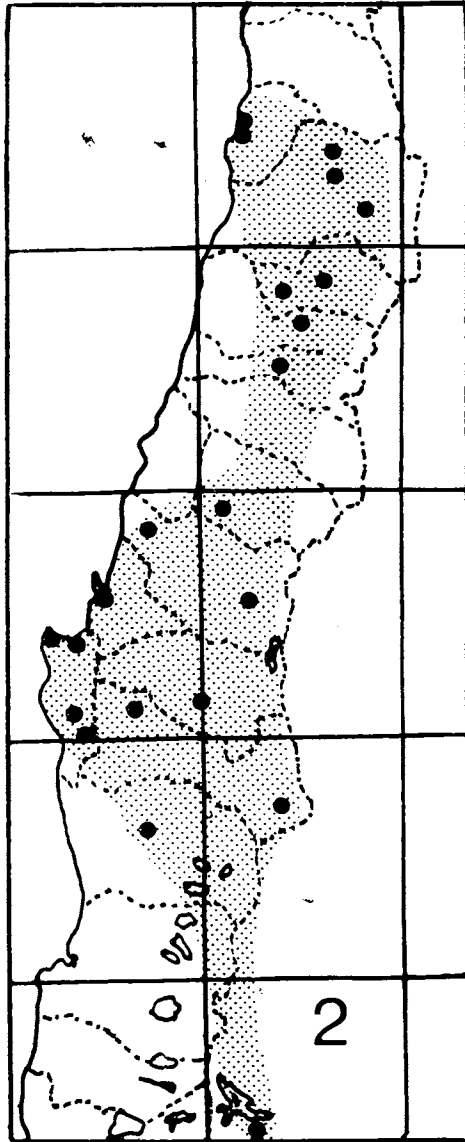
1. the *gyrophora*-group is disjunct in the Guiano-Brazilian sub-region: *notata* (as *weyrauchi* in Map 4) occupies the Amazonian basin, while *lanei*, *mundata*, and *gyrophora* occupy the forests of southeastern and southern Brazil;

2. the *claripennis*-group (*claripennis* and *apicalis*) is restricted to the southeastern and southern parts of Brazil (Map 4);



Map 1, Geographical distribution of *Cyrtophrys* Lcew.

3. the *analis*-group is also disjunct in the Guiano-Brazilian sub-region — *analis*, *lenkoi* and *mendax* occupy the Amazonian basin; *ornata* and *bromleyana* southeastern and southern Brazil; this group also presents a trans-Andean species, *corsair*, from Coastal Colombia (Chocó) and Panama;



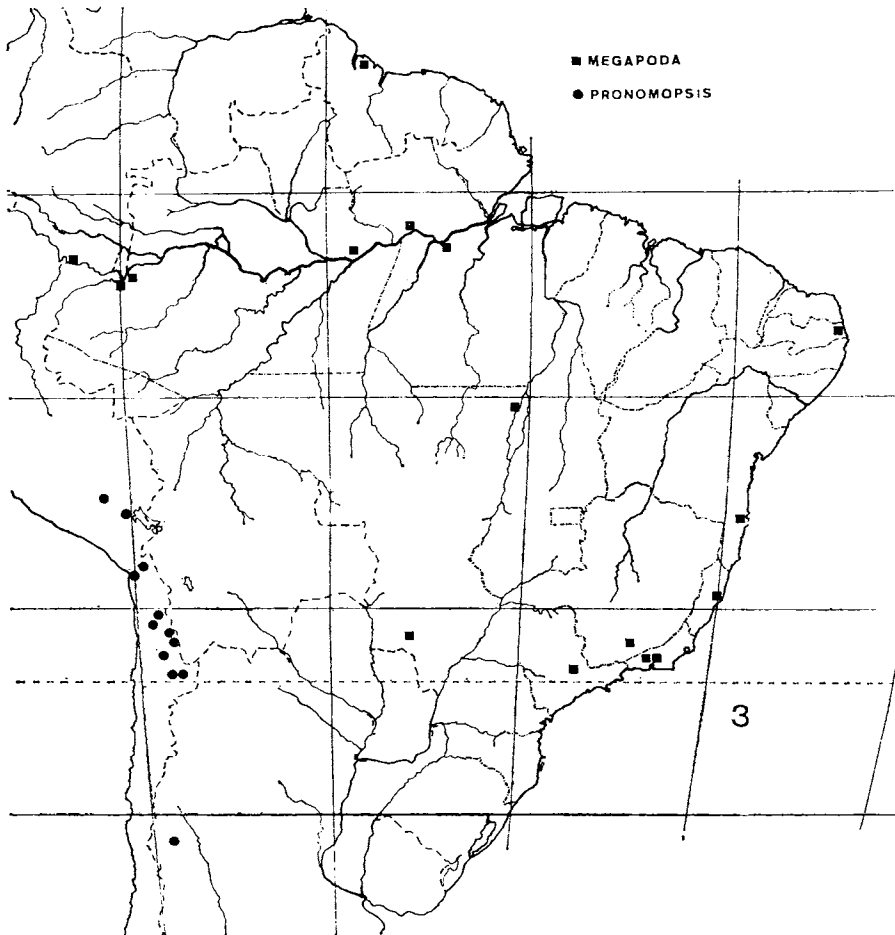
Map 2, Geographical distribution of *Deromyia Philippi*.

4. the *clavigera*-group is entirely trans-Andean, occupying the Northwestern Arch of South America, and Central America: *flukeyi* and *clavigeroides* in Ecuador; *aedon* and *clavigera* in Colombia and Venezuela, and *frosti* in Panama.

