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SYSTEMATIC REVISION OF THE NEOTROPICAL ANT GENUS *MEGALOMYRMEX* FOREL (HYMENOPTERA: FORMICIDAE: MYRMICINAE), WITH THE DESCRIPTION OF THIRTEEN NEW SPECIES

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ABSTRACT

This revision includes comparative morphological analysis, biological data from various sources and a consideration of geographical distributions. The genus is considered to be a natural group, including 31 valid species, of which 13 are here described as new. The species are distributed in four groups, morphologically and behaviorally characterized; individual keys and distributional maps are given. All types were examined, except for that of M. bituberculatus (Fabricius, 1798), probably lost; the species is considered inquirenda. M. duckei Forel, 1912 and M. leoninus var. nasutus Forel, 1912 are considered junior synonyms of, respectively, M. balzani Emery, 1894 and M. staudingeri Emery, 1890. The Modestus group comprises medium sized species that occupy or dig cavities under logs or rocks. Colonies may be large and may have one to several true queens. Workers forage in groups on the ground of tropical and subtropical forests, recruiting nestmates toward large food items. In the Modestus group are described as new M. ayri, M. caete and M. cupecuara. The Leoninus group comprises larger species, the gamergates of which take over the reproductive function. Nests occupy cavities under logs, with no traces of architecture. Workers forage individually on the ground or on shrubs, tending membracid nymphs. New species in this group are M. acauna, M. cyendyra, M. pacova and M. timbira. Species of the Silvestrii group maintain apparent non-obligatory lestoproct relationships with several genera of Attini. They occupy secondary cavities of the nests of their fungus-growing hosts and always have monogynous colonies with true queens. New in this group are M. cuatiara, M. mondabora, M. piriana, M. poatan and M. tasyba. The Pusillus group includes the smallest species of the genus, which live in general in diffuse colonies in the litter of tropical and subtropical forests. Some species may have colonies either with gamergates or with true queens. The shape of the mandibles and the relatively large eyes suggest predatory habits. M. miri is the only new species in the group. Lectotypes and paralectotypes are designated for M. balzani, M. foreli, M. goeldii, M. iheringi, M. latreillei, M. leoninus, M. modestus, M. myops, M. pusillus and M. symmetochus.

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INTRODUCTION

Megalomyrmex is restricted to the wet and subtropical forests of South and Central America. It belongs to a group of fairly well characterized genera of Myrmicinae, the most diversified subfamily of the Formicidae.

At present Myrmicinae corresponds to Emery's section Eumyrmicinae, defined in the *Genera Insectorum* (1922) as having pedicel with two segments (postpetiole always slenderer than the first basal segment of gaster), pupae not enclosed in cocoons, clypeus almost always produced between the frontal carinae (if not the

middle and hind tibial spurs are simple or absent) and ocelli not present in ordinary workers. For the Neotropics Kempf (1972) lists 80 genera of Myrmicinae, distributed in 14 tribes, with a total of 147 genera. The arrangement of genera currently adopted follows Emery (*op. cit.*), with the modifications suggested by Wheeler (1922a).

The tribe Solenopsidini, in which *Megalomyrmex* has been traditionally included, was erected by Forel (1893). The genera included (also those in the Pheidologetini) have been reviewed by Ettershank (1966), who suggested that these tribes, as usually defined, are artificial. He proposed a new classification, recommending the use of informal groups of genera, related respectively to *Monomorium*, *Megalomyrmex*, *Pheidologeton* and *Solenopsis*, and excluding a number of genera.

After Ettershank's proposal Kempf (1975) synonymized *Brownidris* Kusnezov with *Ochetomyrmex* Mayr, Snelling (1975) divided *Nothidris* Ettershank into *Nothidris* plus *Antichthonidris* and Bolton (1986) synonymized *Hagioxenus* Forel with *Rhoptromyrmex* Mayr (Tetramoriini).

Recently Bolton (1987) recombined these four generic groups into two sets. The *Pheidologeton* group lacks a differentiated median clypeal seta, while the fore wings of males and females have a closed radial cell, both characters considered plesiomorphic in relation to the other set, termed *Solenopsis* group, after its old genus. The latter group brings together Ettershank's *Monomorium*, *Megalomyrmex* and *Solenopsis* groups. *Ochetomyrmex* and *Tranopelta* are excluded from the *Solenopsis* group in the new concept. Bolton also included *Chelaner* and *Syllophopsis* as synonyms of *Monomorium* and reinstated as valid genera *Phacota* and *Bondroitia* (formerly cited as synonyms of, respectively, *Monomorium* and *Diplomorium*).

In the present concept the *Solenopsis* group includes thirteen genera and displays a world-wide distribution, with most species confined to tropical and subtropical regions. They are: *Monomorium*, *Solenopsis*, *Megalomyrmex*, *Oxyepocus*, *Allomerus*, *Carebarella*, *Nothidris*, *Antichthonidris*, *Anillomyrma*, *Bondroitia*, *Diplomorium*, *Epelysidris* and *Phacota*. In the Neotropical region are represented the first eight genera.

Though Bolton (*op. cit.*) agrees that investigation of the phylogenetic relationships among these genera is in a very incipient stage, he proposed that *Monomorium*, *Nothidris*, *Phacota*, *Megalomyrmex* and *Antichthonidris* could be separated as a subset characterized by fore coxae relatively not enlarged, mandible apices overlapping, subpetiolar process present, promesonotum at least partially convex, maxillary palp not geniculate, median clypeus relatively narrow, antennal insertions relatively close, antennal club segments not specialized, basal border of mandibles unarmed and median clypeus primitively bicarinate.

The species grouped with *Megalomyrmex* had been placed in the subgenera *Wheelerimyrmex* Mann (1922), *Cepobroticus* Wheeler (1925a) and *Megalomyrmex s.s.* M. R. Smith (1947) stated that attempts to divide the genus into subgenera (based mainly on the dentition of the mandibles, proportions of the antennal segments and body size) had not been satisfactory due to the high diversity of the associated forms. Etter-shank (1966) placed the subgenera into straight synonymy of *Megalomyrmex*, with which Kempf & Brown (1968) concurred.

Kempf (1970) discussed the taxonomic status of three species of the genus and described another three, but did not attempt a revision.

Previous to Kempf's (1972) catalog of Neotropical Formicidae, *Megalomyrmex* included 23 nominal species, already taking in consideration the extensive synonymy under *M. silvestrii* by Kempf & Brown (1968) and synonymy of *M. humilis* Borgmeier under *Pheidole gertrudae*, suggested by Kempf (1960). Snelling (1975) transferred *M. bicolor* to *Nothidris*.

I have examined most specimens of *Megalomyrmex* in museum collections, including types. Before that I worked on the terminology to be used studying the Museu de Zoologia collection.

Measurements are the routine ones in the group.

Cephalic indexes have not been used because head shape in *Megalomyrmex* is quite monotonous and could not be efficiently discriminated by indexes.

After listing all state characters for the recognized taxa I studied and figured in *camara-lucida* for comparison the mouth and venom apparatus

of the well known or well represented species. Unique types or species known from only a few individuals were not dissected (*M. emeryi*, *M. cupecuara*, *M. cyendyra*, *M. timbira*, *M. tasyba*, *M. mondabora* and *M. piriana*).

From the relatively few species with reproductives available I studied genitalia and wings.

During this study I reared colonies of 3 species, of which I also obtained biological field data.

All characters were studied to the level they could be used to distinguish among species or groups of species. Any of them could have been studied in more detail, but I was not interested in their variability, but rather in their discriminating power at each taxonomic level.

The taxonomic alterations accepted and proposed here, except for the newly described species are:

Original reference	Present situation
<i>Formica bituberculata</i> Fabricius, 1798	<i>species inquirenda</i>
<i>Megalomyrmex leoninus</i> Forel, 1884	type-species (by monotypy)
<i>Megalomyrmex foreli</i> Emery, 1890	<i>M. foreli</i>
<i>Megalomyrmex latreillei</i> Emery, 1890	<i>M. latreillei</i>
<i>Megalomyrmex staudingeri</i> Emery, 1890	<i>M. staudingeri</i>
<i>Megalomyrmex balzani</i> Emery, 1894	<i>M. balzani</i>
<i>Megalomyrmex modestus</i> Emery, 1896	<i>M. modestus</i>
<i>Megalomyrmex emeryi</i> Forel, 1904a	<i>M. emeryi</i>
<i>Megalomyrmex silvestrii</i> Wheeler, 1909	<i>M. silvestrii</i>
<i>Megalomyrmex iheringi</i> Forel, 1911	<i>M. iheringi</i>
<i>Megalomyrmex duckei</i> Forel, 1912	= <i>M. balzani</i> , n. syn.
<i>Megalomyrmex goeldii</i> Forel, 1912	<i>M. goeldii</i>
<i>M. leoninus</i> var. <i>nasutus</i> Forel, 1912	= <i>M. staudingeri</i> , n. syn.
<i>Megalomyrmex pusillus</i> Forel, 1912	<i>M. pusillus</i>
<i>Megalomyrmex wallacei</i> Mann, 1916	<i>M. wallacei</i>

Original reference	Present situation	Institute Royal des Sciences Naturelles de Belgique, Bruxelles (IRB), Dr. Paul Dessart Instituto Biológico, São Paulo (IB), Dra. Maria Aparecida Vulcano Instituto Nacional de Pesquisas da Amazonia, Manaus (INPA), Dra. Ana Y. Harada Museo Civico di Storia Naturale "Giacomo Doria", Genova (MGD), Dr. Roberto Poggi Museu Nacional do Rio de Janeiro, Rio de Janeiro (MNRJ), Dr. Cincinnato R. Gonçalves (deceased) Muséum National d'Histoire Naturelle, Paris (MNHN), Mme. J. Casevitz Weulersse Muséum d'Histoire Naturelle de la Ville de Genève, Genève (MVG), Dr. Claude Besuchet Museum of Comparative Zoology, Harvard University, Cambridge (MCZ), Dr. Edward O. Wilson National Museum of Natural History, Washington (NMNH), Dr. David R. Smith Naturhistorisches Museum Basel, Basel (NMB), Dr. Cesare Baroni Urbani Naturhistoriska Riksmuseet, Stockholm (RM), Dr. Peer Inge Person Collection Prof. Jorge L. M. Diniz (JLD), now in Bebedouro, São Paulo Collection Dr. Gary J. Umphrey (GJU), University of Guelph, Ontario
<i>M. (Wheelerimymex) myops</i> Santschi, 1925	<i>M. myops</i>	
<i>M. (Cepobroticus) symmetochus</i> Wheeler, 1925a	<i>M. symmetochus</i>	
<i>M. (W.) sjoestditi</i> Wheeler, 1925b	= <i>M. silvestrii</i>	
<i>M. (W.) sjoestditi</i> var. <i>langi</i> Wheller, 1925b	= <i>M. silvestrii</i>	
<i>M. (W.) humilis</i> Borgmeier, 1930	= <i>Pheidole gertrudae</i>	
<i>M. (W.) brasiliensis</i> Borgmeier, 1930	= <i>M. silvestrii</i>	
<i>M. (W.) brasiliensis</i> var. <i>misionensis</i> Sanstchi, 1936	= <i>M. silvestrii</i>	
<i>M. (C.) wheeleri</i> Weber, 1940	= <i>M. silvestrii</i>	
<i>M. (W.) incisus</i> M.R. Smith, 1947	<i>M. incisus</i>	
<i>Megalomyrmex drifti</i> Kempf, 1961	<i>M. drifti</i>	
<i>Megalomyrmex bicolor</i> Etter-shank, 1965	<i>Nothidris bicolor</i>	
<i>Megalomyrmex glaesarius</i> Kempf, 1970	<i>M. glaesarius</i>	
<i>Megalomyrmex gnomus</i> Kempf, 1970	<i>M. gnomus</i>	
<i>Megalomyrmex weyrauchi</i> Kempf, 1970	<i>M. weyrauchi</i>	

MATERIAL AND METHODS

The principal collection used, as well as the main repository for types series, was that of the Museu de Zoologia da Universidade de São Paulo (MZ), where the Borgmeier, Campos Seabra, Ihering, Kempf, Lenko and Luederwaldt collections are deposited.

During the course of this study, collections of *Megalomyrmex* from many sources have been handled, and series divided and redistributed to allow an efficient dispersal of duplicates. I acknowledge the curators listed below for the loan or gift of specimens. Abbreviations are used in the descriptive parts that follows.

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Types deposited in the Museu de Zoologia and those received as loans represented 22 of the 23 nominal species described under *Megalomyrmex*. I have also examined types from the species previously synonymized or transferred to other genera.

It was not possible to locate the types of *Formica bituberculata* described by Fabricius upon material collected by Bosc in Cayenne. According to Papavero (1971) and Horn & Kahle (1937) the specimens should be deposited in the Muséum National d'Histoire Naturelle, Paris; attempts to locate them failed.

Various bibliographical sources were used to identify locality records: Baumann & Reissinger (1969); Gazetteer of U.S. Board on Geographical Names (1955-1974); Index to Map of Hispanic America (American Geographical Society, 1945); Kempf (1961); Krishna & Araujo (1968); Lamas (1976); Lamas & Encar-

nación (1976); Litte (1981); Selander & Vaurie (1962); Vanzolini & Papavero (1968); Vaurie (1972).

I have adopted the terminology of Bolton (1976), Brown (1975, 1976), Brown & Nutting (1950), Ettershank (1966), Gotwald (1969), Gotwald & Kupiec (1978), Gotwald & Schaefer (1982), Kugler (1978), Taylor (1978), Wheeler (1910) and Wilson (1955). For the characterization of larvae I follow Wheeler & Wheeler (1976). Some terms, however, deserve special mention:

The literature on hymenopteran external morphology is not unambiguous on the concepts of notaulus, Mayrian and parapsidal sutures. I agree with Tulloch (1929, 1935) that regards the Mayrian suture, as adopted by Emery (1900), Wheeler (1910) and Matsuda (1976), and "convergierende Furchen", as adopted by Mayr (1861), as identical to notaulus.

For the translucent flanges located on either side of the petiole foramen I am here coining the term "posterior propodeal plates", in preference to "inferior propodeal plates", as used by Ettershank (1966).

To examine the mouth parts I heated the specimens to near boiling for 4-7 minute, which makes it possible to separate the mouth parts without injury to the head capsule. The pieces were then mounted for drawing on slides coated with Entellan (Merck).

In the study and terminology of the venom apparatus I follow Kugler (1978). For the genitalia I have adopted a procedure suggested by W.L. Brown Jr., subjecting the terminalia to a 10% solution of KOH for 5-7 hours after wetting the preparation for 18 hours. After washing the pieces to remove the muscles and fat with minute needles the genitalia were dehydrated in three changes of ethanol (70%, 80% and 90%) and transferred to glycerin for drawing.

For permanent mounts the preparations were returned to 96% ethanol and than transferred to a thin microscope slide with Entellan, set under a round window of 5 cm of diameter in a 1 x 2 cm piece of cardboard. Before the hardening of Entellan the whole preparation was covered with a similar piece of slide and the mount associated with the original specimen below the locality labels.

All measurements were taken with a micrometric ocular at 40 magnifications and recorded in millimeters.

Results are presented in 2 separated tables for each group. From primary types I obtained measurements for all characters listed below. Measurements of 4 characters (HL, HW, SL and WL) are presented for a sample of each species as intervals.

- HL - (Head length) - Distance in dorsal view from the occipital margin to the anterior border of clypeus.
- HW - (Head width) - maximum width in dorsal view, including compound eyes.
- ML - (Mandible length) - from the external corner of the base of the mandible to the tip of the apical tooth.
- SL - (Scape length) - excluding radicle.
- WL - (Weber's length of trunk) - distance between the base of anterior slope of pronotum and the end of the posterior propodeal plates.
- PL - (Petiolar length) - axial length of petiole in side view.
- PW - (petiolar width) - in dorsal view, at the spiracles.
- pPL - (Postpetiolar length) - in side view, from the posterior limit of the petiolar collar to limit of the gaster.
- pPW - (Postpetiolar width) - in dorsal view, at the spiracles.
- HfL - (Hind femora length) - axial length of hind femora, excluding eventual spines at the genual plates.
- GL - (Gaster length) - from posterior limit of postpetiolar collar to gaster apex.
- TL - (Total length) - sum of separate axial lengths of HL, ML, WL, PL, pPL and GL.

RESULTS

Megalomyrmex Forel, 1884: 371

= *Megalomyrmex* (*Wheelerimyrmex*) Mann, 1922:29; Ettershank, 1966:101

= *Megalomyrmex* (*Cepobroticus*) Wheeler, 1925a:168; Ettershank, 1966:101

Type of the genus: *Megalomyrmex leoninus* Fo-rel, 1884 (by monotypy).

Workers

For diagnosis of workers, definition and discussion of the group of genera that includes *Megalomyrmex* see Bolton (1987: 269-271). Total length 2-12mm. Basal area of mandibles with open *trulleum* and linear *mandalus*, *canthellus* not reaching the basal margin. Masticatory blade with 1 to 3 apical teeth. Dental formula 1+4, 2+n (n=5 to 12) or 3+3. Distal margin of labrum bilobed, longitudinal cleft more deeply excavated than in other genera of the group. Palpal formula 4:3, 3:2 or occasionally 3:1, without apparent fusion of segments. Prementum with 2 large setae at the center of the plate. Clypeus, in side view, divided in two regions by a square angle. Anterior portion with anterior border either straight or round, with or without a median denticle. Posterior region with median area prolonged between the frontal carinae. The anterior border of the posterior region may have up to four denticles, the inner ones leading to marked carinae, that marginate the central depression. Frontal carinae always present, may be parallel or divergent behind the antennal sockets. Frontal area sometimes indistinct. Frontal suture impressed in most species of the *Leoninus* and some species of the *Modestus* group.

Vertex angles round giving to the head capsule a round shape. Occipital margin raised or not; when raised may be visible in head frontal view.

Compound eyes with 5-25 ocular facets at largest diameter. The cavities that accommodate the eyes may be encircled by 1 or 2 concentric striations. Ocelli may occur in gamergates of the *Leoninus* and *Pusillus* groups, the anterior ocellus being always larger than the lateral ones, which may be vestigial.

Antennae always with 12 articles, clubbed. Scapes, laid back over the head, attaining at least the occipital border, but in general exceeding it. Scapes largest diameter at 7/10 of its length. First funicular joint equal in length to the second in the *Leoninus* group but at least twice the second in other groups. Antennal club with generally 3 segments, in cases with 4 or 5, the involved segments being always longer, but not necessarily broader than preceding ones (except for the *Pu-*

sillus group where clubbed segments are much broader and longer than ordinary ones).