*Senobasis* does not extend very much into Central America; it seems that this genus has only very recently invaded Central America.

Finally, *Pseudorus* (Maps 6-7) also presents several different patterns:

1. *dimidiatus* Oldroyd occurs in the Amazonian region;
2. the *rufiventris*-group is widely disjunct — *rufiventris* (Roeder) occurs in Peru and western Brazilian Amazonia; *martini*, sp. n., in several States of Mexico;



Map 3, Geographical distribution of *Megapoda* Macquart and *Pronomopsis* Hermann.

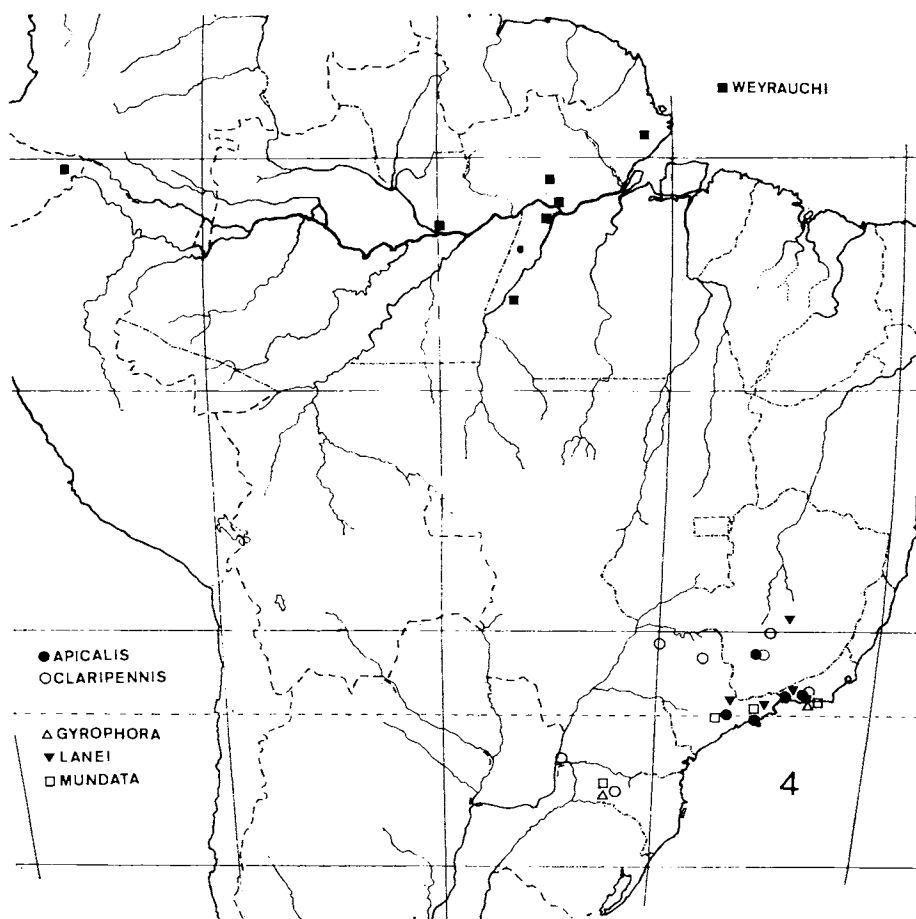


3. the *bicolor*-group has a widely disjunct distribution, as the above group — *holcocephalinus*, sp. n., is only known from the Brazilian State of Santa Catarina; *bicolor* Bellardi is a Mexican species;

4. *dandrettiae* Carrera is limited to southeastern and southern Brazil;

5. the *distendens*-group is very widespread, ranging from the Sonoran Desert (Mexico: Sonora) to southern Brazil; only two species are provisionally considered in this group: *mexicanus* (Bromley), confined to the Sonoran Desert, and *distendens* (Wiedemann), apparently restricted to the forested areas of the Neotropical region;

6. the *piceus*-group, which differs from the five other mentioned before by the presence of 3 submarginal cells, is only known from southeastern and southern Brazil, although Oldroyd (1964b) also mentions it from Peru; this record must be confirmed.



Map 4, Geographical distribution of *Senobasis* Macquart: (1) *gyrophora*- and *claripennis*-group (antennae yellow).

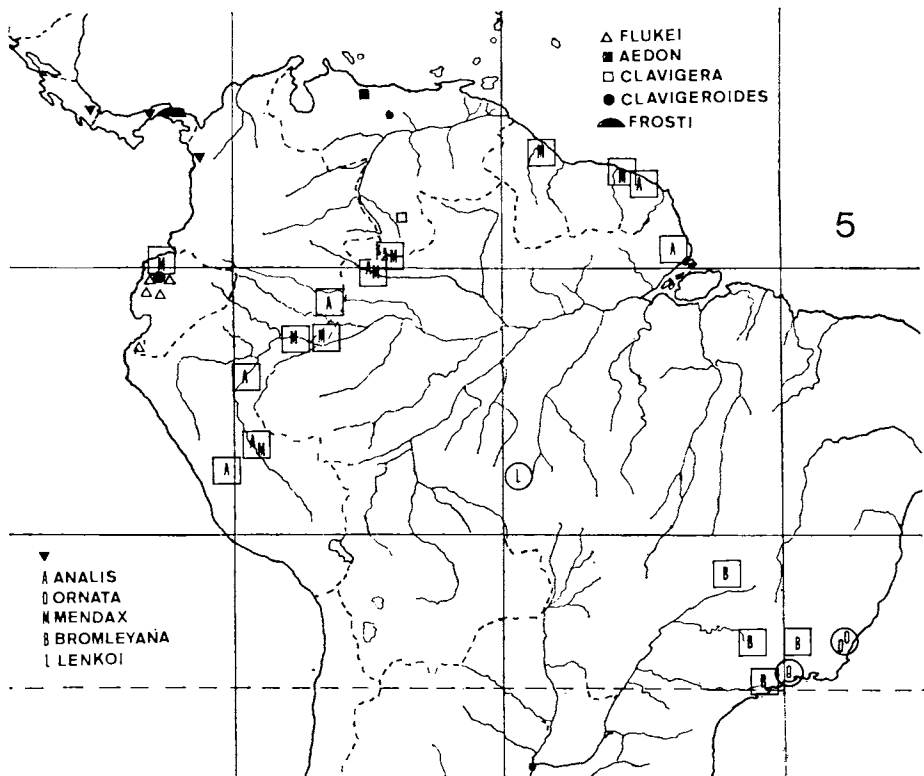
In short, the species of *Pseudorus* are still very poorly known, and many new records must be expected, in order to clarify their distribution.