Humeral pronotal angles always round. In dorsal view the pronotum is always the largest part of the trunk; it may exhibit a shallow median depression, separating two low inflated lateral areas (in the *Leoninus* group only). Promesonotal suture generally impressed laterally and dorsally, except in the *Silvestrii* group as a whole and in some species of other groups. When the suture is not impressed the dorsal profile of the pronotum is continuous. Contrariwise when impressed, the mesonotum may be higher than the pronotum. Mesoternum and metasternum may have acrotergites in form of paired sharpened teeth. Anepisternum and katepisternum, even when not clearly separated by sutures, distinguishable as low inflated areas posterior and lateral to the mesonotum.

Metanotal groove may be rather deep and sometimes marked by gross parallel rugosities from the dorsum to the pleural region, completely separating the katepisternum from the propodeum.

Propodeum generally with dorsal face clearly distinguished from declivity. Anterior margin of dorsal face may be elevated over the metanotal groove. In dorsal view this margin may also be notched, giving to it an ear-lobe aspect in side view. The entire propodeum dorsum may be strongly depressed, the depression suited to accommodate the pedicel when hold over the body. In side view this depression is not visible because of the lateral crests. At the declivity these lateral portions may be marked by carinae. Propodeum angles never dentate nor acuminate.

Declivity, seldom inconspicuous, may have concentric rugosities over the foramen encircling the epipetiolar carina. Posterior propodeal plates always round and translucent. Metapleural gland always well developed, with irregular rugosities over the bulla. Propodeum spiracles in general large, at times fitting in a low elevation, at an angle of 45° to the main axis of the body.

Petiole pedunculate or not. When pedunculate the node distinctly separated from the peduncle. Ventrally the petiole may bear a denticle anteriorly that may originate a longitudinal flange reaching the spiracle. Node always high and as large at the base as the peduncle. Dorsal border,

in frontal view, round with distinct apex or subquadrate with gentle dorso-lateral angles. In some species of the *Leoninus* group this border may present a shallow median notch, giving the node a cordiform aspect in frontal view. Posterior collar of petiole always striated.

Postpetiole never pedunculate. Node globose, generally lower and broader than the petiole. In some species of the *Pusillus* and *Silvestrii* groups the spiracles protrude laterally. The ventral face of the postpetiole may bear an acute tooth anteriorly and/or a round process posteriorly.

Anterior border of gaster straight or subtruncate in dorsal aspect. Venom apparatus with subquadrate spiracular plate (Fig. 127), with spiracle near the ventral margin. Anterior apodema less developed than in *Solenopsis*. Posterior tubercle obsolete. Quadrate plate similar with that of *Huberia* (Kugler, 1978, fig. 27) and anterior margin reduced. Anterior apodema more developed in the *Pusillus* group. Anal plate with 5-12 long setae at distal margin (Fig. 126). Oblong plate of the anterior arm with 3-4 intervolvifer sensillae. Subterminal tubercule low and obsolete. Anterior apodema narrow in side view.

Legs slender, unremarkable, with well developed spurs on middle and hind tibiae in the *Leoninus* and *Modestus* groups, but obsolete in the other groups. Apex of femora round in most species, but genual plates at times acuminate in species of the *Leoninus* group. Tarsal claws simple without arolia.

Sculpture

In general the body surface is smooth and shiny but may have rugose areas on the sides of clypeus, apex of katapisternum, metanotal groove, propodeum declivity and ventral face of petiole. Some species may also have striations around the antennal sockets, dorsally on the mandibles and petiole and postpetiole collars. *M. wallacei* (*Modestus* group) is the only species in the genus with most of the integument covered by gross punctures and non-oriented rugosities.

Pilosity

Clypeal set complete (in some individuals the median seta may be lacking, but its insertion is visible as a scar). In most species there are two kinds of hairs. Long hairs (comparable in size to

the diameter of compound eyes) occurring on frontal carinae, pronotum dorsum, dorsal border of petiole and postpetiole nodes and apex of gastric segments. Small hairs (size from .1 to .2 mm) occurring uniformly over the integument.

Queens

Always larger than respective workers. Anterior ocellus in general more developed than the lateral ones, which may be vestigial. Parapsidal sutures impressed on mesoscutum. Notaulus, when present, impressed only anteriorly. Queens may have only one type of hair and larger areas of striation than conspecific workers. Wing venation with discoidal cell always closed, M leaving Rm at r, m - cu always complete, cu - a reaches A in a square angle.

I have studied queens of the following species:

M. ayri, sp. n.; *M. caete*, sp. n.; *M. drifti*; *M. goeldii*; *M. iheringi*; *M. incisus*; *M. modestus*; *M. pusillus*; *M. silvestrii*; *M. symmetochus* and *M. wallacei*.

Males

Similar in size to conspecific workers. Clypeus always undivided and prolonged between the frontal carinae; the anterior border may have a median denticle and may have faintly impressed carinae. Mandibles always triangular striate and shiny, dental formula 1+3, seldom 1+4. Occipital margin straight with sharp lateral angles. 13-segmented antennae. Scape and pedicel in general with the same color as the head. Funicular segments may be swollen. Compound eyes bulging, larger than in conspecific workers with up to 30 ocular facets at largest diameter; always developed ocelli accommodated in a protrusion. Notaulus seldom present on the mesonotum, which always bears parapsidal sutures faintly impressed; propodeal faces in general indistinct in side view; declivity may have concentric rugosities over the foramen. Petiole always pedunculate with a low conic node, sometimes indistinct. Tarsal claws simple, without teeth. Apex of femora always round. Well developed cerci at the terminalia. Paramera round and well developed; spatulate volsellae. Wings of the *Solenopsis* type (Brown & Nutting, 1950), with A extending after cu-a till the discoidal cell. A meets cu-a in a

square angle. m-cu may be lacking and the discoidal cell may be open accordingly. Rs may have ramifications noted as Rs_1 and Rs_2 . Radial cell open, r may have adventitious short veins. At the posterior wings A may not extend after cu-a and M may not extend after r-m.

I have studied males of the following species:

M. balzani; *M. cupecuara*, sp. n.; *M. drifti*; *M. emeryi* (?); *M. foreli*; *M. glaesarius*; *M. goeldii*; *M. incisus*; *M. latreillei*; *M. leoninus*; *M. modestus*; *M. silvestrii* and *M. symmetochus*.

Larvae

Although I have at hand larvae of only 4 species of *Megalomyrmex*, some characters seem constant and may be used as a brief characterization. I include the description of *M. symmetochus* larvae (Wheeler & Wheeler, 1955), that I have not studied.

I have studied larvae of the following species:

M. ayri, sp. n.; *M. balzani*; *M. iheringi* and *M. silvestrii*.

Profile pogonomymecoid (*M. balzani*) to pheidoloid (all other species and *M. symmetochus*). Subhexagonal head with smooth hairs (kind 1A1 in Wheeler & Wheeler, 1976) unbranched, slightly curved or straight; antennae of the usual type not elevated; bilobed labrum in all species but in *M. balzani* (round); mandibles pheidoloid or ectatommoid (in *M. symmetochus*); galea and lacinia lobose (paraboloid in Wheeler & Wheeler, 1955); maxillary palp longer than galea, ventral face of abdomen without gonopods or leg vestiges. Spiracles with simple atrial wall.

Anchor tipped hairs (kind 1A4 of Wheelers) at the posterior end of the dorsum. Unbranched tip denticulate (kind 1B4) at the posterolateral portion of the ventral face.

In *M. balzani* there is a protuberance shaped as a subcone, better classified as a frustum with an apical hair not capitate in Wheeler's nomenclature.

DISCUSSION

Megalomyrmex is clearly a natural group and can be separated from all other myrmecines by the monomorphic workers with mandibles with,

at least, 5 teeth, palpal formula 4:3, 3:2 or, rarely, 3:1.

Nothidris (*sensu* Snelling, 1975) shows strong affinities with *Megalomyrmex*, but can be readily distinguished by the presence of soldiers (without intermediates) and the lack of a carina connecting the posterior plates of the propodeum in ordinary workers. *Nothidris* queens present petiole broader than the postpetiole and forewings with open discoidal cell (m-cu not complete). *Nothidris* has a transandean distribution.

I follow the synonymy of subgenera proposed by Ettershank (1966), who found some reality, however, in the species groups suggested earlier.

The subgenus *Wheelerimymex* included free-living as well as lestoproct species, grouping various patterns of mandible dentition, venon apparatus and mouth parts. *Cepobroticus* included 2 species lestoproct on Attini nests. The remaining species, classified in *Megalomyrmex sensu stritu*, were grouped without discussion of affinities.

I was not able to find in the literature any formal proposal of species groups in *Megalomyrmex*. Some authors suggested relationships among species, but the first unequivocal reference to species groups is that of Ettershank (1966). I do not agree, however, with the groups proposed by him. For instance, *M. modestus* (*modestus* group of Ettershank) exhibits all characters used by Ettershank to define his *goeldii* group.

My results indicate that the species of *Megalomyrmex* can be divided in four groups, characterized morphologically and behaviorally. I present below a key for the identification of these species groups, followed by the characterization of each group and a systematic treatment of all species.

I present diagnoses for all castes of all species, except when males or queens have already been properly described. Species described here as new receive the same treatment.

Key for the identification of *Megalomyrmex* species groups (workers)

- 1) A. Dental formula 1 + 4; palpal formula 4:3 2
- B. Mandibles with 2 or 3 apical teeth, palpal formula 4:3, 3:2, 3:1 (except *M. pusillus*, SE Brasil, *Pusillus* group, see Figs. 122-124) 3

- 2) A. WL less than 2.00 mm; first funicular segment at least twice as long as the second; eyes with 10-13 facets at the largest diameter (except *M. wallacei* with 20, sole species with superficial sculpture on at least the interocular region and vertex)....
.....Modestus group
- B. WL more than 2.10 mm; first funicular segment not twice as big as the second; eye with at least 15 ocular facets at the largest diameter.....Leoninus group
- 3) A. Club segments broader, but not much, than the other funicular segments; apex of venom apparatus not spatulate but marked with a circular area of very small spines; palpal formula 4:3 or 3:2.....
.....Silvestrii group
- B. Club segments much broader and longer than the other funicular segments; apex of venom apparatus spatulate, not spiny; palpal formula 3:2 or 3:1.....
.....Pusillus group

Modestus group

Megalomyrmex ayri, sp.n.
Megalomyrmex caete, sp. n.
Megalomyrmex cupecuara, sp.n.
Megalomyrmex goeldii
Megalomyrmex iheringi
Megalomyrmex modestus
Megalomyrmex wallacei
Megalomyrmex weyrauchi

Worker diagnosis

WL between 1.15 and 2.00 mm; monomorphic; mandibles triangular with dental formula 1 + 4; palpal formula 4:3 (Fig. 34); clypeus sometimes depressed medially, but never carinate; first funicular segment twice as long as the second (Fig. 32); club with 3 or 4 segments, segments bigger but not much broader than the ordinary segments; compound eyes with 10-13 ocular facets (except for *M. wallacei* with 20) that, in general, do not interrupt the lateral margin of head in full frontal view; pronotum never impressed medially; epipetiolar carina always complete over the foramen; apex of femora round, apex of venom apparatus as in Fig. 31.

Morphologically, workers of *M. iheringi* and *M. wallacei* form a subgroup within the Modestus group, distinguished by head shape (Figs. 14-15), primary allometry and size (see Table 1). *M. wallacei* shows some derived characters in relation to the other species included, such as superficial sculpture recovering at least part of the tegument and eyes with relatively numerous ocular facets.

Members of the Modestus group live in colonies relatively numerous and sometimes polygynous, always with true queens (in two species only workers are known), that occupy or dig cavities under stones or logs or inhabit hollow twigs. In general nests are not rigidly constructed, but may show definite entrances and chambers. All species inhabit tropical and subtropical forests of South and Central America, occurring in the occidental portion of the Amazon and in southeast Brasil.

M. iheringi is known only from the top of the Serra do Mar, São Paulo state, and occurs sympatrically with *M. goeldii* in at least one locality (Estação Biológica de Boracéia, Mun. Salesópolis). The station is one of the best known localities from the viewpoint of the mirmecofauna. *M. iheringi* is rather common there while *M. goeldii* has been collected only once. Coming down to sea level, *M. goeldii* replaces *M. iheringi* and can be very abundant. In Petrópolis, state of Rio de Janeiro, *M. goeldii* is rather common. On the Atlantic coast *M. goeldii* is known from Barra de Maricá, Rio de Janeiro, to Barra do Una, São Paulo; it has been collected as Serra da Mantiqueira, Serra de Itatiaia (2300m) to the southeast of Minas Gerais (between Varginha and Viçosa).

M. modestus occurs in Central America and along the Cauca River, a distribution similar to that of *M. foreli* of the Leoninus group (see page 428).

M. wallacei is known from various localities in west central Amazon, being relatively common around Manaus. Unfortunately nothing is known of its biology. *M. weyrauchi* has the same distribution as *M. glaesarius*, of the Leoninus group.

Megalomyrmex ayri, sp. n. occurs on the transitional belt between the cerrados and the Amazon forest at the north of Mato Grosso, Brasil.

M. caete, sp. n., and *M. cupecuara*, sp. n., show a transandean distribution in forests.

The species assembled in the *Modestus* group show the largest number of characters I consider generalized, specially with reference to the palpal formula and the venom apparatus. Also they consistently have true queens and recruitment among workers, conditions commonly found among the myrmicine genera previously included in the *Solenopsidini*.

Key to species (workers) in the *Modestus* group

- 1) A. Dorsal face of mandibles longitudinally striate; antennal club with 3-4 segments 2
 - B. Dorsal face of mandibles smooth; antennal club always with 3 segments 3
- 2) A. Anterior border of clypeus round with median denticle; 4-segmented antennal club; circa 10 ocular facets at largest eyes diameter; occipital margin not visible in head frontal view; promesonotum suture not impressed; mesosternum and metasternum with sharp teeth; propodeum declivity smooth; pedunculate petiole with laterally produced spiracles and anteroventral denticle, but without a ventral translucent flange; $WL < 1.45\text{mm}$ *M. modestus*
 - B. Clypeal anterior border straight without median denticle; 3-segmented club; circa 20 ocular facets at eyes largest diameter; occipital margin conspicuous in head frontal view; promesonotum suture impressed; mesosternum and metasternum without ventral processes; propodeum declivity with concentric rugulae; non-pedunculate petiole without anteroventral denticle, but with a ventral longitudinal translucent flange; $WL > 1.68\text{mm}$ *M. wallacei*
- 3) A. Promesonotum suture not impressed on thorax dorsum. Laterally this suture may be visible, but it is obsolete on the dorsum, giving to the promesonotum a continuous dorsal profile in lateral view 4
 - B. Promesonotum suture impressed dorsally 6
- 4) A. Small species ($WL < 1.35\text{mm}$); entire body bright-yellow or light-brown with yellow legs 5

- B. $WL > 1.45\text{mm}$; dark brown, almost black species *M. weyrauchi*
- 5) A. Head subquadrate; anepisternum separated from katepisternum by a suture; propodeum declivity with only 1 rugosity surrounding the foramen; ventral face of petiole with a translucent longitudinal flange *M. ayri*, sp. n.
 - B. Head round; anepisternum and katepisternum not separated by sutures; propodeum declivity with 3 concentric rugosities encompassing the foramen; ventral face of petiole without longitudinal flange *M. caete*, sp. n.
- 6) A. Frontal suture impressed; dorsal face of propodeum transversally depressed in lateral view; $WL > 1.98\text{mm}$ *M. cupecuara*, sp. n.
 - B. Frontal suture not impressed; dorsal face of propodeum with a continuous profile in lateral view; $WL < 1.75\text{mm}$ 7
- 7) A. Anterior clypeal border round with median denticle; ventral face of petiole without denticle nor longitudinal flange; ventral face of postpetiole with a round process *M. goeldii*
 - B. Anterior clypeal border straight without median denticle; ventral face of petiole with an anterior denticle leading to a longitudinal flange; ventral face of postpetiole without processes *M. iheringi*

***Megalomyrmex ayri*, sp. n.**

(Figs. 1, 12, 26, 36)

Megalomyrmex ayri, sp. n., ♀. ♀. Type Loc.: Utiariti, Rio Papagaio, MT, Brasil ($13^{\circ} 02'S$, $58^{\circ} 17'W$). Holotype and 20 paratypes; Faz. Junqueira Vilela, munic. Diamantino, MT, Brasil ($14^{\circ} 25'S$, $56^{\circ} 26'W$), 10 paratypes; Sinop, MT, Brasil ($12^{\circ} 31'S$, $55^{\circ} 37'W$), 3 paratypes; Vilhena, RO, Brasil ($12^{\circ} 43'S$, $60^{\circ} 07'W$), 29 paratypes.

Types

Holotype (♀) and 11 paratypes (1 ♀, 10 ♀) from Utiariti, 3 paratypes (♀) from Sinop, 6 (1 ♀, 5 ♀) from Junqueira Vilela and 10 (2 ♀, 8 ♀) from Vilhena at Museu de Zoologia da USP;

Table 1. Measurements of *Megalomyrmex* of the Modestus group (in mm) - Types

♀ holotype or lectotype	HW	HL	ML	SL	WL	PL	PW	pPL	pPW	HFL	GL	TL
<i>M. ayri</i> , sp. n. holotype	.78	.88	.45	.95	1.18	.48	.25	.25	.33	1.08	1.05	4.29
<i>M. caete</i> , sp. n. holotype	.83	.93	.48	.98	1.25	.56	.23	.25	.28	1.20	1.40	4.87
<i>M. cupecuara</i> , sp. n. holotype	1.15	1.35	.73	1.90	1.98	.60	.25	.44	.33	2.10	1.75	6.85
<i>M. goeldii</i> lectotype	.86	1.03	.44	1.23	1.33	.53	.36	.20	.35	1.28	1.43	4.96
<i>M. iheringi</i> lectotype	1.08	1.20	.65	1.38	1.65	.70	.38	.28	.40	1.38	1.95	6.43
<i>M. modestus</i> lectotype	.90	1.08	.53	1.10	1.40	.55	.28	.30	.33	1.38	1.25	5.11
<i>M. weyrauchi</i> holotype	1.08	1.20	.63	1.18	1.55	.55	.38	.28	.43	1.35	1.55	5.76

Table 2. Measurements of *Megalomyrmex* of the Modestus group (in mm).

♀	N	HW	HL	SL	WL
<i>M. ayri</i> , sp. n. paratypes	35	.73- .80	.85- .93	.90-1.00	1.15-1.30
<i>M. caete</i> , sp. n. paratypes	5	.83- .88	.83- .88	.90-1.05	1.18-1.35
<i>M. cupecuara</i> , sp. n. Holotype + paratypes	4	1.13-1.20	1.33-1.40	1.83-1.90	1.98-2.10
<i>M. goeldii</i> several localities	30	.78- .86	.86-1.03	1.05-1.23	1.25-1.33
<i>M. iheringi</i> several localities	30	.93-1.20	1.03-1.25	1.28-1.45	1.45-1.75
<i>M. modestus</i> all workers examined	13	.81- .93	1.00-1.12	1.02-1.12	1.29-1.45
<i>M. wallacei</i> excluding, Abunã, RO, Brasil	30	.98-1.03	1.13-1.18	1.50-1.58	1.78-1.85
<i>M. wallacei</i> Abunã, RO, Brasil	3	.98-1.03	1.15-1.18	1.40-1.48	1.68-1.78
<i>M. weyrauchi</i> paratypes	27	1.00-1.14	1.13-1.27	1.13-1.24	1.45-1.65

4 paratypes (♂) from Utiariti, 2 (♂) from Junqueira Vilela and 2 (♂) from Vilhena at British Museum of Natural History; 5 paratypes (♂) from Utiariti, 2 (♂) from Junqueira Vilela and 3 (♂) from Vilhena at Museum of Comparative Zoology; 14 paratypes (2 ♀, 12 ♂) from Vilhena at Instituto Nacional de Pesquisas da Amazonia, Manaus.

Worker

Mandibles smooth, clypeus with concave anterior border between the feeble carinae, that delimit a median depression; promesonotal suture impressed dorsally; faces of propodeum meeting in a gentle angle; declivity either smooth or with one rugosity around the foramen; ventral face of petiole with anterior denticle and a longitudinal translucent flange; dorsal margin of petiolar node slope straight in side view; ventral face of postpetiole with a small globose process.

Pilosity: Long hairs (more than .2mm) all over the body surface; except mandibles, legs and posterior faces of petiole and postpetiole. Small hairs (ca. .1mm) at mandibles, legs and head.

Color: yellowish-brown.

Queen

Mandibles finely striate; ocelli equally developed; notaulus and parapsidal sutures impressed; dorsal face and declivity of propodeum meeting by means of lateral tubercles confining a shallow median depression; postpetiole with laterally produced spiracles and ventral face with rugosities at its posterior end.

Pilosity: Only long hairs (same as workers) more profuse than in conspecific workers.

Comments

Kempf already noticed that the specimens collected in Utiariti might belong to a new species. Accordingly he labelled them as: "*Megalomyrmex* pr. *goeldii*, talvez n. sp., W.W. Kempf det."

The specimens collected by W. L. Brown Jr. at Faz. Junqueira Vilela came from a nest collected at 3 km east of the farm house in the forest.

The paratypes from Vilhena came from a polygynous colony found by Dra. Ana Harada within the litter near a small stream in the forest.

Workers from *M. goeldii* and *M. ayri*, sp. n., are very similar, but the shape of the clypeus and size clearly separate them. Queens are more diverse and can be distinguished by the ocelli (only the anterior one is developed in *M. goeldii*) and by the given measurements.

The name *ayri* means small in Tupi, referring to the workers of this species, relatively smaller than *M. goeldii* workers.

Megalomyrmex caete, sp. n.

(Figs. 2, 9, 27)

Megalomyrmex caete, sp. n. ♂. ♀. Type Loc.: 3 Km SW Bucay, prov. Guayas, Ecuador (02° 10'S, 79° 06'W).

Types

Holotype (♂) and 2 paratypes (♂) at Museum of Comparative Zoology, Harvard Univ.; 1 paratype (♂) at British Museum of Natural History; 2 paratypes (♀ and ♂) at Museu de Zoologia da USP.

Worker

Mandibles smooth; anterior border of clypeus with median denticle; flat median area of clypeus limited by carinae (better seen at 80x); 3-segmented antennal club; 10-12 ocular facets at eye largest diameter; occipital margin not raised; dorsal profile of promesonotum continuous, promesonotum suture impressed laterally; mesosternum and metasternum without acrotergites; dorsal face and declivity of propodeum meeting in a gentle angle; declivity with 3-4 concentric rugosities over the foramen; petiole with anteroventral denticle; petiolar node, in frontal view, acuminate; postpetiole ventral process globose.

Pilosity: 6 long erect hairs (more than .2mm) at pronotum, 4-6 at the apex of petiole and postpetiole, 15-16 at the gaster segments and anterior face of fore coxae. Small subdecumbent hairs (circa .1mm) uniformly distributed over the body surface.

Color: uniform bright light-yellow.

Queen

Clypeal carinae only at the posterior region of clypeus; ocelli equally developed; parapsidal su-

tures impressed on mesonotum; scutum and scutellum with 2 parallel rows of long hairs; ventral process of postpetiole acuminate.

Comments

The type series has been collected by W.L. Brown Jr. in July, 24, 1973 at "mt. base, forest".

From one of the paratypes deposited at the Museu de Zoologia da USP I dissected the mouth apparatus. From this specimen I did not take cephalic measurements, except for the mandibles.

Caete means forest in Tupi.

Megalomyrmex cupecuara, sp.n.

(Figs. 3, 11, 21, 22, 23)

Megalomyrmex cupecuara, sp.n., ♀, ♂. Type Loc.: Anchicaya, munic. Buenaventura, Depto. Valle del Cauca, Colombia (03° 39'N, 76° 56'W), holotype and 7 paratypes (3 ♀, 4 ♂); 4Km E Sabaletos, Depto. Valle del Cauca, Colombia (03° 48'N, 76° 38'W), 1 paratype (♂); Tinalandia, 16Km SE S. Domingo de los Colorados, prov. Pichincha, Ecuador (00° 48'N, 76° 38'W), 3 paratypes (♂).

Types

Holotype (♀), 2 paratypes (♂) of Anchicaya and 1 paratype (♂) from Tinalandia at Museum of Comparative Zoology, Harvard; 5 paratypes (3 ♀ and 2 ♂) from Anchicaya, 1 ♂ from Sabaletos and 1 ♂ from Tinalandia at Museu de Zoologia da USP; paratype (♂) from Tinalandia at Facultad de Agronomía de Maracay, Venezuela.

Worker

Mandibles smooth; anterior border of clypeus round, without median denticle, carinae or median depression; frontal suture impressed; ca. 13 ocular facets at eye largest diameter; occipital margin not raised; 3-segmented club; promesonotal suture impressed dorsally interrupting the dorsal profile; mesosternum and metasternum without acrotergites; dorsal face and declivity of propodeum meeting in lateral tubercles, which delimit a median longitudinal depression; dorsal face transversally depressed (in side view); declivity smooth; dorsal anterior margin of petiole concave; dorsal margin of petiolar node, in fron-

tal view, round; ventral face of petiole with anteromedian denticle, without flange; ventral process of postpetiole globose.

Pilosity: suberect hairs (length from .2 to .5mm) uniformly distributed over the entire body surface.

Color: antennae and legs light-yellow, body brown.

Male

First funicular segment larger than scape and other funicular segments; notaulus and parapsidal sutures impressed (although some specimens may have these sutures faintly impressed); dorsal margin of propodeum transversally depressed; declivity smooth; epipetiolar carina complete; petiolar node globose; postpetiole larger and lower than the petiole, without ventral process.

Comments

M. cupecuara, sp. n., can be readily distinguished from all other species of *Megalomyrmex* by its transversally depressed propodeum. Accordingly this species received the name cupecuara, "cupe" meaning a hole (in the sense of a depression) at the "cuara" - back (dorsum) in Tupi. The types from Anchicaya have been collected by W. L. Brown Jr. between 17 and 19 of July in 1971. The specimens were found associated in pairs in each pin, a male and a worker, suggesting that they been collected in the same nest. The Museum of Comparative Zoology collection houses 12 more specimens from this sample (7 workers and 5 males).

The males from Tinalandia, collected by the Peck couple in June, 1975 and the male from Sabaletos, collected by R. C. Wilkerson in October, 10, 1975, are distinctly larger than the Anchicaya males. The genitalia preparations, however, indicate that they are conspecific.

Litte (1981) describes Anchicaya as "montane rain forest from 200 to 2000m, mean temperature 24°, anual rainfall ca. 2000mm, climate aseasonal".

Megalomyrmex goeldii

(Figs. 4, 10, 18, 24, 29, 31-34)

Megalomyrmex goeldii Forel, 1912: 14-16, ♀. Type Loc.: Colonia Alpina (munic. Teresópolis)

lis), RJ, Brasil (22° 26'S, 42° 59'W). Wheeler, 1925a: 29-30, ♂. Borgmeier, 1930: 34, ♀.

Lectotype designation

Lectotype and paralectotype Museum de la Ville de Genève, paralectotype Naturhistorisches Museum Basel, paralectotype Museu de Zoologia USP.

Worker

Mandibles smooth; clypeus not carinate with anteromedium denticle; frontal suture not impressed; 3-segmented antennal club; occipital margin not raised; pronotal elevation low, promesonotal suture faintly impressed dorsally; mesosternum and metasternum without ventral processes; dorsal face and declivity of propodeum meeting in smooth angle; declivity smooth; ventral face of petiole in general not denticulate nor laminate; postpetiole ventral face with a round and not very prominent process.

Pilosity: long hairs (ca. .2mm) at clypeus, frontal carina, vertex, dorsal faces of petiolar and postpetiolar nodes and gaster apex. Small hairs (ca. 1mm) at mandibles, antennae, sides of head, legs and basal segments of gaster.

Color: uniformly shiny yellow-brown, mandible teeth brown.

Comments

Non-type specimens may present the lateral portions of clypeus and antennal sockets faintly sculptured. Also some individuals present a long, narrow and translucent flange at the ventral face of petiole enclosing or not at its anterior end a small denticle. Specimens from Varginha and Santos Dumont (MG, Brasil) always present the anterior denticle, while in other localities this may be wanting. At the southern end of *M. goeldii* distribution (state of São Paulo) the epipetiolar carina is not complete over the foramen. Workers from Petrópolis have the sparser pilosity from all samples.

To Wheeler's original description of *M. goeldii* males I should add that the scape is slightly shorter than the head capsule, the mesonotum does not have notaulus nor parapsidal sutures and the epipetiolar carina is not complete over the foramen. Rs and Mf3 are well developed (called branches of *cubitus* by Wheeler).

Borgmeier (1930) described the female caste from a specimen collected among rotten leaves in Petrópolis, RJ, Brasil. I compared this specimens with the other 5 available and noticed that in all of them the posterior ocelli are vestigial, the mesonotum has no impression at all and the dorsal face of the propodeum is longitudinally depressed. A queen from Redenção da Serra, SP, Brasil presents a flange ventral to be petiole but no denticle nor the acute tooth under the postpetiole, which might be abroded.

Ettershank (1966, fig. 47) figure of female's wings, although identical to the male wings I have in hand, may not belong to this species, as the specimen he figured came from Manaus, a locality farther north from the known distribution of *M. goeldii*.

With the assistance of Jorge Diniz I collected 4 colonies of *M. goeldii* in Petrópolis under stones, within rotten logs and litter. Population sizes ranged from 300-400 workers, 1 to 4 dealate queens and all stages of immatures.

Material examined: BRASIL: *Minas Gerais*: Faz. Mantiqueira, Santos Dumont, 2 ♀ (JMD); 2 ♀ (MZ); Varginha 1 ♀ (MZ); Viçosa 30 ♀ (MZ), 7 ♀ (MCZ); 6 ♀ (BM); 4 ♀ (MVG); 2 ♀ (MNH); 3 ♀ (MGD); 2 ♀ (NMNH). *Rio de Janeiro*: Angra dos Reis 1 ♂ (MZ); Barra de Maricá 2 ♀ (MZ); Colônia Alpina (Teresópolis) 2 ♀ (MGV-types), 1 ♀ (NMB-type), 1 ♀ (MZ-type); Floresta da Tijuca 6 ♀ (MZ); Itatiaia 14 ♀ (MZ), 6 ♀ (MCZ), 3 ♀ (NMNH); Nogueira, Petrópolis, 9 ♀, 1 ♂, 3 ♀ (MZ), 3 ♀ (IB), 1 ♂, 2 ♀, 6 ♀ (MCZ), 3 ♀ (JLD); Represa Rio Grande 1 ♀ (MZ); Rio de Janeiro, 2 ♀ (MZ). *São Paulo*: Barra do Una 9 ♀ (MZ), 1 ♀ (MCZ); Caraguatatuba 6 ♀ (MZ); Horto Florestal (S.Paulo) 2 ♀ (MZ); Redenção da Serra 1 ♀, 11 ♀ (MZ), 3 ♀ (MCZ); Estação Biológica de Borocéia, município de Salesópolis 1 ♀ (MZ).

Megalomyrmex iheringi

(Figs. 5, 15, 28, 35)

Megalomyrmex iheringi Forel, 1911: 304-305, ♀.

Type Loc.: Parque Cajuru, Alto da Serra (município de Paranapiacaba), SP, Brasil (23° 47'S, 46° 19'W). Borgmeier, 1930: 33-34, est. 5, figs. 29-32, ♀.

Lectotype designation

Lectotype (Alto da Serra) and 14 paralectotypes (10 from Alto da Serra and 4 from Parque Cajuru) at Museu de Zoologia da USP; 1 paralectotype (Alto da Serra) at Museu Nacional do Rio de Janeiro; 3 paralectotypes (Alto da Serra) at Muséum de la Ville de Genève.

Worker

Mandibles smooth; clypeus not carinate, with anterior margin round, not denticulate; frontal suture not impressed; club with 3 segments; occipital margin raised but not visible in frontal view; dorsal pronotal profile continuous: promesonotal suture impressed dorsally; mesosternum and metasternum without ventral processes; dorsal face and declivity of propodeum meeting laterally in an obtuse angle, dorsal face faintly impressed medially; declivity without rugosities; ventral face of petiole with anterior denticle; postpetiole without ventral process.

Pilosity: small suberect hairs (ca. .1mm) uniformly covering antennae, head capsule, mandibles, legs, anterior face of petiole and postpetiole nodes and gaster. Long hairs (ca. .2mm) at thorax dorsum and apex of petiole and postpetiole nodes.

Color: uniformly bright reddish-brown.

Comments

M. iheringi is known only from localities above 800m at Serra do Mar, in the vicinity of the city of São Paulo.

Borgmeier (1930) pointed out some inaccuracies in Forel's original description, specially as to the raised margin of vertex. Furthermore, I observed in all studied workers an anterior denticle on the ventral face of the petiole, contrary to Forel's statements.

The female caste has been described by Borgmeier (*op. cit.*) from a dealated queen, possibly collected with the syntype workers, and labelled as a "cotype". As Forel explicitly used only the worker and may have not even studied this particular female I added a label to the queen saying "não consta da descrição original, Brandão, 1985". All known queens of this species are dealated. Borgmeier's specimen has the largest ocelli in the series.

The medium seta of the clypeus may be wanting in some workers. Also the antennal sockets may be circled by a faint striation, which can reach the lateral portions of the clypeus.

At the Estação Biológica de Boracéia I collected, under a rotten log, a colony with 260 workers, immatures (only larvae) and a dealated queen. The colony occupied hollow spaces among crevices and the soil beneath. I was not able to observe any definite cameras nor entrances. Lüderwaldt (1926) described the nest of *M. iheringi* as: "found in the wild, among bromeliads and epiphytes, with approximately 200 workers".

Material examined: BRASIL: *São Paulo*: Alto da Serra 12 ♀ (MZ-types), 2 ♀ (MZ), 1 ♀ (MNRJ - type), 3 ♀ (MVG-types); Parque Cajuru (Paranapiacaba) 4 ♀ (MZ - types); Estação Biológica de Boracéia, município de Salesópolis, 10 ♀, 4 ♀ (MZ), 1 ♀, 2 ♀ (MCZ); Horto Florestal São Paulo, 2 ♀ (MZ); Meio da Serra (estrada velha São Paulo - Santos) 1 ♀, 2 ♀ (FML), 1 ♀, 5 ♀ (MZ), 3 ♀ (NMNH), 1 ♀, 8 ♀ (MCZ); São Paulo - Eng. Marsillac (KM 48) 9 ♀ (MZ); Eng. Marsillac 1 ♀ (MZ).

Megalomyrmex modestus

(Figs. 6, 13, 17, 19, 30)

Megalomyrmex modestus Emery, 1896: 94, ♀.

Type Loc.: Suerre (near Jimenez), Alajuela, Costa Rica (10° 13'N, 83° 43'W).

Lectotype designation

Lectotype and paralectotype at Museo Civico di Storia Naturale Giacomo Doria, Genova, Italia.

Worker

Mandibles striate; clypeus with anterior medium denticle; antennal club with 4 segments; frontal suture not impressed; occipital margin not raised; pronotum dorsal profile round; promesonotal suture not impressed dorsally, mesosternum and metasternum with sharp paired teeth; propodeum faces meeting in an obtuse angle in lateral view, sometimes forming a carina; declivity smooth; dorsal profile of petiole round in frontal view; ventral face of postpetiole without process.

Pilosity: small erect hairs (ca. .1mm) uniformly distributed on the whole body, but dorsal aspect of thorax, petiole and postpetiole, apex of nodes, and gaster, with long hairs (ca. .2mm).

Color: bright brownish-yellow.

Queen

Differing from workers in superficial sculptures covering most of head capsule; anterior ocellus similar in size to the posterior ones; pterothorax with areas of striation at margins of pronotum and mesonotum; paraptera with longitudinal rugosities on lateral areas; mesonotum with notaulus and parapsidal sutures; petiolar spiracles laterally produced; ventral face of petiole with a longitudinal translucent flange; ventral face of postpetiole with an acute tooth.

Male

Clypeus swollen and smooth; head capsule constricted at vertex; scape, pedicel, mandibles and legs paler than rest of body; mesonotum with parapsidal sutures, but no notaulus; epipetiolar carina not complete; declivity with concentric rugosities over the foramen; petiolar and postpetiolar nodes globoses; without ventral processes.