As to the Old World genera: *Lagodias* occupies almost all the African continent, from Senegal and Sierra Leone to the west, to Kenya, in the east, south to South Africa, where the greatest number of species exist; the genus also occupies the continental islands of Africa, and has colonized Madagascar, where it seems to have undergone a radiation; in Asia *Lagodias* occupies an extensive area, extending to the Transcaspia, Mongolia and Manchuria, to eastern China (Hong Kong and Hainan), going south to India, Birmania and Java. *Pegesimallus* is known only from the region comprehended between the Congo and South Africa.

## 8. HYPOTHETICAL HISTORY OF MEGAPODINI EVOLUTION

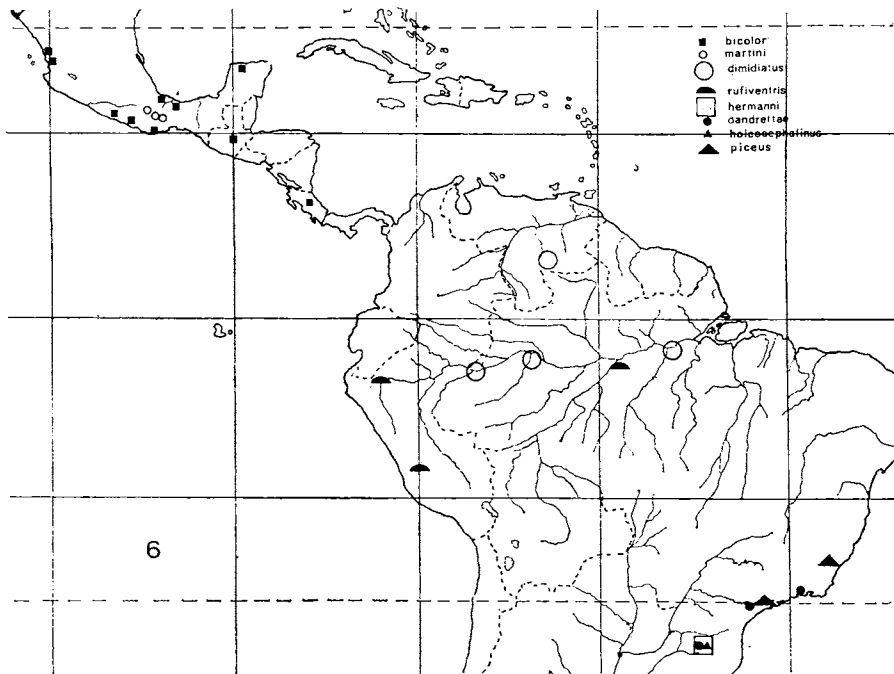
### 8.1. CHARACTERS OF THE HYPOTHETICAL ANCESTRAL STOCK

A balance of the primitive conditions of the several genera of Megapodini permits the "composition" of a hypothetical ancestor. This primitive stock should present the following characters:



Map 5, Geographical distribution of *Senobasis* Macquart: (2)  *analis*- and  *clavigera*-groups (antennae black).

Medium size; body moderately slender, with moderate pilosity; head wider than high; face parallel-sided, slightly divergent below, plane in lateral view, only slightly prominent on epistomal margin, with moderate hairs and bristles; mystax not much developed, limited to lower 1/3 of face; subepistomal area moderately large, concave, slightly oblique in profile; palpi 2-segmented, the second segment with apical pore; proboscis not very long, laterally compressed and moderately pilose on ventrobasal surface; antenna moderately long, the 3rd segment spindle-shaped, attenuate at base, somewhat dilated in the middle, with a well-developed apical style bearing a minute spine; occiput weakly prominent and developed; cervicalia moderately convex, almost plane; acrosticals and dorsocentrals present; lateral bristles developed; scutellars reduced; wings hyaline, with all cells largely open; legs moderately long and slender, with moderately developed hairs and bristles; anterior tibia with apical spur; anterior basitarsus with more or less developed basal plate; abdomen moderately slender, subclavate and pilose; first tergites with "bullae" on posterior margin, plane anteriorly; lateral margins of tergites 1-2 with well-developed bristles; female terminalia formed by tergite 9, with spinous acanthophorites; male genitalia non-rotated, epandrial halves fused, forming a single plate, which is also fused to the hypandrium, the 9th segment thus forming a complete ring; cerci coalesced, forming with the anal lamellae an elongate, well-developed, collar-like proctiger; basistyli simple, moderately large at base, tapering towards apex; dististyli with approximately the same shape, subapically placed on the basistyli; aedeagus simple, conical, elongate, without lateral projections.