Comments

Contrary to Emery's description all workers studied have five teeth on the mandibles, not six. Forel (1899) stated that A. Alfaro collected the type workers from a rotten log.

Along with the specimen collected by Kugler at Finca Los Guadales there is a label saying: "large nest in rotten log, soil - rocks, under forest". Kugler (1978) figured some aspects of the venom apparatus of these specimens.

In spite of slight differences in measurements, all studied specimens agree in all characters with the type series.

Material examined: COLOMBIA: Depto *Choco*: Finca los Guadales, Rio Torito, 10 Km SW San José del Palmar, 1 ♀, 1 ♂, 6 ♀ (MCZ), 1 ♀, 1 ♂, 3 ♀ (MZ). COSTA RICA: *Alajuela*: Suerre, prox. Jimenez 2 ♀ (MGD- types); R. Toro Amarillo, ne. Guapiles, 3 ♀ (MCZ), 3 ♀ (MZ); R. Raventazon 1 ♀ (MZ). PANAMA: *Panamá*: Cerro Campana 1 ♀ (MCZ), 1 ♀ (MZ). VENEZUELA: *Bolivar*: Ayan Tepui, ca. Salto Angel, 1540m 5 ♀ (MZ), 12 ♀ (FAM n° 611).

Megalomyrmex wallacei

(Figs. 7, 14, 20, 25)

Megalomyrmex wallacei Mann, 1916: 445-446, pl 3, fig. 28, ♀, ♂. Type Loc.: Porto Velho, RO, Brasil (08° 46'S, 63° 55'W).

Lectotype designation

Lectotype (♀) Museum of Comparative Zoology, Harvard University (n° 9082); paralectotype (♀) National Museum of Natural History, Washington, DC, USA.

Worker

Mandibles striate; clypeal border not denticulate; frontal suture not impressed; occipital margin raised and visible (frontal view); compound eyes interrupting lateral margins of head capsule in frontal view; dorsal profile of pronotum round; promesonotal suture impressed dorsally; mesosternum and metasternum without ventral processes; propodeum declivity with rugosities, declivity and dorsal faces not separated by angles; petiole may have an anterior denticle at the ventral face; postpetiole without ventral tooth.

Pilosity: long hairs (more than .2mm) at thorax dorsum, apex of petiolar and postpetiolar nodes and gaster. Small suberect hairs (.10 - .15mm) uniformly distributed on head, legs and sides of thorax and peduncle.

Color: bright brownish-yellow.

Queen

Ocelli equally developed; mesonotum with no notaulus nor parapsidal sutures; ventral process of postpetiole point-shaped. Body totally covered by rough punctures, except legs and distal portion of clypeus.

Comments

In the original description Mann said that all types came from Porto Velho. I found, however, at the National Museum of Natural History and Museum of Comparative Zoology respectively 3 and 2 workers from Abunã, Mt (sic) labelled as "cotypes, W.M. collection n° 1954". To these individuals I added a label saying "not in the original description, Brandão, 1986". In the descriptions of other species, as well as in the locality

citations, Mann considered Abunã a distinct locality from Porto Velho.

I designated a queen as the lectotype because I did not take measurements from the syntype worker of the National Museum of Natural History. Nevertheless I have no doubt that this worker belongs to *M. wallacei*.

Mann's original description includes some generic characters and some mistakes. The marginal blade of the mandibles contains always 5 teeth, instead of 4 as stated. Also the pointed "feeble" depression at the mesonotum could not be observed in all series and should not be considered as a species character.

There are no informations on the biology of this rather common ant. Two worker specimens in the National Museum of Natural History, Washington, bear a label from the New York Quarantine Authority stating that they were collected from Brazilian orchids of unknown origin.

M. wallacei differs from all other *Megalomyrmex* species in the superficial sculpture of the body, that can cover the entire head capsule or, at least, the front part of it, excluding, in general, the clypeus and frontal area. Also the dorsal face of propodeum, part of the declivity and posterior slopes of petiolar and postpetiolar nodes are covered by irregular punctations or transversed oriented reticulations. The pronotum and mesonotum of some samples from Manaus and Benjamin Constant may have superficial sculptures over its shining integument. In the Abunã specimens the thorax bears punctations similar to those observed on the vertex, making the specimens look opaque.

The type specimens, from the southernmost portion of the known distribution, show the smallest measurements.

Material examined: BRASIL: Amazonas: Benjamin Constant 1 ♀, 5 ♀ (MCZ), 1 ♀, 3 ♀ (MZ); Manaus 6 ♀, 22 ♀ (MZ), 2 ♀, 7 ♀ (MCZ), 2 ♀, 4 ♀ (CAMP), 1 ♀, 7 ♀ (INPA), 1 ♀, 5 ♀ (NMNH), 4 ♀ (BM); Rio Tutotabi 1 ♀ (MZ). Rondônia: Abunã 3 ♀ (NMNH), 2 ♀ (MCZ); Porto Velho 1 ♀ (MCZ-lectotype), 1 ♀ (NMNH-paralectotype).

Megalomyrmex weyrauchi

(Figs. 8, 16)

Megalomyrmex weyrauchi Kempf, 1970: 357-359, figs. 3-4 ♀. Type Loc.: Llama, northern Peru, 2350m, possibly Llama, Cajamarca, Peru (06° 31'S, 79° 08'W).

Types

Holotype and 27 paratypes Museu de Zoologia da USP; 5 paratypes Museum of Comparative Zoology, Harvard University.

Worker

Mandibles smooth with 5-6 teeth; anterior border of clypeus with a median denticle; frontal suture impressed; 3-segmented club; pronotum not tuberculate; promesonotal suture not impressed on thorax dorsum; mesosternum and metasternum without ventral teeth; declivity smooth; anterior slope of petiole straight; ventral face of petiole with anterior denticle; postpetiole without ventral process.

Pilosity: hairs (ca. .1mm) uniformly distributed over the entire body surface, more profuse on the mandibles, head vertex, escape, petiole dorsum, postpetiole, legs and gaster apex.

Color: brown, almost black, opaque.

Comments

M. weyrauchi is known only from the type series. In the original description Kempf noted the variation in the number of mandibles teeth, and unusual character in *Megalomyrmex*. Kempf compared his species with *M. iheringi*. However the character he used to differentiate between them could not be validated. He affirms that in *M. iheringi* the epipetiolar carina is not complete over the foramen, while in *M. weyrauchi* it always is. My observations on *M. iheringi* did not confirm this statement.

The petiolar shape of *M. weyrauchi*, in side or front views, clearly separate this species from all other known *Megalomyrmex* of this group.

Kempf cites 29 types (holotype and paratypes) all deposited in the Museu de Zoologia. I found only 27 paratypes. From the Fundación Miguel Lillo I received, as a loan, 5 specimens of *M. weyrauchi* with a typewritten label saying: "*Megalomyrmex* sp. n. Kempf det." At the MCZ

collection I found 5 more specimens, clearly labelled as paratypes by Kempf himself. To the Tucuman specimens I added a label saying "not in the original description, Brandão, 1985".

There are no informations on the biology of this species.

Leoninus group

Megalomyrmex acauna, sp.n.

Megalomyrmex balzani

Megalomyrmex cyendyra, sp.n.

Megalomyrmex emeryi

Megalomyrmex foreli

Megalomyrmex glaesarius

Megalomyrmex latreillei

Megalomyrmex leoninus

Megalomyrmex pacova, sp.n.

Megalomyrmex staudingeri

Megalomyrmex timbira, sp.n.

Members of the Leoninus group can be characterized as follows: relatively large monomorphic workers (WL between 2.13 and 3.7 mm) with triangular mandibles, dental formula always 1 + 4; palpal formula 4:3; clypeus always smooth; 3 - to 5 - segmented antennal club (more often 3-), the segments larger but not much than the ordinary ones; first funicular segment never twice as long as the second; compound eyes with 15-25 ocular facets at largest diameter; frontal suture generally impressed; pronotum may have lateral swellings; promesonotal suture distinctly impressed dorsally in all species, but in *M. cyendyra*, sp.n., anepisternum and katepisternum never divided by sutures; dorsal faces of propodeum meeting either in an obtuse angle or in lateral tubercles; epipetiolear carina in general complete over the foramen; postpetiolear spiracles never laterally produced; gennal plate round to acuminate.

Workers of this group never present rugosities on the body surface, except for concentric rugosities on the foramen. The pilosity pattern is also constant, with erect hairs (.2 - .3mm) on the clypeus, pronotal disc, dorsum of propodeum, apex of petiolear and postpetiolear nodes and gaster. The rest of the body surface may have small suberect hairs (smaller than .15 mm) specially on the scapes, head dorsum, lateral portions of thorax and

legs. Funiculus always with appressed pubescence.

The Leoninus group corresponds roughly to *Megalomyrmex s.s.* (see discussion on pag. 418). It includes the largest workers in the genus, comparable in size only to those of a few other myrmicine genera, thus justifying the name chosen by Forel.

The group comprises free-living species that may tend membracid nymphs, and inhabit preformed cavities among or under stones and rotten logs, with no indications of definite architecture.

Workers forage individually, not showing any kind of recruitment of nestmates, even when faced with large food items pinned on the ground. From the few notes on museum catalogs and labels it can be said that they forage on the ground but visit bushes no higher than 1m. I found in the stomacal contents of the arboreal lizard *Plica umbra* L. from Sto. Antonio do Içá, AM, Brasil a worn mandible of a *Megalomyrmex* from this group (either *M. balzani* or *M. staudingeri*).

There are no true queens in the Leoninus group. I found, however, in most species, gamergates taking over the reproductive function. A similar situation was described by Ward (1984) for the New Caledonia fauna of *Rhytidoponera*, with 19 related queenless species in the *impressa* group.

The sole participation of gamergates in reproduction affects speciation, dispersion rates and intraspecific variation. Ward (1983) found out that the correlation among workers from species with gamergate is significantly smaller ($r = .3$) than among workers from colonies with true queens. ($r = .75$).

The Leoninus group has a pan-Amazonian distribution, specially on the west, reaching the eastern Andean slopes. In Colombia and Venezuela they show an Andean distribution. In Ecuador and Central America they are Transandean (Nieves, Ecuador). There is only one species in the Brazilian cerrado (*M. acauna*, sp.n.).

Workers of the Leoninus group share with species of the Modestus group some characters I consider as generalized: mandibular dental formula, palpal formula and a slender dorsal arm on the venom apparatus. In relation to the Modestus group, the Leoninus group is derived as to the loss of true queens and to the tendency toward a

progressive modification of the genual plate, from a round plate to a long and sharp spine.

Key to species (workers) in the *Leoninus* group

- 1) A. Dorsal faces of mandibles striate 2
B. Dorsal faces of mandibles smooth 3
- 2) A. 4-5- segmented antennal club; frontal suture impressed; promesonotal suture not impressed dorsally; dorsum of propodeum not depressed; anterior face of petiole in side view straight; border of petiolar node in frontal view round
..... *M. cyendyra*, sp.n.
B. 3-segmented antennal club; frontal suture not impressed; promesonotal suture impressed dorsally; dorsum of propodeum impressed transversally in profile; anterior border of petiole concave; border of petiolar node in frontal view subquadrate *M. glaesarius*
- 3) A. Ventral face of postpetiole with and acute tooth (Figs 43 and 47) 4
B. Ventral face of postpetiole without an acute tooth (*M. pacova*, sp.n. may have a small pointed process - Fig. 46) 5
- 4) A. Anterior border of clypeus round, without median denticle; epipetiolar carina not complete dorsally; dorsal border of petiolar node round in frontal view
..... *M. foreli*
B. Anterior border of clypeus straight with a median denticle; epipetiolar carina complete; dorsal border of petiolar node subquadrate in frontal view without a definite apex *M. latreillei*
- 5) A. Mesosternum and metasternum acrotergites shaped as sharpened paired teeth 6
B. Mesosternum and metasternum without paired acrotergites 7
- 6) A. Anterior border of clypeus round; dorsum of propodeum at most with a feeble longitudinal depression; dorsal face and declivity meeting in a gentle angle (in side view), not forming tubercles nor carinae; epipetiolar carina complete dorsally; petiole with an anteroventral tooth originating a longitudinal translucent flange
..... *M. balzani*
B. Anterior border of clypeus straight; dorsum of propodeum distinctly depressed longitudinally; dorsal and slope faces of propodeum meeting in square angle (in side view), forming two lateral flattened tubercles; epipetiolar carina not complete dorsally; anteroventral tooth of petiole not originating a flange *M. emeryi*
- 7) A. Dorsal border of petiole (in side view) forming a continuous curve from the foramen to the node apex 8
B. Dorsal border of petiole in side view straight, at least at node anterior slope ...
..... 10
- 8) A. Anterior border of clypeus with median denticle; dorsum of propodeum not depressed longitudinally *M. leoninus*
B. Anterior border of clypeus without a median denticle; dorsum of propodeum longitudinally depressed 9
- 9) A. Occipital margin visible in head frontal view; dorsal profile of propodeum faintly impressed medially; declivity with rugosities over the foramen; small pointed process under the postpetiole always present *M. pacova*, sp.n.
B. Occipital margin not visible in head frontal view; propodeum faces meeting in a square angle, without median depression; declivity smooth; ventral face of postpetiole without process *M. timbira*, sp.n.
- 10) A. Occipital margin visible in head frontal view; head largest diameter at vertex; non-pedunculate petiole with a round posterior face; anterior slope of postpetiole round *M. acauna*, sp. n.
B. Occipital margin not visible in head frontal view; largest diameter of head at cheeks; pedunculate petiole with straight posterior face; anterior slope of postpetiole straight *M. staudingeri*

***Megalomyrmex acauna*, sp. n.**

(Figs. 39, 56)

Megalomyrmex acauna, sp. n., ♀. Type Loc.: Gustavo Dutra, MT, Brasil (14° 43'S, 55° 39'W); Chapada, MT, Brasil, (15° 26'S, 55° 45'W).

Table 3. Measurements of *Megalomyrmex* of the Leoninus group (in mm) - Types

♀ holotype or lectotype	HW	HL	ML	SL	WL	PL	PW	pPL	pPW	HFL	GL	TL
<i>M. acauna</i> , sp. n. holotype	1.48	1.68	.88	2.13	2.35	.93	.50	.48	.58	2.55	2.53	8.85
<i>M. balzani</i> lectotype	1.87	1.92	1.30	2.45	2.95	.98	.48	.50	.54	2.30	3.15	10.80
<i>M. cyendyra</i> , sp. n. holotype	1.27	1.43	.78	1.83	2.15	.60	.35	.43	.45	2.25	1.80	7.19
<i>M. emeryi</i> holotype	1.73	2.05	1.08	2.88	2.90	1.13	.80	.75	.68	3.58	3.18	11.09
<i>M. foreli</i> lectotype	1.73	1.97	1.06	2.42	2.85	1.12	.36	.82	.64	2.82	2.58	10.40
<i>M. glaesarius</i> holotype	1.45	1.50	.68	1.75	2.20	.63	.43	.43	.50	2.05	1.96	7.40
<i>M. latreillei</i> holotype	1.50	1.80	.90	1.98	2.28	.80	.48	.48	.48	1.95	2.55	8.81
<i>M. leoninus</i> lectotype	1.93	2.25	1.20	-	3.23	1.30	.63	.68	.63	3.85	3.25	11.91
<i>M. pacova</i> , sp. n. holotype	1.35	1.55	.80	2.15	2.43	.85	.45	.50	.48	2.65	2.35	8.48
<i>M. staudingeri</i> holotype	2.03	2.42	1.39	3.61	3.58	1.33	.64	.78	.61	3.09	3.21	12.71
<i>M. timbira</i> , sp. n. holotype	1.65	1.78	1.01	2.13	2.53	.95	.60	.48	.60	2.48	2.43	9.18

Table 4. Measurements of *Megalomyrmex* of the Leoninus group (in mm).

♀	N	HW	HL	SL	WL
<i>M. acauna</i> , sp. n. paratypes	18	1.45-1.63	1.68-1.75	2.13-2.28	2.35-2.50
<i>M. balzani</i> several localities	50	1.66-2.10	1.78-2.40	2.30-3.00	2.50-3.33
<i>M. cyendyra</i> , sp. n. paratypes	12	1.15-1.25	1.38-1.48	1.75-1.85	2.03-2.10
<i>M. foreli</i> several localities	30	1.83-1.86	1.85-2.08	2.50-2.58	2.30-3.09
<i>M. glaesarius</i> paratypes	34	1.38-1.45	1.48-1.61	1.70-1.77	2.13-2.25
<i>M. latreillei</i> several localities	13	1.50-1.80	1.80-2.13	1.98-2.38	2.28-2.73
<i>M. leoninus</i> several localities	40	1.37-2.00	1.68-2.34	2.18-2.97	2.37-3.28
<i>M. pacova</i> , sp. n. paratypes	7	1.35-1.45	1.55-1.68	2.15-2.25	2.43-2.55
<i>M. staudingeri</i> all workers examined	8	1.97-2.28	2.40-2.81	3.60-3.75	3.52-3.70
<i>M. timbira</i> , sp. n. paratypes	2	1.63-1.65	1.78-1.83	2.13-2.20	2.48-2.53

Types

Holotype (G. Dutra) and 10 paratypes (1 from Chapada, 9 from G. Dutra) at Museu de Zoologia da USP; 2 (G. Dutra) paratypes at Museum of Comparative Zoology, Harvard; 6 paratypes (G. Dutra) at Museu Nacional do Rio de Janeiro.

Worker

Mandibles smooth; anterior clypeal border straight with median denticle; 3-segmented antennal club; frontal suture impressed; 18 ocular facets at compound eye largest diameter; promesonotal suture impressed dorsally; mesosternum and metasternum without acrotergites; propodeum dorsum not depressed; declivity smooth; epipetiolar carina complete; non-pedunculate petiole with anteroventral denticle; dorsal margin of petiole in side view straight; ventral face of postpetiole without process; genual plate acuminate.

Comments

The specimen choosed as holotype bears a labels saying "*Megalomyrmex nigricornis*, sp. n., Borgmeier det. ". Accordingly I select the name *acauna*, meaning black horns in the Tupi language, due to the black scapes of the antennae, that differentiate this species from all others in the group.

The types from Gustavo Dutra have been collected by the late Dr. Cincinnato R. Gonçalves in October, 25, 1953. The paratype from Chapada has been collected by C. Aman in July, 1960.

M. acauana, sp. n., is close to *M. balzani*, from which can be separated by the characters listed in the diagnosis.

Megalomyrmex balzani

(Figs. 40, 58, 63, 66, 72, 74 - 76, 83 - 85)

Megalomyrmex balzani Emery, 1894: 153, ♀.

Type Loc.: Cantoni di Coroico, Chulumani - Yungas, Bolivia (16° 10'S, 67° 44'W). Viehmeyer, 1922: 209-211, ♂. Wheeler, 1925a: 29, ♂.

Megalomyrmex duckei Forel, 1912: 13-14, ♀.

Type Loc.: Santo Antonio do Içá, AM, Brasil

(03° 05'S, 68° 00'W). *Syn. n.* (types examined - 2 ♀ at Muséum de la Ville de Genève).

Lectotype designation

Lectotype and 3 paralectotypes at Museo Civico di Storia Naturale Giacomo Doria, Genova.

Worker

Mandibles smooth; anterior clypeal border round with median denticle; 3-segmented antennal club; frontal suture impressed; 18-20 ocular facets at compound eye largest diameter; occipital margin raised, visible only in head lateral view; pronotum dorsum with low lateral elevations; promesonotal suture impressed dorsally; mesosternum and metasternum with sharpened paired acrotergites; propodeum dorsum not impressed; declivity smooth; epipetiolar carina complete; non-pedunculate petiole with anteroventral denticle originating a longitudinal translucent flange; dorsal margin of petiolar node, in frontal view, generally notched at apex; ventral face of postpetiole without process; apex of femura sharpened.

Color: shiny orange-brown to deep brown. The specimens from Humaitá, AM and Pto. Maldonado, Peru are distinctly darker than any others series. In general gasters are darker than the rest of body.

Comments

At the original description of *M. balzani* Emery cited Chilumani (sic) as type locality. I received 5 "syntypus" from Genova, including a male, not mentioned in the description. This specimen received a label saying: "not in the original description, Brandão, 1984".

Forel (1912) described *M. duckei* upon workers collected by A. Ducke at an unknown date. All characters Forel used to differentiate *M. duckei* from *M. balzani* are highly inconstant, even in specimens from the same nest. The measurements also indicate that all characters obtained from *M. duckei* types are within the variation range of *M. balzani* workers. I therefore consider *M. duckei* identical to *M. balzani*.

The specimens cited by Wheeler (1923) from Manaus and Mann (1916) from Manaus, Porto Velho and Madeira-Mamoré (camp 39) as *M. bituberculatus* belong to *M. balzani*.

M. balzani and *M. leoninus* occur sympatrically at São Gabriel da Cachoeira, AM, Brasil. Borgmeier (1930), studied samples deposited at the MZUSP from this locality collected by Zikan and Deisenhofer. Zikan material, however, belongs to two different species. Samples numbered 4074 are *M. balzani* while samples n° 4351 belong to *M. leoninus*.

M. balzani workers can be easily separated from those of *M. leoninus* by the presence of paired sharpened acrotergites at the mesosternum and metasternum of *M. balzani*.

Some workers from Cavinás, Beni, Bolivia as well as individuals from some other localities, have an anterior ocellus and the gaster swollen. The Cavinás specimens also have a modification at the venom apparatus depicted at Fig. 75. These workers are probably gamergates.

Both description of *M. balzani* males are rather complete and thus I am not presenting a formal description of males, only figures of head and genitalia (Figs. 63, 66).

Mann (1916), described the nest of this species (misidentified by him as *M. bituberculatus*) as subterranean with entrances, in general, at tree bases. Locality labels from workers collected near Rio Tambopata, Peru by C. Kugler indicate "nests in very rotten stump and soil beneath". According Mann these ants are rather slow and may tend membracid nymphs. I found at the Museu de Zoologia workers from Manaus associated with nymphs of *Aconophora* sp (Membracidae). Dr. W. Benson (personal communication) observed workers of *M. balzani* tending nymphs and adults of *Tragopa* sp (Membracidae) kept in silk-spinned "nests" over small branches no higher than 1m.

Oliveira (1982) observed that workers of *M. balzani* are the model for the yellow form of the mimetic spider *Myrmecium bifasciatum* (Clubionidae). He found the ants in small groupstending membracids in bushes also no higher than 1 m.

M. balzani is the better represented species in museum collections, due to Mann collections at Mulford Biological Expedition from 1921 to 1922, Rio Beni, Bolivia. Part of the scientific results from this expedition can be found in Snyder (1926), including a map with all visited localities. A romantic account of the same trip has been written by Mac Creagh (1961).

All samples from Humaitá and Porto Velho as well as part of the Tumupasa series have the dorsal margin of the petiole, in frontal view, rounded and not notched. These species also present the declivity with lower and profuse pilosity. From Tumupasa I studied 70 workers. Both forms were never found pinned together, suggesting they came from different nests. As all cited characters also variates within other nests series I believe they represent intraspecific variation.

Males from Rurrenabaque, Beni, Bolivia do not have notaulus at the mesonotum, but can not be distinguished from other males in any other characters.

Material examined: BOLIVIA: Beni: Cavinás 3 ♀ (NMNH); 3 ♀ (MZ); Rio Colorado 1 ♀ (MZ); Covendo 3 ♀ (NMNH), 2 ♀ (MZ), 2 ♀ (MCZ); Huachi 22 ♀ (NMNH), 9 ♀, 1 ♂ (MZ), 3 ♀ (MCZ); Rio Ivon 1 ♀ (NMNH); Ixiamas 7 ♀ (NMNH), 5 ♀ (MZ), 3 ♀ (MCZ); Mapiri 3 ♀ (MGD), 1 ♂ (MZ); Rurrenabaque 14 ♀, 1 ♂ (NMNH), 6 ♀, 1 ♂ (MZ), 3 ♀ (MCZ); San Fermin 1 ♀ (MZ), 1 ♀ (MCZ); Santa Helena 1 ♀ (MZ); Songo 2 ♀ (MZ); Tumupasa 43 ♀ (NMNH), 1 ♂, 15 ♀ (MZ), 6 ♀ (MCZ), 1 ♀ (BM), 1 ♀ (NMB). Yungas: Cantoni di Coroico 4 ♀, 1 ♂ (types-MGD); Coroico 1 ♀ (MZ). BRASIL: Acre: Vila Taumaturgo 1 ♀ (MZ). Amazonas: Benjamin Constant 1 ♂ (MZ), 1 ♀ (MCZ); Humaitá 6 ♀ (MZ), 2 ♀ (MCZ); Manaus 36 ♀, 1 ♂ (MZ), 12 ♀ (MNRJ), 12 ♀ (CAMP), 1 ♀ (MNH), 3 ♀ (RM), 12 ♀ (INPA), 18 ♀ (NMNH), 18 ♀ (MCZ); São Gabriel 10 ♀ (MZ), 3 ♀ (MCZ), 15 ♀ (MNRJ); Santo Antonio do Içá 2 ♀ (types of *M. duckei*, MVG); Tabatinga 14 ♀ (MZ), 14 ♀ (MNRJ), 2 ♀ (BM), 2 ♀ (MCZ), 2 ♀ (NMB), 2 ♀ (MGD); Rio Tarumã (High Falls) 2 ♀ (MCZ), 2 ♀ (MZ); Rio Trocary 2 ♀ (MZ). Rondônia: Madeira-Mamoré, camp 39, 4 ♀ (MCZ), 3 ♀ (MZ); Porto Velho 3 ♀ (MCZ), 6 ♀ (MZ), 12 ♀ (NMNH); Ji-Paraná 1 ♂ (INPA), 1 ♂ (MZ). COLOMBIA: Amazonas: 50 km aval de la Chorrera (Plateaux de Grés) 6 ♀ (MNH), 3 ♀ (MZ). Witoto Jitomagaro 1 ♀ (MZ). PERU: Cuzco: Quincemil 1 ♂ (MZ). Pto. Maldonado: 5 km SE rio Tambopata, Finca Medina 9 ♀ (MZ), 4 ♀ (MCZ)

Material examined from not specified localities:

Bolivia 1 ♀ (BM n^o 94.233); Bolivia 1 ♀ (NMNH collection. T. Pergande); Bolivia, Chaco 1 ♀ (MGD); 3 ♀ (RM, col. N. Homgren, Wheeler det. *M. balzani*); Bolivia. 1 ♀ (MNHN - coll. E. Andre).

***Megalomyrmex cyendyra*, sp. n.**

(Figs. 44, 54)

Megalomyrmex cyendyra, sp. n. ♀. Type Loc.: Rio San Juan del Digua, ca. Queremal, 1300m, Valle del Cauca, Colombia (03° 31'N, 76° 43'W) holotype and 5 paratypes); Farallones de Cali Park, El Topazio, ca. Pance, 1550m, Valle del Cauca, Colombia (03° 20'N, 76° 43'W) (4 paratypes); Pance, munic. Cali, Valle del Cauca, Colombia, 1700m (same coordinates of El Topazio).

Types

Holotype and 2 paratypes from Queremal, 2 paratypes from Pance at Museum of Comparative Zoology, Harvard; 3 paratypes from Queremal, 2 from Pance and 2 from El Topazio at Museu de Zoologia da USP; 2 paratypes from El Topazio at Facultad de Agronomia de Maracay, Venezuela.

Worker

Mandibles faintly striate; anterior clypeal border straight without denticle; frontal suture impressed; 21 ocular facets at compound eye largest diameter: (4-5) segmented antennal club; occipital margin not raised; promesonotal suture impressed only laterally. promesonotal profile continuous; mesosternum and metasternum without acrotergites; dorsal face of propodeum indistinct from declivity; declivity striate; epipetiolar carina complete; non-pedunculate petiole with dorsal margin straight in side view; dorsal margin of petiolar node round in frontal view; petiolar spiracles laterally produced; ventral face of petiole without denticles, but with a longitudinal non-translucid flange that attains the spiracles region; ventral process of postpetiole globose; apex of postpetiole acuminate; gennal plates round.

Comments

The samples from Pance and Queremal have been collected respectively by W.L. Brown Jr. & Chaplin in June, 16, 1971 ("mountain rain forest") and W.L. Brown Jr. in July, 28, 1973 ("mountain forest"). The types from El Topazio have been collected by J. Lattke (accession number 2150) at December, 31, 1981. The Maracay collection houses 21 more workers of this series.

The composed name cy-endyra means mother-sister in Tupi language, regarding the gamergate found with the Queremal sample.

Megalomyrmex cyendyra, sp. n., shares with *M. glaesarius* the striate mandibles, but can be distinguished from this species and all other *Megalomyrmex* by the 4-segmented antennal club and from members of this group by the continuous dorsal profile of the promesonotum.

Megalomyrmex emeryi

(Fig. 38, 50, 64, 65, 67, 70, 79, 82)

Megalomyrmex emeryi Forel, 1904a: 174-175.

♀. Type Loc.: Suriname.

Type

Holotype at Institute Royal des Sciences Naturelles de Belgique, Bruxelles (coll. Ballion, ex coll. Puls).

Worker

Mandibles smooth, anterior clypeal border straight without denticle; frontal suture impressed; 3-segmented antennal club; 21 ocular facets at compound eye largest diameter; occipital margin raised, visible at head frontal view; lateral portions of pronotal disc distinctly swollen, separated by a sagittal depression; promesonotal suture impressed dorsally; mesosternum and metasternum with developed acrotergites paired teeth; dorsal face of propodeum, in side view, depressed transversally; dorsal face and declivity of propodeum meeting laterally in conical tubercles divergent and round at apex; propodeum dorsum deeply impressed longitudinally; declivity smooth; epipetiolar carina incomplete; non-pedunculate petiole with anteroventral denticle; dorsal margin of petiolar node, in side view, straight; squamiform petiole with sharp

dorsal margin. notched at the center (Fig. 79): postpetiole without ventral processes and longitudinally depressed node; gential plates acuminate.

Male

Clypeus smooth without anterior denticle; cephalic integument smooth next to the compound eyes; 3 first funicular segments larger than scape; mesonotum with parapsidal suture impressed, but no notaulus; epipetiole carina incomplete; dorsal face of propodeum smooth; petiolar spiracles laterally produced; petiolar node globose; postpetiolar node conical and ventral process spatulate advancing beneath the first gastric segment; Rs divided in Rs_1 and Rs_2 , Rs_2 not equally developed on right and left wings.

Comments

The holotype is the only known worker of *M. emeryi*. Dr. W. L. Brown Jr. kindly remount the specimen after treatment with Barber fluid.

It was not possible to ascertain the type locality.

M. emeryi exhibits various characters representing extremes within the variation range of the genus, suggesting a high degree of derivation. For instance, the node shape, pronotal lateral swellings and the degree of the longitudinal depression on propodeum dorsum. The extreme development of the gential plates in a spine-like projection (fig. 82) called my attention. At the largest portion of the plate there is a white rounded spot, which may correspond to a gland, but confirmation would require alive specimens.

A *Megalomyrmex* male of the Leoninus group collected at Alicoto-Oyapock, Guiana, at light-tramp, by the Guiane Mission (Balachowsky-Grunner) between October-November, 1969, also exhibits some "exaggerated" characters.

I associated it at least provisionally with *M. emeryi* (Figs. 64, 65, 67, 70).

Material examined: SURINAME: 1 ♀ (holotype/IRB). GUIANE: Alicoto, Rio Oyapock 1 ♂ (MZ).

Megalomyrmex foreli

(Figs. 43, 49, 60, 68, 80)

Megalomyrmex foreli Emery, 1890: 46-47, pl. 5, fig. 3, ♀. Type Loc.: Jimenez, Alajuela,

Costa Rica (10° 13' N, 83° 43' W). Forel, 1899: 57-58, ♂.

Lectotype designation

Lectotype and 2 paralectotypes at Museo Civico di Storia Naturale "Gustavo Doria", Genova; 1 paralectotype at National Museum of Natural History, Washington; 1 paralectotype at British Museum; 3 paralectotypes at Muséum National d'Histoire Naturelle, Paris and 2 paralectotypes at Museu de Zoologia da USP.

Worker

Mandibles smooth; anterior clypeal border round, without denticle; frontal suture not impressed; 3-segmented antennal club; 18-20 ocular facets at compound eye largest diameter; occipital margin not raised; promesonotal suture impressed dorsally; well developed paired acrotergites at mesosternum and metasternum; dorsal face and declivity of propodeum meeting in a square angle, in side view; declivity smooth but deeply excavated, forming two lateral low tubercles; epipetiole carina not complete; non-pedunculate petiole with anteroventral denticle leading to a longitudinal translucent flange; dorsal margin of petiolar node, in side view, concave; postpetiole with sharp ventral tooth; apex of femura round (Fig. 80).

Color: in general head, thorax and legs shiny orange with deep-brown gaster.

Male

Clypeus with anteromedian denticle, without carinae; 1 or 2 concentric striations around compound eyes; 2nd and 4th funicular segments larger than other segments; declivity smooth; epipetiole carina not complete; mesosternum with a ventral tooth; postpetiole without ventral process and twice as large as the petiole, broadened attached to the first gastric segment.

Comments

Some characters listed in the worker diagnosis have been neglected in Emery's original description, as mandibles, clypeus, promesonotal suture, mesosternum and metasternum and apex of femura.

The paralectotype of National Museum of Natural History collection has the ventral tooth

of the postpetiole eroded, but its scar can be observed at 40 magnifications.

Forel (1899) described the male upon the only known specimen from Volcan de Chiriqui, Panama. He labelled the specimen as "type du mâle". I add a label saying: "not in original description, Brandão, 1986".

The specimens collected at Rio Negro, Bogota, Colombia bear a label informing: "Cacao - associated with membracids *Horiola picta* (Coquebert)". The samples from Valdivia, Colombia also came from "arboles de cacao".

Kugler (1979) observed in collection specimens a large solidified drop held by the spatulate lancets of the venom apparatus. He suggested that the substance lasted because of its viscosity, as is the case in *Monomorium* and *Crematogaster*.

Type specimens have the epipetiolar carina not complete dorsally. In contrary specimens from the southernmost distribution of *M. foreli* at Colombia have this carina complete.

I observed intraspecific variation in pilosity, lower and denser in Rio Negro, Colombia and color pattern; the gaster may have the same color as the rest of the body at Rio Toro Amarillo, Costa Rica.

Material examined: COSTA RICA: Colombiana Farm, prov. Santa Clara. 1 ♀ (NMNH), 1 ♀ (MZ); Jimenez (types) 3 ♀ (MGD), 1 ♀ (NMNH), 1 ♀ (BM), 3 ♀ (MNHN), 2 ♀ (MZ); Rio Toro Amarillo 4 ♀ (MZ), 6 ♀ (MCZ); San Carlos 3 ♀ (MGD); Volcan de Chiriqui 1 ♀, 1 ♂ (MZ), 2 ♀ (BM). COLOMBIA: *Antioquia*: Valdivia 1 ♀ (NMNH), 3 ♀ (MZ). *Bogota*: Rio Negro 2 ♀ (NMNH), 1 ♀ (MZ). *Providencia*: Quebrada La Tirana 2 ♀ (MCZ), 2 ♀ (MZ).

Megalomyrmex glaesarius

(Figs. 48, 52, 69, 71)

Megalomyrmex glaesarius Kempf, 1970: 355-356, figs. 1 - 2, ♀. Type Loc.: Llama, Cajamarca, Peru (06° 31'S, 79° 08'W).

Types

Holotype and 35 paratypes at Museu de Zoologia da USP.

Worker

Mandibles striate: anterior clypeal border straight, without median denticle; frontal suture not impressed; 3-segmented antennal club; 15 ocular facets at compound eye largest diameter: occipital margin not raised; promesonotal suture impressed dorsally; mesosternum and metasternum without acrotergites; dorsal face of propodeum impressed transversally: declivity with 1 striation concentric to the foramen; epipetiolar carina complete; non-pedunculate petiole with anterior margin of node, in side view, concave and anteroventral denticle; dorsal margin of petiole node, in frontal view, subquadrate; postpetiole ventral face smooth with a round anterior process; apex of femura round.

Color: bright reddish-brown with deep brown gaster.

Comments

The types specimens bear a label of Weyrauch collection with the accession number 1069. I received 8 more non-type workers deposited at Fundación Miguel Lillo from the same series collection date, not cited at Kempf's original description, June, 10, 1956. At the Museum of Comparative Zoology I found another 6 workers of the same series labelled as paratypes. To the latter specimens I added a label, saying: "not in the original description, Brandão, 1984". In the MCZ collection I also found 19 workers of *M. glaesarius* collected by L. Peña at Ecuador, representing the second record for the species.