Map 6, Geographical distribution of *Pseudorus* Walker.

## 8.2. ORIGIN OF THE MEGAPODINI ANCESTRAL STOCK

The ancestral stock of the Megapodini, as described above, has probably evolved from a *Dasypogonini*-like source (see Papavero, 1973a: 288-289). As to their geographical origin, two main alternatives may be considered:

1. The Megapodini appeared in one determined area (Africa; South America; one of the northern continents), spreading subsequently to other parts of the world;

2. The ancestral stock appeared in West Gondwana (Africa plus South America), after the breakup of India; later the Megapodini have spread to the northern continents.

I believe that the second alternative is more plausible. It does not require huge extinctions in the northern hemisphere to explain the absence of endemic Megapodini there and is supported by the morphological evidences: African and South American groups are clearly related,



Map 7, Geographical distribution of the *Pseudorus distendens*-group.

and present many primitive characters, while the northern Hemisphere is only invaded by a few, derived species.

I postulate for this group, therefore, a West Gondwanan origin. The group must have spread all over West Gondwana, during the Cretaceous, after the separation of India. According to Heirtzler et al. (1973) the initial opening of the Indian Ocean may be situated at the Tithonian age (or latest Jurassic), about 140 million years B. P.; India moved in a generally westerly direction for about 80 million years after rifting; Australia was attached to Antarctica until about 55 million years ago, at which time it started moving north and away from Antarctica (l. c., p. 954, note 11). On the other hand, Larson & Ladd (1973) place the initial opening of the South Atlantic in the Valanginian (early Cretaceous), or 125 to 130 million years B. P.

So, the age of spreading of the Megapodini may be situated at the Early Cretaceous.

The Megapodini have probably not entered Antarctica and Australia, although connections with South America may have existed during the Cretaceous and early Cenozoic (see Cracraft, 1973, pp. 468-469). This was probably due to ecological or geographical barriers.

The Megapodini were thus originally a typically forest-dwelling, exclusively Afro-South American group. After the opening of the Atlantic Ocean, with the separation of Africa and South America, the ancestral stock became separated on both sides of the Atlantic, following different evolutionary pathways, which shall be now considered.

### 8.3. EVOLUTION IN THE OLD WORLD

The original African ancestral stock of Megapodini evolved in the present subtribe Lagodiina. The main morphological modifications of the Lagodiina were: the body preserved the medium size or became larger and more robust; the pilosity and the bristles continued as in the ancestral stock or showed a strong tendency to increase; the face became more prominent throughout its extension and still more at the epistomal margin, presenting in lateral view a triangular profile; the mystax and the occiput tended to gradual reduction; the palpus maintained the primitive conditions, but in some species the apical pore of the second segment disappeared or became very reduced; in other species the basal segment of the palpus became reduced or absent; the proboscis became elongate; the vestiture of the mesonotum and scutellum of some species became greatly developed, while in the majority of the species it continued moderate, as in the ancestral stock; the legs preserved the primitive condition, or had their vestiture greatly modified and differentiated, to the point of forming a dense and compact fringe of long and flattened scales which cover the legs of males, as in *Lagodias teratodes* Hermann; a sexual dimorphism thus was developed; the basal callosity or plate of the anterior basitarsus became developed; the acrosticals have remained, whereas the lateral mesonotal bristles became reduced in number; in the wing all the cells remained open, except in a small group of species, where the anal cell became closed at the wing margin; in the male,

the hypandrium became robust, mammiform, and the bridge uniting the epandrium and the hypandrium became reinforced, wide and robust; neither the basistyli nor the dististyli suffered noticeable changes; the female terminalia maintained its primitive (spinous) condition.

The Lagodiina have originated two genera: *Lagodias* and *Pegesimallus*. The latter differ from the former by the non-rotated male genitalia, the strong pilosity of the mesonotum and scutellum, and by the anal cell, closed at the wing margin.

This group probably originated in the Congo forests, later invading the savannas of Africa, and finally specializing in the deserts and semi-deserts of South Africa, where *Lagodias* underwent a strong radiation. Adaptation to more or less narrow types of open formations brought the great number of species existing in South Africa. As pointed out by La Greca (1971: 13): "Le fractionnement des populations en Afrique et leur isolement est difficilement imputable à des événements géologiques ayant pu causer la formation de barrières géographiques efficaces et ayant duré assez longtemps pour déterminer l'isolement reproductif, fondement de la spéciation. La cause de cet isolement doit être recherchée dans un autre des facteurs importants qui contrôlent la distribution géographique des organismes, c'est-à-dire le facteur éco-éthologique."

Whether the primitive stock of *Lagodias* colonized Madagascar before or after its separation from the African continent, only a revision of the species of the genus can tell.

Colonization of the Palearctic region was only possible when species-groups of *Lagodias* became adapted to savannas and other open formations; these groups could then spread northwards, to Eurasia, passing thence to India and to the Malay Archipelago; they did not cross, however, Weber's Line. With the establishment of the Saharan Desert, the genus was segregated into two main areas: Africa south of the Sahara, and the southern portion of the Palearctic region (together with the Oriental region).

#### 8.4. EVOLUTION IN THE NEW WORLD

The ancestral Megapodini stock that became restricted to South America after the formation of the Atlantic Ocean preserved several primitive characters, but also underwent some modifications: the pilosity in general tended to reduce; the mystax also became very reduced; the acrosticals disappeared completely and the dorsocentrals became reduced, developed only in front of the scutellum; the 4th posterior and the anal cells became closed and petiolate.