Three males from Lago Agrio, collected at Malaise trap, have the same color pattern as *M. glaesarius* workers. Nevertheless I refrain from identifying them as this species because the known workers came from arid localities above 2000m and the males came from forested areas no higher than 300m.

Material examined: ECUADOR: *Napo*: Nieves, 94 Km SW Cuenca, 10 ♀ (MCZ), 9 ♀ (MZ). PERU: *Cajamarca*: La Llama 36 ♀ (MZ - types), 6 ♀ (MCZ), 8 ♀ (FML).

Megalomyrmex latreillei

(Figs. 47, 53, 78)

Megalomyrmex latreillei Emery, 1890: 47, pl. 5, Fig. 4. ♀. Type Loc.: Cumbase (sic), probably

San Antonio de Cumbasa, San Martin, Peru (06° 21'S, 76° 19'W).

Type

Holotype at Museo Civico di Storia Naturale "Giacomo Doria", Genova.

Worker

Mandibles smooth; anterior clypeal border straight and denticulate; frontal suture impressed; 3-segmented antennal club; 24-25 ocular facets at compound eye largest diameter; occipital margin not raised; promesontal suture impressed; mesosternum and metasternum with sharpened paired acrotergites; dorsal face and declivity of propodeum meeting in square angle in lateral view; declivity smooth; epipetiolar carina complete; non-pedunculate petiole with anteroventral denticle originating a longitudinal translucent flange; petiolar spiracles laterally produced; dorsal margin of petiolar node, in side view, concave; petiolar node with dorsal margin, in frontal view, subquadrate; ventral face of postpetiole with a sharp tooth; apex of femura acuminate:

Color: in general antennae, head, trunk, pedicel and legs bright reddish-brown, gaster dark-brown.

Male

Clypeus with anterior median denticle without carina. Head capsule, smooth, except for the striations around compound eyes; scape funiculus and head with the same color; funicular segments not thickened; mesonotum with parapsidal sutures but no notaulus; mesosternum with ventral tooth; propodeum smooth with epipetiolar carina complete; petiolar and postpetiolar nodes globoses; ventral faces of petiole and postpetiole without ventral processes.

Comments

M. latreillei has been described in the key for the identification of *Megalomyrmex* workers prepared by Emery (1890).

The characters that separate this species from all other of this group are: tuberculate propodeum and the acute tooth under the postpetiole.

From the associated labels it was possible to learn that this species nests at "base of rotten stump, wood" and also inhabits cocoa trees.

The male I am associating with *M. latreillei* has been collected by Langley & Cohen at 18 Km NW from Lago Agrio, Ecuador at black light trap.

The worker holotype has the smallest values for all measurements taken. Also the petiolar spiracles are more distinctly laterally produced.

The propodeum shape varies among the available samples, but it is always tuberculate. I also noted intraspecific variation in relation to color pattern. The samples from Ecuador are paler than any other, while the specimens from Dureno and Puerto Misahualli do not have the gaster so dark.

Material examined: BRASIL: *Acre*: Cruzeiro do Sul 2 ♀ (MZ), 1 ♀ (BM). COLOMBIA: *Meta*: Caño El Buque, S Villavicencio, 9 ♀ (MCZ), 9 ♀ (MZ); Rio Guatiquia ("R. Guetiguia" at label) 2 ♀ (NMNH), 2 ♀ (MZ); Villavicencio 1 ♀ (NMNH), 2 ♀ (MZ). *Putumayo*: Villa Amazonia, "near" Mocoa, 1 ♀ (MZ); Villa Garzon 2 ♀ (BM), 1 ♀ (MZ); Rio Caque, La Carlia, 2 ♀ (BM), 2 ♀ (MZ). ECUADOR: *Napo*: Dureno 1 ♀ (MZ); Lago Agrio 1 ♂ (MZ); Puerto Misahualli 2 ♀ (MZ), 1 ♀ (GJU). PERU: *San Martin*: San Antonio de Cumbasa (holotype - MGD).

Megalomyrmex leoninus

(Figs. 41, 51, 61, 62)

Megalomyrmex leoninus Forel, 1884: 372-373, ♀. Type Loc.: Colombia.

Lectotype designation

Lectotype and paralectotype at Museum de la Ville de Genève. Paralectotype at Museu de Zoologia da USP.

Worker

Mandibles smooth; anterior clypeal border round with median denticle; 3-segmented antennal club; frontal suture impressed; 22 ocular facets at compound eye largest diameter; occipital margin raised but not visible in head full face view; promesonotal suture impressed; mesosternum and metasternum without acrotergites; declivity smooth; epipetiolar carina complete; non-pedunculate petiole with anteroventral tooth but no flange; dorsal margin of petiolar node, in side view, concave; dorsal margin of petiole, in front-

al view, round; postpetiole ventral face without process; apex of femura acuminate.

Color: reddish-brown (gaster may be darker than rest of the body).

Comments

M. leoninus is the type species of the genus by monotypy. Its original description includes some highly variable characters as color, size and pilosity.

It was not possible to ascertain the type locality.

As I am not using the name *M. bituberculatus* (see discussion at pg. 414). Most specimens identified as such belongs to *M. leoninus*. They are: workers from Saint Augustine, Trinidad (NMNH), Maracas Valley, Trinidad and the specimens from the Museum of Comparative Zoology collection figured by Ettershank (1966).

Literature citations that used the name *M. bituberculatus* are: Wheeler (1916, 1922b, 1923) and Kempf (1959). I studied all cited specimens and identified then as *M. leoninus*. I did not examine the workers cited by Forel (1904b) collected by Goeldi at Rio Purus.

Dr. Klaus Jaffé kindly forwarded me a colony of *M. leoninus* collected by him at Cucuta, Merida, Venezuela among stones. He did not notice any definite entrances, galleries or chambers. The colony contained 450 workers and 35 males, but no immatures, nor queens.

M. leoninus presents the widest range of variation on the morphometric measurements taken (see Table 4). This variation is followed by an extreme variation in color pattern, from a bright red to a deep brown, almost black. At São Gabriel da Cachoeira, AM, Brasil, where *M. leoninus* occurs simpatrially with *M. balzani* I was not able to notice any peculiarity in relation to the other samples.

Material examined: BRASIL: *Amazonas*: Cucui 6 ♀ (MZ), 3 ♀ (MCZ), 2 ♀ (INPA); São Gabriel 1 ♀ (MZ); Uapés 2 ♀ (MNRJ), 2 ♀ (MZ). *Amapá*: Serra do Navio 1 ♀ (MZ). COLOMBIA: 2 ♀ (MVG - types), 1 ♀ (MZ - type). Rio Pance, Valle del Cauca, 1020m 2 ♀ (MZ); Prov. Boyaca 2 ♀ (MZ), 3 ♀ (FML). SURINAME: 1

♀ (MZ). TRINIDAD: Arima Valley 700m, 1 ♀ (MCZ), 1 ♀ (MZ); Blanchisuisse Rd. 8 miles, 1 ♀ (MZ); Guanapo Valley 8 ♀ (BM), 1 ♀ (MZ); Maracas Valley 1 ♀ (BM); Port of Spain 2 ♀ (MZ); Saint Augustine 1 ♀ (MZ), 1 ♀ (NMNH); Saint John, prov. Charlottesvill, Tobago, 1 ♂ (MZ); Tammass Caves 1 ♀ (NMNH), 1 ♀ (MZ). VENEZUELA: *Amazonas*: Rio Baria, 140m, 17 ♀ (FAM), 2 ♀ (MZ); San Carlos de Rio Negro 8 ♀ (MCZ), 4 ♀ (FAM), 5 ♀ (MZ). *Aragua*: Rancho Grande 3 ♀ (MZ), 1 ♂ (FAM). *Carabobo*: Palmichal, carretera Bejuma, Malaise tramp 1 ♂ (MZ), 1 ♂, 3 ♀ (FAM); San Esteban (Las Quiguas) 2 ♀ (FAM), 1 ♀ (MZ); 1 ♀ (MNHN), 1 ♀ (MCZ). *Falcón*: Haitucito, near La Maletta, Serrania S. Luis, 5 ♀ (FAM); La Hoyada, by "El Paito", near S. Luis, 1 ♂ (FAM); near Sabana de Tigre, Serrania S. Luis, 1100m, 1 ♀ (FAM); Trapichito, near Curimagua, 1 ♀ (FAM); Valle de Camburales, 1000m, 1 ♀ (FAM). *Merida*: Bailadores 3 ♂ (FAM); Bocono (5000ft) 1 ♀ (MZ); Cucuta 2000m, 2 ♀ (MVG), 2 ♀ (IRB), 9 ♀, 1 ♂ (MCZ), 4 ♀ (NMNH), 4 ♀ (BM), 21 ♀, 3 ♂ (MZ), 8 ♀ (FAM); El Jogue, Jaji, (2000 m) 1 ♂ (MZ); Finca El Cumbre 2 ♂ (FAM); La Mucuy, 2100-2600m 1 ♂ (FAM); Santa Rosa (2000 m) 8 ♀ (FAM), 6 ♀ (MZ); Timotes (8500ft) 1 ♀ (MZ). *Miranda*: Alfredo Jahn Cave, 6th mouth 3 ♀ (FAM); Pq. Nac. Guatopo (750m) 3 ♀ (MZ); Rio Capaya, Qbda. El Bagre, 10 ♀ (FAM), 2 ♀ (MZ); Rio Salerón, at Qbda. El Bagre, 23 ♀ (FAM), 3 ♀ (MZ). *Portuqueza*: via Biscucuy, La Concepción, 13 ♀ (FAM), 3 ♀ (MZ); Rio Sarare 1 ♀ (MNHN), 1 ♀ (MZ). *Tachira*: Qbda. La Blanca, via La Fria, 550m, 1 ♀ (FAM), Delicias, 1500, 1 ♂ (FAM). *Zulia*: El Tucuco (45 Km SW Machiques) 1 ♀ (MZ), 2 ♀ (FAM); Hacienda La Esperanza (carretera Maracaibo - Machiques, KM 104) 1 ♂ (MZ), 1 ♂ (FAM).

Megalomyrmex pacova, sp.n.

(Figs. 46, 55)

Megalomyrmex pacova, sp.n., ♀. Type specimens came from banana shipments arrived at U.S. Quarentine ports (Charleston, South Carolina; Brownsville, Texas and New York, NY).

Types

Holotype and 3 paratypes at Museu de Zoologia da USP; 2 paratypes at National Museum of Natural History, Washington; 2 paratypes at Museum of Comparative Zoology, Harvard.

Worker

Mandibles smooth; anterior clypeal border round with median denticle; 18 ocular facets at compound eye largest diameter; 3-segmented antennal club; occipital margin raised; frontal suture impressed; promesonotal suture impressed; mesosternum and metasternum without acrotergites; dorsal face and declivity of propodeum meeting in low lateral tubercles, divergent at apex; dorsal face impressed transversally; declivity with concentric striations around the foramen; epipetiolear carina complete; pedunculate petiole in general without anteroventral tooth or flange; dorsal margin of petiolar node, in side view, concave; dorsal margin of petiolar node, in frontal view, round; ventral face of postpetiole with a low round process; apex of femura acuminate.

Color: deep-brown, almost black.

Comments

M. pacova, sp.n., has been named after the Tupi word *pacova*, meaning banana. This species can be clearly distinguished from all other *Leoninus* group species by the lack of an anterior tooth at the petiole ventral face and by the head shape depicted at Fig. 55.

Megalomyrmex staudingeri

(Figs. 42, 57, 73, 81)

Megalomyrmex staudingeri Emery, 1890: 22, ♀.

Type Loc.: Iquitos, Loreto, Peru (03° 44'S, 73° 12'W).

Megalomyrmex leoninus var. *nasutus* Forel, 1912: 13, ♀. Type Loc.: Santo Antonio do Içá, AM, Brasil (03° 05'S, 68° 00'W). *Nov. syn.* (types examined - 2 ♀ at Muséum de la Ville de Genève).

Type

Holotype at Museo Civico di Storia Naturale "Giacomo Doria", Genova.

Worker

Mandibles smooth; anterior clypeal border straight with median denticle; 3-segmented antennal club; frontal suture impressed; 24 ocular facets at compound eye largest diameter; occipital margin raised; promesonotal suture generally not impressed dorsally, mesosternum and metasternum without developed acrotergites; dorsal face and declivity of propodeum meeting in a gentle angle, not forming lateral tubercles; dorsal face not transversally impressed; declivity smooth; epipetiolear carina complete; pedunculate petiole with anteroventral denticle originating a translucent longitudinal flange; dorsal margin of petiolar node, in side view, straight; petiolar spiracles laterally produced; dorsal margin of petiolar node, in frontal view, round; ventral face of postpetiole without process; apex of femura acuminate (Fig. 81).

Color: deep-brown, almost black.

Comments

M. staudingeri has also been described in Emery's key (1890). The sum of characters stated by Emery do not apply entirely to this species, specially as to the head shape, degree of concentric striation around the compound eyes and length of petiole.

At the original description of *M. leoninus* var. *nasutus* Forel compared this variety with *M. leoninus*, but stated that this form may be closed to *M. staudingeri* he had not the opportunity to study. My observations led me to conclude that *M. leoninus* var. *nasutus* is identical to *M. staudingeri*. A worker from Benjamin Constant bears two manuscript labels by W.L. Brown Jr. identifying as "*M. staudingeri* Em comp. with type, 1963" and "*M. leoninus nasutus* comp. with type".

Within the series from Santo Antonio do Içá I found a gamergate with 3 ocelli, the flat mesonotum clearly separate from other tergites, petiolar node compressed and the gaster distinctly swollen.

The specimen from Iquitos come from bromeliads intercepted at the Miami Airport.

Some characters show intraspecific variation. They are: degree of striation around antennal sockets, propodeum shape and the median area of clypeus, which can be shaped as a flat triangular plate. This condition is extreme at the types

of the variety described by Forel, but not exclusive.

Material examined: BRASIL: *Amazonas*: Benjamin Constant 1 ♀ (MZ), 1 ♀ (MCZ); Santo Antonio do Içá 2 ♀ (MVG - types of *M. leoninus* var. *nasutus* Forel, 1912), 3 ♀ (MZ). COLOMBIA: *Amazonas*: Leticia 4 ♀ (MCZ). PERU: *Loreto*: Iquitos 1 ♀ (MGD- holotype), 1 ♀ (MZ).

***Megalomyrmex timbira*, sp. n.**

(Figs. 45, 59)

Megalomyrmex timbira, sp.n., ♀. Type Loc.: La Flautera, ca. Palmira, Tachira, Venezuela, 1200m (07° 51'N, 72° 13'W).

Types

Holotype and paratype at Museu de Zoologia da USP; paratype at Facultad de Agronomia de Maracay, Venezuela.

Worker

Mandible smooth; anterior clypeal border straight without median denticle; 3-segmented antennal club; frontal suture impressed; 18 ocular facets at compound eyes largest diameter; promesonotal suture impressed dorsally; dorsal face and declivity of propodeum meeting, in side view, in a 120° angle, forming nonsharp teeth in lateral view; declivity smooth and non-depressed longitudinally; mesosternum and metasternum without acrotergites; epipetiole complete; non-pedunculate petiole with anteroventral denticle; dorsal margin of petiolar node, in side view, concave; dorsal margin of petiolar node, in frontal view, subquadrate; ventral face of postpetiole without process; apex of femura acuminate.

Color: dark reddish-brown, almost black.

Comments

M. timbira, sp. n., can be distinguished from all other species of the *Leoninus* group by the shape of propodeum, in lateral view (Fig. 45). The type workers have been collected by John Latke, foraging isolated on the ground of a tropical forest in August, 8, 1983.

The word *timbira* means orphan in Tupi, referring to the lack of true queens in the *Leoninus* group.

Material examined: VENEZUELA: *Tachira*: Qbda. La Bermeja, Coma de R. San Cristobal, 1100m 9 ♀ (FAM), 2 ♀ (MZ); El Espinal, between Michelena and Colon, 4 ♀ (FAM), 2 ♀ (MZ); La Flautera, ca. Palmira. 2 ♀ (types - MZ), 1 ♀ (type - FAM), 4 ♀ (FAM); San Cristobal, La Parada, Los Pirineus, 7 ♀ (FAM), 2 ♀ (MZ).

Silvestrii group

M. cuatiara, sp. n.

M. mondabora, sp. n.

M. piriana, sp. n.

M. poatan, sp. n.

M. silvestrii

M. symmetochus

M. tasyba, sp. n.

Morphologically can be characterized by monomorphic workers with mandible blades with 2-3 apical teeth followed by a series of 3-12 minute denticles; palpal formula 4:3 or 3:2; anterior border of clypeus always round; clypeal median area always depressed (except in *M. cuatiara*, sp. n.): frontal suture never impressed; first funicular segment length at least twice as long as the second; 3-segmented antennal club with segments distinctly longer but not much broader than ordinary ones; frontal carina always bearing two parallel rows of long hairs, that may reach the vertex; propodeum dorsum never depressed longitudinally; metanotal groove, in general, deeply excavated; mesosternum and metasternum always smooth; dorsal border of petiolar node, in frontal view, always round; venom apparatus with a circular area of diminute spines at the apex; genual plates flat and round.

Queens of *M. symmetochus* have dental formula 1 + 4. Workers of *M. mondabora*, sp. n., have palpal formula 4:3. Both conditions, shared with species in the preceding groups, may mean retention of generalized characters from the genus basic stock.

Workers of *M. symmetochus* show characters that isolate this species from all other grouped here, as dental formula (Fig. 109) and antennal structure. Other species of the *Silvestrii* group are rather uniform morphologically, albeit easily distinguished by the features appointed in the diagnosis and key. Most new species here described

are known by few specimens, indicating how poor collected they are.

Female reproductives in this group, when known, are true winged queens. Most specimens studied came from collections within several Attini genera nests, with whom they maintain apparent lestoproterotrophic relationships. Summing up all informations from museum catalogs, labels and literature records, however, I verified that workers also forage either individually or in groups above ground, even in species where informations on the association with Attini are copious and reliable. This suggests that either the relation is non-obligatory or that certain food items have to be obtained out of the "host"-nests. Also some free-living colonies of *M. silvestrii* have been recorded.

The geographical distribution of members of the Silvestrii group roughly follows the Attini distribution, restrained however to the limits of *Megalomyrmex* (Fig. 86).