This ancestral South American stock became very soon differentiated in three groups, which gave origin to the subtribes *Cyrtophryina*, *Senobasiina* and *Megapodina*.

Before considering the evolution of these subtribes, let's have a rapid look at the paleoecology of South America.

Cracraft (1973: 484-485) thus summarized our (scanty) knowledge of South American paleoecology and paleoclimatology:

“A large number of Mesozoic and Tertiary plant localities are known from many of the South American countries (Berry, 1938; Archangelsky, 1968), but most of these assemblages contain few species and thus are of limited value for arriving at precise interpretations of the paleoclimate. Nevertheless, some information regarding the general climatic trends for South America is available. Most of the information for what follows is taken from Berry’s (1938: 41-53) useful summary of Tertiary floras.”

“Very little is known of Cretaceous floras in South America. One can surmise that dense, lush forests probably covered much of the continent which had for the most part a uniform low relief. Axelrod (1970) believes that geological evidence (red bed, evaporite, and aeolian deposits) favours widespread hot, seasonally dry climates in parts of the Gondwana lowlands. With the opening of the Atlantic Ocean in the late Jurassic and Cretaceous, more moist and equable climates ensued thereby enabling the lowlands to be invaded by angiosperms which had their origins in the more equable uplands (Axelrod, 1970: 284-285). Because of the presence of tropical-subtropical forests over much of the earth in the Cretaceous, their presence in South America at this time seems a valid assumption.”

“Berry (1938) documents the presence of tropical wet forests over much of South America throughout the Tertiary (see also Gill, 1961: 350). The low relief of the Andes prior to the Miocene resulted in the spreading of these forests into areas that would later be subjected to a rain-shadow effect. Thus, because moisture from the Atlantic was not intercepted by high mountains, tropical forests were present along the coasts of Peru and Chile during the Eocene and Oligocene, areas that are now some of the driest in the world (Berry, 1938).”

“Berry (1938) discusses in detail the composition of a late Oligocene-early Miocene forest that covered probably most of southern Argentina and Chile. Several fossil localities in these two countries indicate

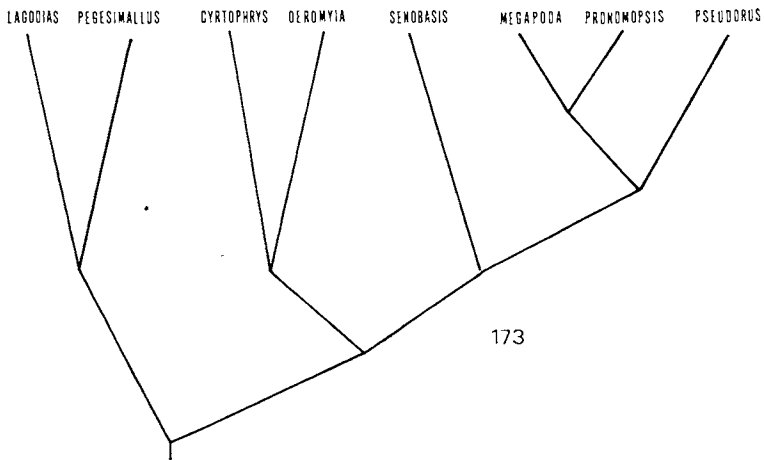


Fig. 173. Hypothetical phylogeny of the Megapodini genera.

that this area was heavily forested, because the species in the flora do not belong to savanna or scrub-forest associations. A large number of the genera are typically 'tropical' but others are 'temperate', and Berry (p. 23) concludes that most of the genera are 'mesophytic types but in no sense indicative of a rain forest'. In general, these floras seem to be suggestive of *at least* a warm-temperate, if not actual subtropical, climate. After study of the coniferous plants of southern South America, Florin (1940) concluded that the forest was of a warm temperate to subtropical rain forest (podocarps and evergreens) living in a humid equable climate. Because paleobotanical evidence seems to document synchronous worldwide temperate fluctuations during the Tertiary (Wolfe, 1971: 50-54), it might be assumed that Eocene-early Oligocene climates were even milder than those indicated by these late Oligocene-early Miocene forests."

"With the uplift of the Andes in the late Tertiary, the climate of South America was modified drastically. The area became drier and cooler, and eventually a grasslands (pampas) environment was attained."

"The fossil record (mammals) also suggests "a climate sufficiently genial to permit such now mainly tropical animals as porcupines, echimyids, dasyproctids, ant-eaters and primates to flourish there [Southern South America]. The molluscs of the Patagonian Miocene are in accord on this point. The environment suggested by the mammalian faunas throughout much of this stretch of time is a woodland and savanna one that graded northward into the rain forest, woodland, and savanna of the tropical zone, then no doubt more extensive than at present. We do not, of course, imply monotonous uniformity. Changes and fluctuations there undoubtedly were, but they occurred within this general environment. At the beginning of the Pliocene a change began in the southern part of the continent. The sedimentation center shifted from Patagonia to the Pampas region and to northwestern Argentina, and the sediments themselves changed from predominantly pyroclastic to predominantly clastic (Reig, 1957; Pascual, 1961, 1965). All of this coincided with a phase of Andean uplift that was to result in elevation of the Main Cordillera (Herrero-Ducloux, 1963). It had a marked ecological effect, largely by acting as a barrier to moisture-laden Pacific winds. The Pampas probably came into prominence at about this time, many of the subtropical savanna-woodland forms retreated northward, and new opportunities arose for those mammals able to adapt to a plains environment."

"As Simpson has stressed (1966), the Andes in their present form are a new addition to the South American scene. The last major uplift began at the end of the Tertiary, as is demonstrated by Montehermosan sediments which were involved in it (Riggs and Patterson, 1939). The enduring part of South America is and has been the great rain-forest — woodland — savanna complex that today embraces nearly all the tropical and subtropical portions of the continent east of the Andes. It was in this environment that the greater part of South American mammalian evolution probably took place. The area has always been large; there is no good evidence that epicontinental seas ever covered extensive parts of it during the Cenozoic." (Patterson & Pascual, 1972: 251-252).



8.4.1. *Evolution of the Cyrtophryina.* This was the first group to radiate in South America, having probably occupied the entire continent. This subtribe was very soon divided into main groups: one inhabiting the rain-forests of the tropical Guiano-Brazilian subregion, the second occupying the forests (mainly podocarps and evergreens) of warm-temperate Chile-Patagonian subregion. The first group originated the genus *Cyrtophrys*; the second the genus *Deromyia*.

*Cyrtophrys* is characterized by the long antennae, lacking an apical microsegment, with the antennal spine situated subapically or medianly on the dorsal surface of the 3rd antennal segment, by the total loss of the vestiture, which became very reduced, short and scanty; the frons became convex, bare and shining, the convexity prolonged posteriorly to the vertex, tapering towards the occipital foramen; males suffered a reduction in the number of abdominal tergites (7); the male hypandrium became triangular, elongate, projected between the gonopods; the female preserved the primitive condition of the terminalia, formed by segment 9 with spinous acanthophorites; the face remained plane, the palpus with 2 segments, the tergites with "bullae".

*Deromyia* maintained a great part of the primitive characters: face 1/3 width of head, antenna spindle-shaped, with well-developed style, abdominal tergites bullose, female terminalia with acanthophorites, males with 8 abdominal segments, marginal cell open.

*Cyrtophrys* is now restricted to the forests of southeastern and southern Brazil, and to coastal Venezuela. This group has probably receded, through competition with other Megapodini. *Deromyia* is now restricted to Chile, being probably eliminated from a much broader area (Patagonia) because of the formation of the Pampas, in the Upper Tertiary.

8.4.2. *Evolution of the Senobasiina.* The only genus belonging to this subtribe, *Senobasis*, is characterized by the narrow face, with pilosity restricted to the lower half; the face remained straight and plane in lateral view, as in the primitive stock, only slightly prominent at the epistomal margin; the antennae remained spindle-shaped, but the apical style disappeared; the palpus became reduced to one single segment, but in some species vestiges of the basal segment have remained; the 1st tergite preserved the primitive lateral bristles; in the male there occurred a reduction of the abdominal tergites (7 tergites present); the hypandrium preserved the primitive condition, short and triangular, or became elongate, prolonged between the gonopods, tongue-like; in the female terminalia there was a great change: the 9th tergite became modified into a plate, more or less triangular, totally different from the primitive acanthophorites existing in *Lagodias*, *Pegesimallus*, *Cyrtophrys* and *Deromyia*; the wing preserved the primitive venation, with marginal open, but the 4th posterior and anal cells became closed; the first abdominal tergites lost the bullae of the posterior margin.

*Senobasis* has probably always occupied the rain-forests of the Guiano-Brazilian region; it has probably appeared too late to have colonized

the Chileo-Patagonian subregion. Examination of the distribution of the different species-groups of this genus suggests that speciation in *Senobasis* was largely undergone during the Pliocene-Pleistocene climatic changes.

The patterns formed by the different species of *Senobasis* were already discussed.

From the works of Haffer (1969, 1970), Vanzolini & Williams (1970) and Vuillemier (1971) it is known that there was a series of climatic changes in South America, each one involving a dryer and a more humid phase, during the Pleistocene and Holocene. Vanzolini & Williams (1970: 95) suppose that "to the dry phases correspond enormous retreats of the rain forest of such an extent that the forest survives only in refugia separated by wide tracts of open formations. Alternately, in the wet phases forest spreads outward from the refugia separated by wide tracts of open formations. In the wet phases the species isolates that had differentiated in the refugia of the dry phases spread out along with the forest, meeting each other and interacting in various ways. In these extreme cases in which genetical isolation was achieved during the preceding dry phase interaction results in character displacement and thus further differentiation. In other cases, wherever a degree of genetic compatibility still exists, the result of interaction is extensive recombination with a great increase in variability which can be the raw material for a next phase of segregation."

From the papers cited above, several main ("Core") areas have been deduced as having served as "refugia". These are:

1. Caribe-Costa Rica;
2. Chocó (western Colombia);
3. Nechí (northwestern Colombia);
4. Catatumbo (northern Colombia);
5. Napo (lowlands of eastern Ecuador, from the Andes to the Marañón River);
6. Eastern Peru (several forest isolates of lowlands, along the Peruvian Andes and more to the east, in the mountains between the Ucayali River and the Juruá-Purus drainage);
7. Imeri (a small area around the Serra de Imeri and Cerro Neblina, between the headwaters of the Orinoco River and the Upper Rio Negro);
8. Madeira-Tapajós;
9. Guianas;
10. Belém (south of the mouth of the Amazons, to the lower Tocantins River to the west);
11. Coastal Venezuela;
12. Mato Grosso de Goiás;
13. Espírito Santo (Serra dos Aimorés);
14. Serra do Mar (coastal São Paulo).

Vanzolini & Williams (1970: 101-103), cite evidences in favor of the refugia along the Serra do Mar and in coastal Venezuela; Müller (1968) cites the Serra do Mar refugium.