Key to species (workers) in the Silvestrii group

- 1) A. Mandibles with 2 apical teeth2
 - B. Mandibles with 2-3 apical teeth, ventral face of postpetiole with a long sharp process*M. symmetochus*
- 2) A. Ventral face of petiole without anterior denticle or denticle not visible in petiole side view, or ventral face of petiole with transversal rugosities3
 - B. Ventral face of petiole with definite anterior denticle, and always smooth5
- 3) A. Bright-yellow species, WL < .09mm
 -*M. cuatiara*, sp.n.
 - B. Deep reddish-brown, almost shiny black species, WL > 1.15mm4
- 4) A. Mandibles with dental formula 2 + 10; palpal formula 4:3; declivity with faint rugosities; pedunculate petiole; postpetiole spiracles laterally produced
 -*M. mondabora*, sp.n.
 - B. Mandibles with dental formula 2+6; palpal formula 3:2; declivity with concentric rugosities over the foramen; non-pedunculate petiole; postpetiole spiracles not laterally produced*M. poatan*, sp.n.
- 5) A. Mandibles with dental formula, more commonly 2+10 (-12); ventral face of petiole with at least one anterior denticle in general originating a longitudinal translucent flange*M. silvestrii*
 - B. Mandibles with dental formula different from 2+10, ventral face of petiole without longitudinal flange6
- 6) A. Mandibles with dental formula 2+12; dorsal margin of petiolar node, in side view, straight; declivity with concentric rugosities; ventral process of postpetiole round*M. piriana*, sp.n.
 - B. Mandibles with dental formula 2+(3-4); dorsal margin of petiolar node, in side view, concave; declivity smooth; postpetiole without ventral process
 -*M. tasyba*, sp.n.

Megalomyrmex cuatiara, sp.n.

(Figs. 93-94, 103)

Megalomyrmex cuatiara, sp.n., ♀, ♀. Type Loc.: 7 Km NW Leticia, Bolivar, Colombia (04° 09'S, 69° 57'W) (Holotype and paratype); Villagarzon, Putumayo, Colombia (01° 02'N, 76° 37'W) (15 paratypes); Villavicencio, Meta, Colombia (04° 10'N, 73°, 37'W) (4 paratypes); Quebrada Susamuko, 23 Km NW Villavicencio, Meta, Colombia (1 paratype).

Types

Holotype (♀) and paratype (♀) from Leticia, 1 paratype (♀) from Quebrada Susamuko, 2 paratypes (♀) from Villavicencio and 6 paratypes (1 ♀, 5 ♀) from Villagarzon at Museu de Zoologia da USP; 2 Paratypes (♀) from Villavicencio and 3 paratypes (♀) from Villagarzon at the Museum of Comparative Zoology; 6 paratypes (♀) from Villagarzon at the British Museum.

Worker

Mandibles smooth, dental formula 2 + 5 (irregular denticles); palpal formula 3:2; anterior clypeal border without median denticle or depression; 8-11 ocular facets at largest diameter of compound eye, which occupy more than 1/3 of head lateral margins in full face view, interrupting head profile; occipital margin not raised; promesonotal suture not impressed dorsally; katepisternum with gross longitudinally oriented

Table 5. Measurements of *Megalomyrmex* of the Silvestrii group (in mm) - Types

♀ holotype or lectotype	HW	HL	ML	SL	WL	PL	PW	pPL	pPW	HFL	GL	TL
<i>M. cuatiara</i> , sp. n. holotype	.48	.50	.25	.63	.73	.35	.15	.18	.20	.60	.80	2.81
<i>M. mondabora</i> , sp. n. holotype	.73	.80	.45	1.00	1.30	.50	.25	.28	.33	1.18	1.28	4.61
<i>M. piriana</i> , sp. n. holotype	.63	.78	.43	.90	1.18	.48	.25	.28	.25	1.23	.95	4.10
<i>M. poatan</i> , sp. n. holotype	.70	.85	.40	.85	1.30	.55	.30	.25	.35	1.00	1.00	4.35
<i>M. silvestrii</i> holotype	.70	.83	.43	.95	1.35	.55	.30	.33	.38	1.15	1.40	4.89
<i>M. symmeto-</i> <i>chus</i> lectotype	.73	.80	.45	.78	1.15	.48	.30	.25	.38	.93	1.25	4.38
<i>M. tasyba</i> , sp. n. holotype	.75	.80	.45	.98	1.30	.53	.25	.30	.33	1.10	1.15	4.53

Table 6. Measurements of *Megalomyrmex* of the Silvestrii group (in mm).

♀	N	HW	HL	SL	WL
<i>M. cuatiara</i> , sp. n. paratypes	18	.48- .58	.50- .58	.63- .75	.73- .83
<i>M. mondabora</i> , sp. n. paratypes	4	.70- .75	.80- .85	.93-1.00	1.18-1.20
<i>M. piriana</i> , sp. n. (holotype-paratype)	2	.63	.78	.90- .95	1.18
<i>M. silvestrii</i> several localities	30	.60- .73	.71- .88	.83-1.08	1.08-1.45
<i>M. symmetochus</i> several localities	30	.60- .75	.75- .83	.73- .80	1.15-1.28
<i>M. tasyba</i> , sp. n. (holotype-paratype)	2	.73- .75	.80	.98	1.28-1.30

rugosities; metanotal groove rugose at dorsal region; propodeum dorsal profile continuous; declivity with concentric rugosities over the foramen; epipetiolear carina complete; dorsal margin of petiolear node, in side view, concave; ventral face of petiole with transversal rugosities but no denticle or flange; ventral process of postpetiole globose.

Pilosity: very long hairs (ca. .2mm) at body dorsum, smaller hairs (less than 1mm) at scapes and legs. Funiculus with short and appressed pubescence.

Color: bright yellow.

Queen

Three equally developed ocelli; mesonotum with parapsidal sutures but no notaulus; katapisternum smooth; ventral face of petiole with anteromedial denticle (Fig. 103).

Comments

M. cuatiara, sp. n., could have been assigned to the *Pusillus* group by the head shape and relative size of compound eyes. I preferred, however, to include it in this group by the shape of the antennal club segments and that of the petiolear and postpetiolear nodes.

This species can be easily distinguished from all other of the *Silvestrii* group by the rugosities covering entirely the metanotal groove and in part the katapisternum (the name *cuatiara* in Tupi refers to these rugosities). Also the clypeal shield is not depressed.

The types from Leticia have been collected by the Peck couple from Berlesate samples (collection n° 25) between 20 and 25 of February, 1972. The same collected the types from Villavicencio and Quebrada Susamuko, respectively collection numbers 233 ("forest litter") in 1 - 4, March, 1972 and 234 in, March, 5, 1972.

The sample from Villagarzon has been collected by C. Jackson and bears locality labels with two different collection dates (August, 14, 1977 and March, 24, 1977). Both workers and queen from this locality have maximum values in the species variation range in all measured characters.

***Megalomyrmex mondabora*, sp. n.**

(Figs. 95, 96)

Megalomyrmex mondabora, sp. n., ♀. Type Loc.: 3 - 5Km E, Turiaba, Rio Raventado, Costa Rica (09° 54'N, 83° 41'W) (Holotype and 4 paratypes); Vilhena, RO, Brasil (12° 43'S, 60° 07'W) (Paratype).

Types

Holotype and 2 paratypes from Turiaba at Museum of Comparative Zoology, Harvard.; 1 paratype from Turiaba and 1 paratype from Vilhena at Museu de Zoologia da USP.

Worker

Mandibles smooth, dental formula 2+10; palpal formula 4:3; anterior clypeal border without median denticle; 13 ocular facets at compound eye largest diameter; occipital margin raised; promesonotal suture not impressed dorsally, mesonotum distinguished from pronotum as a swollen area; metanotal groove entirely rugose; katapisternum smooth; propodeum spiracles laterally projected in an angle of 45° from the main axis of the body; declivity in general faintly rugose; epipetiolear carina complete; pedunculate petiole with dorsal margin of node, in side view, concave and ventral face with a anteromedian minute denticle originating a non-translucid longitudinal flange; dorsal margin of petiolear node, in frontal view, round; ventral process of postpetiole rugose.

Color: mandibles, antennae and legs brown. Anepisternum, katapisternum and propodeum black, with the rest of the body reddish-brown dark and shiny.

Comments

The propodeum spiracles, lack of subpetiolear denticle and palpal formula 4:3 completely separate *M. mondabora*, sp. n., from all other species in the *Silvestrii* group.

The types of Turiaba, collected by W. L. Brown Jr. between 18 and 22 of January, 1973, were found associated with workers of an unidentified *Apterostigma* (Attini). Therefore I choosed the name *mondabora*, meaning robber in Tupi.

The paratype from Vilhena (Kempf collection n° 10221) have gross rugulae partially covering the katapisternum and darker legs. In all other characters, however, it is identical to the Turiaba specimens.

Magalomyrmex piriana, sp.n.

(Figs. 97-98)

Megalomyrmex piriana, sp.n., ♀. Type Loc.: Tinalandia, 16Km SE Santo Domingo de los Colorados, prov. Pichincha, Ecuador (00° 18'S, 79° 04'W).

Types

Holotype and paratype at the Museum of Comparative Zoology, Harvard. Paratype at Museu de Zoologia da USP.

Worker

Mandibles smooth; dental formula 2+12; palpal formula 3:2; anterior clypeal border without median denticle; 13 ocular facets at compound eyes largest diameter; promesonotal suture faintly impressed laterally but not dorsally; metanotal groove deeply excavated and completely rugose; declivity with faint rugosities over the foramen; propodeal spiracles, in side view, laterally produced; epipetiolear carina complete; pedunculate petiole with dorsal margin, in lateral view, straight; ventral face of petiole with anteromedian denticle, but no longitudinal flange; ventral process of postpetiole globose.

Pilosity: long hairs (ca. 2mm) at head, thorax dorsum and gaster, smaller hairs (ca. 1mm) at legs.

Color: antennae and legs orange-yellow; body bright-light brown. Base of head light-brown, vertex almost black.

Comments

Megalomyrmex piriana, sp.n., can be distinguished from *M. silvestrii* by the laterally produced propodeal spiracles and the sculptured metanotal groove. The latter character suggested the name *piriana*, meaning striped in Tupi. The mesonotum of *M. piriana*, sp.n., cannot be distinguished from the pronotum in side or dorsal view.

The type series has been collected by J. & S. Peck in April, 4, 1976.

Megalomyrmex poatan, sp.n.

(Figs. 99,100)

Megalomyrmex poatan, sp.n., ♀. Type Loc.: San Pedro de la Sierra, Pico Yerbabuena (1730m), Magdalena, Colombia (05° 33'N, 74° 37'W).

Type

Holotype at Museum of Comparative Zoology, Harvard.

Worker

Mandibles smooth; dental formula 2+6; palpal formula 3:2; median area of clypeus depressed, but not marked by lateral carinae; anterior clypeal border without a clearly defined denticle; region between compound eyes and antennal sockets with concentric sculptures; 10 ocular facets at compound eyes largest diameter; occipital margin not raised; promesonotal suture not impressed dorsally, promesonotum profile continuous; metanotal groove very deep and wide; base of dorsal face of propodeum higher than the metanotum in side view; katapisternum smooth; dorsal face and declivity indistinct; declivity with rugosities over the foramen; non-pedunculate petiole with anteventral denticle followed by a series of transversal rugosities covering the whole ventral face; posterior slope of petiolar node rugose; postpetiole lower and broader than the petiole with ventral process small and globose.

Pilosity: only long hairs (ca. 2mm) all over the body surface, more common at dorsum, legs and scapes.

Color: bright reddish-brown with yellowish club of funiculus, coxae and trochanters.

Comments

The unique specimen of this rather different species has been collected by C. Kugler from a Berlesate sample in February, 18, 1977.

The sculpture pattern, head shape (Fig. 100) and the deeply excavated metanotal groove clearly distinguish this species from all other *Megalomyrmex*. The characteristic head shape led me to use the name *poatan*, straight head in Tupi.

Megalomyrmex silvestrii

(Figs. 87, 88, 101, 102, 106, 108, 109)

Megalomyrmex silvestrii Wheeler, W.M., 1909: 235-6, ♀. Type Loc.: Cordoba, Veracruz, Mexico (18° 50'N, 90° 50'W).

Megalomyrmex (Wheelerimyrmex) sjöstedti Wheeler, W.M., 1925b: 30-31, ♀, ♀. Type Loc.: Llinquipata, Peru (13° 49'S, 70° 38'W).

Synon. Kempf & Brown, 1968: 97-99. 10 syntypes (1 ♀, 9 ♂) Riksmuseet, Stockholm and Museum of Comparative Zoology, Harvard examined.

Megalomyrmex (Wheelerimyrmex) sjöstedti var. *langi* Wheeler, W.M., 1925 b: 30-32, ♀, ♂. Type Loc.: Kamakusa, Guiana (05° 56'N, 59° 54'W). Synon. Kempf & Brown, 1968: 97-99. 4 syntypes (♀) Riksmuseet, Stockholm; 3 (♀) Museum of Comparative Zoology, Harvard and 3 (♀) National Museum of Natural History, Washington (n° 59587) examined.

Megalomyrmex brasiliensis Borgmeier, 1930: 34-35, pl. 5, figs. 33-35, ♀. Type Loc.: Gaspar, Santa Catarina, Brasil (26° 56'S, 48° 58'W). Synon. Kempf & Brown, 1968: 97-99. 3 "Cotypus" (♀) Museu de Zoologia de USP; 3 (♀) Instituto Biológico de São Paulo and 1 (♀) Museu Nacional do Rio de Janeiro examined.

Megalomyrmex (Wheelerimyrmex) brasiliensis var. *misionensis* Santschi, 1936: 405, ♀. Type Loc.: Misiones, Loreto, Argentina, (27° 29'S, 55° 32'W). Synon. Kempf & Brown, 1968: 97-99. 1 "Cotypus" (♀) Naturhistorisches Museum, Basel; 3 (♀) Fundación Miguel Lillo, Tucuman and 1 (♀) Museu de Zoologia da USP examined.

Megalomyrmex (Cepobroticus) wheeleri Weber, 1940: 425-7, figs. 15-16, ♀, ♂. Type Loc.: Barro Colorado Island, Canal Zone, Panamá (09° 10'N, 79° 51'W). Synon. Kempf & Brown, 1968: 97-99. 1 "Tipo" (♀) Museum Comparative Zoology, Harvard and 1 (♀) National Museum of Natural History, Washington examined.

Type

Holotype (♀) at Museum of Comparative Zoology, Harvard.

Worker

Mandibles smooth with 2 apical teeth followed by a series of 10-12 denticles; palpal formula 3:2; anterior border of clypeus without median denticle, median area depressed but not marked by lateral carinae; scape always surpassing the vertex in frontal head view; 10-12 ocular facets at compound eyes largest diameter; occipital margin raised and visible in head full face;

promesonotal suture not impressed dorsally; metanotal groove smooth; propodeum may be raised over the metanotal groove in lateral view of the trunk; dorsal face and declivity of propodeum meeting in a gentle angle; declivity with one or two concentric rugosities over the foramen; propodeum spiracles never laterally produced; epipetiolear carina complete; inferior propodeal plates may be quadrate in side aspect; pedunculate petiole with anterior margin of node concave in side view; ventral face with 1 or rarely up to 3 anterior denticles, in general leading to a translucent longitudinal flange; dorsal margin of petiolear node round in frontal view, without an apex; ventral process of postpetiole globose.

Pilosity: long hairs (longer than .15mm) at head, thorax dorsum, gaster and legs (coxae and femora); smaller hairs (ca. .1mm) at antennae and rest of legs.

Color: mandibles, clypeus, antennae and legs in general bright yellow. Rest of body bright reddish-brown.

Comments

Wheeler (1909) described *M. silvestrii* upon 4 workers collected by Silvestri at Cordoba, Mexico. Wheeler's collection has been divided between Harvard and Washington museums. I examined both collections and found only one worker clearly labelled as "cotypus" at the Museum of Comparative Zoology, which is then the holotype.

I examined all types of the species already synonymized by Kempf & Brown (1968) under *M. silvestrii*. I agree with them that the differences among the specimens may represent "erratic local trends in the same species". The similarities among the series are much more impressive than the differences.

The specimens listed by these authors from Igarapé Marianil, 23Km NE of Manaus, AM, Brasil (collected by W.L. Brown under a small rotten trunk, within a small chamber of an unidentified *Trachymyrmex*) do not belong however to *M. silvestrii*, but to *M. symmetochus*. Kempf (1970) already noticed that these specimens have the shape of the postpetiolear node different of the typical *M. silvestrii*.

Kempf & Brown (1968) suggested that *M. silvestrii* may not be a "parasite", but rather a

predator that, employing mass recruitment, became specialized in attacking and sometimes occupying small Attini nests.

Summing all available informations it seems to me that this species maintain non-specific and non-obligatory lestoprobiotic relationships with small Attini. J. L. Diniz collected isolated nests of *M. silvestrii* at Betim, MG, Brasil, while N. Weber (1941) collected founding queens of the same within nests of *Cyphomyrmex costatus*. Several colonies collected by W.L. Brown at Barro Colorado, CZ, Panama and Santa Teresa, ES, Brasil were found nesting isolated.

As already noticed by Brown & Kempf (1968) *M. silvestrii* presents intraspecific variation as to color, proportion of the non-clubbed antennal segments, size of compound eyes, Weber's length of thorax and shape of the inferior propodeal plates. It was not possible, however, to correlate any of these variations with the distribution of the species.