Comparison between the refugia and the areas of distribution of *Senobasis* species-groups shows many remarkable coincidences:

1. *gyrophora*-group: *notata* (Bigot) occupies the Amazonian basin; it could have been formed in any of the two main Amazonian refugia: the Guianas, or Eastern Peru; *lanei* Carrera, *mundata* (Wiedemann), and *gyrophora* (Schiner) were probably formed in the Espírito Santo or Serra do Mar refugia; this was very probably a group that occurred all over the forests of the Guiano-Brazilian region, and became fragmented in several species during arid cycles; later on, the species increased their range;

2. the *claripennis*-group (*claripennis* (Schiner) and *apicalis* (Schiner) were also formed along the Serra do Mar refugia; later on, the two species increasing their areas of distribution, became sympatric in most of their range; it is to be noticed that, while very similar externally, they differ enormously in the male genitalia;

3. the *analisis*-group is also disjunct in the Guiano-Brazilian sub-region: *analisis* may have been formed in the Guianas refugium; *mendax* either in Eastern Peru or the Guianas; *corsair* probably in the Chocó refugium; *ornata* is very probably a species of the Espírito Santo (Serra dos Aimorés) refugium; finally, in this group, we have the pair *lenkoi*, sp.n.-*bromleyana* Carrera; this pair of species is characterized by the black tergites, with yellow hind margin; this pattern is very similar to the *claripennis*-group, and in fact all these species have been misidentified by some authors; the *bromleyana*-group developed then a very cha-

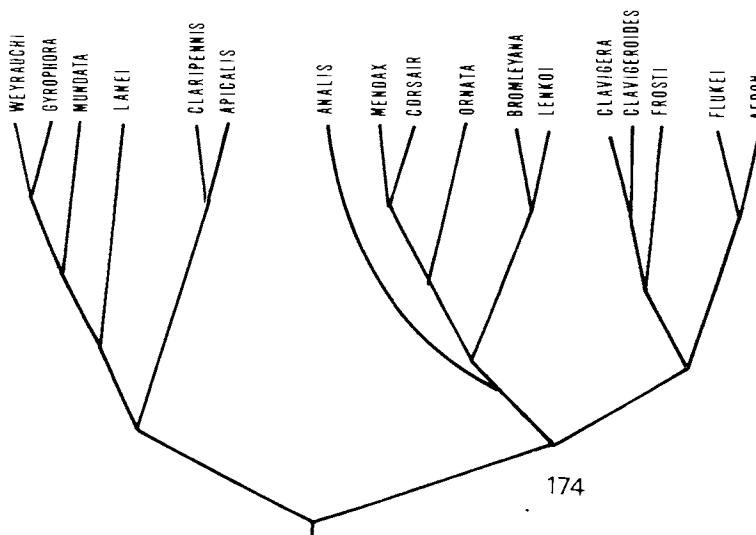


Fig. 174, Hypothetical phylogeny of the species of *Senobasis* [*weyrauchi* should be renamed *notata*].

racteristic feature to differentiate itself from the *claripennis*-group — a strongly developed lower face, prolonged into a beak or nose, very conspicuous; *bromleyana* was formed along the Serra do Mar refugia, and *lenkoi* in one of the Western Amazonia refugia;

4. the *clavigera*-group is entirely Trans-Andean: *flukei* and *clavigeroides* were probably formed in the Eastern Peru or Napo refugia; *aedon* and *clavigera* either in Coastal Venezuela or one of the refugia of Colombia (Chocó, Nechí, or Catatumbo), and *frosti* probably in the Caribe-Costa Rica refugium. This trans-Andean pattern of distribution is very typical of certain species-groups in South America, and very similar to that found by Vanzolini (1968: 90) for lizards of the genus *Gonatodes*; this pattern was called by Vanzolini "Northwestern Arch".

In short, the distribution of *Senobasis* shows that, basically, three main areas have served for speciation: two in the Amazonian basin (probably the largest areas, Guianas, and Eastern Peru), and one in the Serra do Mar region in southeastern Brazil. This agrees with other patterns shown by other groups of Asilidae (see Papavero & Bernardi, 1973, 1974). From these main areas, the species-groups invade the northwestern arch of South America, passing afterwards to Central America, and Mexico.

8.4.3. *Evolution of the Megapodina.* The third branch of the primitive South American Megapodini stock gave rise to the Subtribe Megapodina, the most derived group. They primitively should have an apical microsegment on the 3rd antennal segment, the pilosity of the face reduced, the face 1/3 of the width of head, very prominent as seen in lateral view or notoriously concave medianly, the palpus became reduced to only one segment, long, cylindrical and subsigmoid; there was a tendency to reduce the lateral bristles of tergite 1; the males had tergites reduced to 7, as the females, and the ovipositor was formed by tergite 8, and no longer by the 9th, as had until then happened with the other Megapodini; the proboscis became considerably long, the marginal cell became closed in some species, the hypandrium short with a pronounced median concavity; the first abdominal tergites lost the bullae on the posterior margin.

This group originated three genera: *Megapoda*, *Pronomopsis* and *Pseudorus*.

1. In the branch originating *Megapoda* the face became still narrower (1/4 of head's width), moderately prominent, triangular in lateral view; the median keel of the subepistomal area disappeared; the proboscis became exceptionally long and slender; the antennal style became partially fused to the 3rd antennal segment, subsisting only as a small lateral lappet; the mesonotum continued plane, very little convex, but anteriorly with a strong declivity; the scutellum became short, basally depressed, with only a few marginal hairs; the post-metacoxal area preserved the primitive (membraneous) condition; the legs became long and slender, the posterior femur very long, and the anterior basitarsus as long as the other 4 tarsomeres together; the marginal cell became closed; the lateral bristles of tergite 1 reduced to long and fine hairs,



Fig. 175, Hypothetical phylogeny of the species of *Pseudorus*.

those of tergite 2 remained, but were shortened; the male genitalia became large and conspicuous, rotated of  $180^\circ$ , with massive gonopods, with considerable width in lateral view, and a wide space between them; the aedeagus remained long, robust, but the apex presented a strong cleft; the female terminalia became short and cylindrical, slightly higher than wide.

*Megapoda* was probably formed in the forests of the Guiano-Brazilian area.

2. In the branch that originated *Pronomopsis* the face remained with  $1/3$  of the head's width, but became very prominent, prolonged into a curious beak, acute at apex, with a central yellow area, densely pollinose and bare, except at the periphery, and densely pilose around that yellow area; the frons presented longitudinal sulci; antennal style remained, although small; the proboscis became moderately long; the mesonotum remained slightly convex; the dorsocentrals became undifferentiated from the remaining mesonotal pile; the scutellum became short, the disc flattened, with a few sparse hairs; the legs became moderately robust, with short and thick bristles; in the wing the marginal cell became closed, as in *Megapoda*; the post-metacoxal area became only narrowly membranous; the abdomen became dorsoventrally compressed, and the lateral bristles of the first two tergites became long and erect bristly hairs; the male genitalia became similar to that of *Megapoda*, but the epandrium trapezoidal, the cerci with characteristic lateral processes, the basistyli with internal and external apical processes, and the aedeagus became transformed, with a well-developed apical "glans", with lateral spines; in the female the segment 8 formed a large, triangular body, dorsoventrally flattened, with both dorsal and ventral surfaces slightly convex.

*Pronomopsis* is very closely related to *Megapoda*, and has very probably appeared in the Upper Tertiary, when the Andes were already formed, since this genus is adapted to desertic areas of high altitude in Peru and northern Chile.

3. In the branch that originated *Pseudorus* the face maintained the primitive condition (1/3 of head's width), and also remained scarcely prominent, but became strongly concave medianly, projected inferiorly into a thick and short lip; the subepistomal area became very long and oblique; the proboscis very long, much longer than an eye's length; the antennal style became totally absent; the third antennal segment strongly rounded; the frons with longitudinal sulci; the mesonotum acquired a strong tendency to become more and more convex anteriorly, to the point of creating a pronounced gibbosity, that covers and entirely surpasses the head; the post-metacoxal area started a process of chitinization; the dorsocentrals remained, but became reduced; the scutellum became very short, fused to the mesonotum, with very scanty pilosity in some species, or totally bare in others; the legs suffered great modifications in some species; the wings have maintained the original open marginal cell in some species; in some other the marginal was closed; the first posterior cell became closed in one species; in some others a third submarginal cell appeared; the abdomen became short, with the lateral bristles of the first two tergites reduced to fine bristly hairs or totally absent; the male genitalia became similar to that of *Pronomopsis*, but the epandrium more trapezoidal, the hypandrium more deeply concave medianly, the dististyli developed, elongate, with a falciform apical portion; the aedeagus became more or less voluminous and bulbous below, surmounted by a relatively short cone; there was also partial fusion of the gonopods through a weakly sclerotized chitinous basal bridge; the female ovipositor, also formed by segment 8, became a triangular, dorsoventrally compressed plate, sometimes convex or upturned.

*Pseudorus* has also occupied at first the forests of the Guiano-Amazonian subregion, later invading Central America and Mexico.

8.4.4. *Speciation in Pseudorus*. As happens with *Senobasis*, the species of *Pseudorus* seem to have been formed in South American forest refugia:

1. *dimidiatus* Oldroyd in some of the main Amazonian refugia;
2. *holcocephalinus*, sp. n., along the Serra do Mar;
3. *dandrettæ* Carrera in the Serra do Mar;
4. *piceus*-group — also Serra do Mar;
5. *rufiventris* (Roeder) — probably Eastern Peru.

These groups probably were much more widespread before, some of them having colonized Mexico, which is now inhabited by two species: *martini*, sp. n. (*rufiventris*-group), and *bicolor* Bellardi.

The *distendens*-group, as already commented, is distributed all over the Neotropical region, *mexicanus* (Bromley) occupying the Sonoran Desert, and *distendens* (Wiedemann) the forests of the Neotropical Region.

8.4.5. *Abstract of evolutionary history* (Fig. 173). The ancestral Gondwanan stock was divided between South America and Africa. The African stock originated the Lagodiina, originally forest-dwelling, then adapted to open formations; through open formations the Lagodiina invaded the Palearctic and Oriental regions. In South America the original ancestral stock originated 3 subtribes: Cyrtophryina, Senobasiina and Megapodina. The Cyrtophryina were divided in two genera: one Guiano-Brazilian (*Cyrtophrys*), the other Chileo-Patagonian (*Deromyia*); with advent of the Pampas (Upper Tertiary) *Deromyia* became restricted to Chile. The Senobasiina and Megapodina occupied the Guiano-Brazilian forests, but not the Chileo-Patagonian subregion; of the latter subtribe, an offshoot (*Pronomopsis*) became established in high-altitudes deserts in Peru and Chile. Speciation in *Senobasis* and *Pseudorus* very probably resulted from isolation in forest refugia during Pleistocene-Holocene climatic changes.

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