Material examined: ARGENTINA: *Cruz Alta*: La Soledad (Cañeta) 1 ♀ (MZ). *Loreto*: Misiones ("cotypus" of *M. brasiliensis* var. *misionensis* S.) 3 ♀ (FML), 1 ♀ (NMB), 2 ♀ (MZ). BOLIVIA: *Beni*: Covendo 1 ♀, 8 ♀ (MZ), 12 ♀ (NMNH), 9 ♀ (MCZ), 5 ♀ (BM). BRASIL: *Espírito Santo*: Pq. Nac. Sooretama, Linhares, 6 ♀ (MZ), 3 ♀ (MCZ); Linhares 3 ♂ (MZ); Santa Teresa (700m), 6 ♀ (MCZ), 2 ♀ (MZ). *Goiás*: Campinas 2 ♀ (MZ); Pires do Rio 2 ♀ (MZ). *Mato Grosso*: Sinop 2 ♀ (MZ); Vila Vera 1 ♂ (MZ). *Mato Grosso do Sul*: Faz. do Cervo, Três Lagoas, 3 ♀ (MCZ), 2 ♀ (BM), 2 ♀ (NMB), 2 ♀ (NMNH), 23 ♀ (MZ); R. Suciuri, Corr. Chupão, Três Lagoas, 1 ♂ (MZ); Faz. Dr. J. Mendes, Três Lagoas, 1 ♀, 8 ♀ (MZ), 1 ♀, 2 ♀ (MCZ); Serra do Urucum, Corumbá, 1 ♂ (MZ). *Minas Gerais*: Betim 1 ♀, 11 ♀ (MZ), 4 ♀ (JLD), 3 ♀ (MCZ), 2 ♀ (NMNH). *Paraná*: Bocaiuva 1 ♀ (MZ). *Pernambuco*: Caruaru 1 ♂ (MZ). *Rio de Janeiro*: Angra dos Reis 1 ♀, 46 ♀ (MZ); Corcovado 1 ♀, 1 ♀ (MCZ), 1 ♀, 6 ♀ (MZ), 3 ♀ (NMNH); Repr. Rio Grande 2 ♂ (MZ); Pão de Açúcar 1 ♀ (MZ). *Rondônia*: Vilhena 1 ♂ (MZ). *Santa Catarina*: Gaspar ("cotypus of *M. brasiliensis* B.) 3 ♀ (MZ), 3 ♀ (IB), 1 ♀ (MNRJ); Nova Teutonia 3 ♂, 2 ♀, 1 ♀ (MZ); Xaxim 1 ♀

(MZ). *São Paulo*: Grota, Mirassol, 15 ♀ (MZ), 6 ♀ (FML). BELIZE: Caves Branch 3 ♀ (MCZ), 2 ♀ (MZ); Hummingbird Gap, 45Km N Stann Creek (450m), 4 ♀ (MCZ), 2 ♀ (MZ); 25mi. S of Belmopan, 1 ♀ (MZ). COLOMBIA: *Bolívar*: 7 Km N Leticia 1 ♀ (MZ); Pq. Tayronna, ca. Pueblito, 1 ♀ (MZ). COSTA RICA: *Santa Clara*: Bataam 1 ♀ (MZ). ECUADOR: *Napo*: Limoncocha 2 ♀ (MCZ); Puyo 3 ♀ (MCZ), 2 ♀ (MZ); 47 Km S Sto. Domingo, R. Palenque, 1 ♀ (MZ). GUIANA: Kamakusa ("syntypes" of *M. sjöstedti* var. *langi* W.) 4 ♀ (RM), 3 ♀ (MCZ), 3 ♀ (NMNH). HONDURAS: La Ceiba 9 ♀ (NMNH), 3 ♀ (FML), 18 ♀ (MZ), 3 ♀ (MCZ); La Lima 1 ♀, 2 ♀ (MZ), 9 ♀ (MCZ); San Juan Pueblo 1 ♀, 5 ♀ (MZ), 15 ♀ (NMNH), 3 ♀ (BM), 3 ♀ (MCZ). MEXICO: *San Luis Potosí*: Huichuican 3 ♀ (NMNH), 3 ♀ (FML), 1 ♀ (MZ). *Vera Cruz*: Cordoba (type of *M. silvestrii* W.), 1 ♀ (MCZ). PANAMA: Barro Colorado: 2 ♀, 14 ♀ (NMNH), 1 ♀, 10 ♀ (MCZ), 1 ♀, 11 ♀ (MZ), (type of *Cepobroticus* Web.) 1 ♀ (MCZ), 1 ♀ (NMNH); Cerro Azul (610m), 1 ♀ (MCZ); Cerro Campana 2 ♀ (MCZ); Gamboa 2 ♀ (MZ). PERU: Llinquipata ("syntypes" of *M. sjöstedti* W.) 1 ♀, 6 ♀ (RM), 3 ♀ (MCZ), 3 ♀ (MZ); Valle Chanchamayo, 1 ♀ (MZ); Lake Sandoval 1 ♀ (MCZ). SURINAME: Dirkshoop 1 ♀ (MZ). VENEZUELA: *Miranda*: Carizales 5 ♀ (MZ), 1 ♀ (MCZ). *Monagas*: Caripe 10 ♀ (MZ), 5 ♀ (FAM). TRINIDAD: Caroni Swamp 1 ♀ (BM); Curepe 1 ♀ (BM); Nariva Swamp 2 ♀ (MCZ), 2 ♀ (MZ); Tobago, prov. Charlottesville, St. John, 1 ♀ (MZ).

Megalomyrmex symmetochus

(Figs. 89, 90, 104, 105, 107)

Megalomyrmex symmetochus Wheeler, W. M., 1925a: 168, fig. 5, ♀, ♀, ♂. Type Loc.: Barro Colorado Isl., Canal Zone, Panama (09° 10'S, 79° 51'W). Wheeler, G.C., 1948: 672, Fig. 1, D-F; Wheeler G.C. & Wheeler, J., 1955: 126-7, pl. III, figs. 7-11, larvae.

Lectotype designation

Lectotype (♀) and 5 paralectotypes (♀) at Museum of Comparative Zoology, Harvard

(n° 1476-209-08); 5 paralectotypes (♀) at National Museum of Natural History, Washington; 4 paralectotypes (1 ♀, 3 ♀) at Museu de Zoologia da USP.

Worker

Mandibles striate with dental formula (2-3) + (3-4); palpal formula 3:2; anterior clypeal border without median denticle; median area of clypeus depressed; 8-10 ocular facets at compound eyes largest diameter; occipital margin not raised in head frontal view; promesonotal suture not impressed dorsally, promesonotum evenly round in side view; metanotal groove sculptured at dorsum and not deep; dorsal face and declivity of propodeum indistinct; declivity smooth; epipetiolear carina incomplete; ventral face of petiole with anterior denticle and a longitudinal translucent flange; anterior margin of petiolar node straight in side view, dorsal margin of node round in frontal view; postpetiole spiracles laterally produced; ventral process of postpetiole in a sharp tooth.

Pilosity: long (.2 - .3mm) erect and bright hairs evenly distributed all over the body.

Color: scape, mandibles, ventral faces of petiole and postpetiole and gaster apex bright orange. Rest of body bright yellow.

Comments

The type series has been collected within the fungus chamber of nests of *Sericomyrmex amabilis* Wheeler by the species author in two dates in July, 1924.

I was not able to locate the males of this series, but have studied males from various localities to compare with the original description. I should add that the dental formula is 1 + 3; the ocellar triangle is remarkably dark; the mesonotum bears parapsidal sutures; the declivity has concentric striations over the foramen; the epipetiolear carina is not complete and the postpetiole is twice as broad as the petiole in dorsal view.

Queens of *M. symmetochus* have the mandibles identical to that encountered in workers and queens of the *Modestus* and *Leoninus* groups, i.e., an apical tooth clearly larger than the following 4 denticles. In general queens of this species have the epipetiolear carina complete and the declivity marked by concentric rugosities. This

condition may suggest that *M. symmetochus* retained some generalized characters from the genus basic stock. The rather abundant pilosity is a specialization and could be associated with the lestoprotophagous habit of this species. If this interpretation is correct the acute ventral process of the postpetiole and the laterally produced spiracles arised independently in the species groups.

Wheeler, W.M. (1925a:162) observed that the guest *M. symmetochus* keep the brood in small groups scattered within the fungus chamber of its host nests (*S. amabilis*). Each group of immatures received care of a small group of workers. He never observed workers of the host species caring larvae of the guest ants. These observations were confirmed by Weber (1941). Wheeler, G.C. (1948) and Wheeler, G.C. & Wheeler J. (1955) figured the larvae of both species.

The specimens from Ipean, Belém, PA, Brasil came from a nest of an unidentified *Trachymyrmex*.

Head shape of workers and queens can vary among the series as well as the area covered by superficial sculptures.

Material examined: BOLIVIA: Beni: Tumupasa 1 ♀ (MZ). BRASIL: Amazonas: Manaus 6 ♀, 8 ♀, 7 ♂ (MZ), 1 ♀, 1 ♂, 2 ♀ (MCZ), 1 ♀, 1 ♂, 2 ♀ (NMNH); Igarapé Marianil, 23Km NE Manaus, 2 ♀, 1 ♂, 6 ♀ (MCZ), 1 ♀, 1 ♂, 6 ♀ (MZ). Goiás: Araguacema 1 ♀, 3 ♂ (INPA), 1 ♀, 3 ♂ (MZ). Mato Grosso: Barra do Tapirapé 1 ♀ (MZ); Sinop 3 ♀, 1 ♂ (MZ); Serra do Urucum 1 ♀ (MZ); Vila Vera 1 ♀ (MZ). Pará: Belém (APEG - Ipean), 1 ♀, 11 ♀ (MZ), 3 ♀ (MCZ); Utinga 1 ♀ (MZ). Rio de Janeiro: Floresta da Tijuca 2 ♀, 2 ♂ (MZ). Rondônia: Jiparaná 1 ♂, 1 ♀ (INPA), 1 ♀ (MZ). Santa Catarina: Nova Teutônia 2 ♀ (MZ). COSTA RICA: Hamburg Farm 1 ♀ (MZ). PANAMA: Barro Colorado, Canal Zone, 5 ♀ (NMNH - types), 6 ♀ (MCZ - types), 1 ♀, 3 ♀ (MZ - types), 1 ♂ (AMNH); Cabima, 1 ♂ (MZ).

Megalomyrmex tasyba, sp.n.

(Figs. 91, 92)

Megalomyrmex tasyba, sp. n., ♀. Type Loc.: Limoncocha, Napo-Pastaza, Ecuador (00° 24'S, 76° 36'W).

Types

Holotype at Museu de Zoologia da USP and paratype at Museum of Comparative Zoology, Harvard.

Worker

Mandibles smooth with dental formula 2 + (3-4); palpal formula 3:2; anterior clypeal border without denticle; median area of clypeus depressed but not marked by lateral carinae; occipital margin not raised; promesonotal suture faintly impressed; dorsal face and declivity of propodeum indistinct; declivity smooth; epipetiolear carina incomplete; inferior propodeal plates quadrate in side view; pedunculate petiole with anterior margin curve in side view; dorsal margin of petiolar node round in frontal aspect with a small prominence at the center; ventral face of petiole with an anterior denticle but no longitudinal flange; ventral process of postpetiole globose.

Pilosity: long erect and bright hairs (ca. .15mm) at head, dorsum of thorax and pedicel and covering the gaster. Smaller subdecumbent hairs at legs.

Color: reddish brown except for the yellowish legs, mandibles and antennal club.

Comments

The types have been collected by C.W. Rettenmeyer in August, 3, 1972 (accession number 4911, colony F - 163). *M. tasyba*, sp. n., can be distinguished from all other species of this group by the diagnosis presented above. The word *tasyba* is one of the names for ants in general in Tupi.

Pusillus group

M. drifti

M. gnomus

M. incisus

M. miri, sp. n.

M. myops

M. pusillus

Workers of this group may be monomorphic or present primary allometry (WL = .75 - 1.25mm) with smooth slender mandibles with 1-3 apical teeth followed by a variable series of subequal denticles (3-7); median area of clypeus always depressed and sometimes marked later-

ally by carinae; anterior clypeal border with up to 4 denticles, the inner ones originating the carinae (Fig. 121); palpal formula 3:2 (Fig. 125) (except *M. gnomus* with 3:1), first funicular segment length always at least twice the second; 3-segmented antennal club, the segments involved distinctly broader and longer than the preceding ones; compound eyes relatively large occupying generally 1/3 of the head capsule in full face view, with 5-15 ocular facets at their largest diameter; mesosternum and metasternum without acrotergites; genual plates round; apex of venom apparatus spatulate (Fig. 128).

In general workers and true queens dorsum of head hairs are longer than ordinary body hairs and inclined toward the head longitudinal axis.

Species of *Pusillus* group live in colonies with true queens (Figs. 132-134) or else with gamergates, as in *M. drifti* and *M. incisus*. These two species show the higher degree of variation in the morphometric characters studied for the whole genus. This situation may also be related to the presence of gamergates as in Ward (1983) observations in *Rhytidoponera*.

The species assembled in this group are the smallest in *Megalomyrmex* (Table 7). They nest within the litter of forested areas in the tropical Americas and are mostly known from Berlesate samples, a particularly poorly known segment of the Neotropical ant fauna.

As most samples are represented by just a few individuals, collected at sparse localities, an interpretation of their distributional pattern at this moment would be premature (Fig. 135).

The *Pusillus* group includes species with a number of characters I considered derived, specially the falcate mandibles in some species, the very distinct antennal club, loss of palpal segments and the peculiar shape of the venom apparatus apex.

Key to species (workers) in the *Pusillus* group

- 1) A. Slope of petiolar node straight in side view; petiolar and postpetiolar node widths nearly identical in dorsal view; dark species; anterior clypeal border never with denticles (Figs. 113-114).....
.....*M. incisus*

- B. Slope of petiolar node concave in side view; petiolar node narrower than postpetiolar node in dorsal aspect2
- 2) A. Anterior border of clypeus with 2 to 4 denticles (from the innermost denticles arise 2 carinae limiting the median clypeal depression); deep brown or black ants*M. drifti*
- B. Median area of clypeus not limited by lateral carinae; anterior clypeal border without denticles; bright yellow ants3
- 3) A. Dental formula 2+4, 2+5 or 1+64
- B. Dental formula 2+6 or 3+35
- 4) A. Anterior clypeal border round; genae sculptured; 5 ocular facets at compound eye largest diameter; dental formula 2+5 or 1+6; promesonotal suture not impressed dorsally; declivity with concentric rugosities over the foramen; slope of petiolar node straight in side view; subpetiolar longitudinal flange marked by transverse rugosities
.....*M. miri*, sp.n.
- B. Anterior clypeal border straight; genae smooth; 13 ocular facets at compound eye largest diameter diameter; dental formula 2+4; promesonotal suture impressed dorsally; declivity smooth; petiolar node slope concave in side view; subpetiolar longitudinal flange not sculptured
.....*M. pusillus*
- 5) A. Dental formula 2+6, palpal formula 3:1:9 ocular facets at compound eyes largest diameter; 2 parallel rows of long hairs on the frontal carinae reaching the vertex; epipetiolar carina complete dorsally; propodeal faces meeting in a gentle angle not marked by carinae; petiolar node slope concave in side view; dorsal petiolar border subquadrate in frontal view; ventral face of petiole with anterior denticle leading to a longitudinal translucent flange; postpetiole spiracles laterally produced ..
.....*M. gnomus*
- B. Dental formula 3+ (3-5), palpal formula 3:2, 6-7 ocular facets at compound eyes largest diameter; frontal carinae without long hairs, epipetiolar carina incomplete dorsally; propodeal faces meeting in marked angle (in side view), representing

the carinate margin of the median propodeal depression; petiolar node slope straight in side view; dorsal petiolar border round in frontal view; ventral face of petiole with anterior denticle but no flange; postpetiolar spiracles not laterally produced*M. myops*

Megalomyrmex drifti

(Figs. 111, 112, 125 - 131, 133)

Megalomyrmex drifti Kempf, 1961: 504-506, figs. 9 -11, ♀, ♀ Type Loc.: Dirkshoop, Suriname (06° OO'S. 55° 30'W).

Types

Holotype (♀) and 4 paratypes (♀) at Museu de Zoologia da USP; 1 paratype (♀) and 5 paratypes (♀) probably at J. van der Drift collection (not examined); 3 paratypes (♀) at Museum of Comparative Zoology, Harvard.

Worker

Mandibles smooth with dental formula 2 + (5-7) denticles; clypeus medially depressed with lateral carinae originating from the anterior clypeal border, which can be the only present pair; frontal suture not impressed; promesonotal suture in general not impressed dorsally; propodeal faces always meeting in marked angles in side view; declivity smooth; epipetiolar carina complete dorsally; pedunculate petiole with anteroventral denticle; petiolar node slope sinuose in side view; postpetiolar node lower and broader than petiolar node, without ventral process.

Pilosity: standing or oblique hairs sparse on body; shorter, denser and subdecumbent hairs on antennae and legs.

Color: black-brown and shining species with mandibles, anterior half of clypeus, antennae and legs light brown.

Male

Reticulate striations between compound eyes and ocellar region; pedicel larger than scape and funicular segments; last funicular joint longer than preceding ones; antennae, clypeus, mandibles and legs paler than (deep brown) rest of body; mesonotum without impressions or su-

Table 7. Measurements of *Megalomyrmex* of the Pusillus group (in mm) - Types

♀ holotype or lectotype	HW	HL	ML	SL	WL	PL	PW	pPL	pPW	HFL	GL	TL
<i>M. drifti</i> holotype	.45	.60	.28	.38	.60	.23	.18	.10	.23	.40	.65	2.46
<i>M. incisus</i> 3 paratypes (mean)	.66	.67	.42	.62	.94	.43	.29	.24	.34	.79	1.08	3.78
<i>M. gnomus</i> holotype	.55	.60	.33	.53	.83	.33	.23	.18	.30	.60	.90	3.17
<i>M. miri</i> , sp.n. holotype	.48	.50	.30	.48	.75	.33	.15	.18	.20	.50	.80	2.86
<i>M. myops</i> lectotype	.70	.80	.43	.73	1.10	.40	.28	.23	.28	.73	1.13	4.09
<i>M. pusillus</i> lectotype	.73	.73	.38	.83	1.10	.43	.23	.20	.23	.93	1.08	3.92

Table 8. Measurements of *Megalomyrmex* of the Pusillus group (in mm).

♀	N	HW	HL	SL	WL
<i>M. drifti</i> several localities	20	.40- .55	.53- .65	.40- .55	.65- .80
<i>M. incisus</i> several localities	20	.65- .87	.63- .86	.63- .78	.98-1.18
<i>M. gnomus</i> (holotype-paratype)	2	.53- .55	.58- .60	.50- .53	.78- .83
<i>M. miri</i> , sp. n. (holotype-paratype)	2	.48	.50- .55	.48- .50	.75- .78
<i>M. myops</i> all workers examined	25	.65- .73	.75- .83	.70- .75	1.05-1.13
<i>M. pusillus</i> several localities	30	.63- .85	.68- .90	.68- .93	.90-1.25

tures; metanotal groove sculptured longitudinally; petiolar node depressed sagittally.

Comments

The type series has been collected by J. van der Drift in sandy soil sample taken in primary forest in October, 1959. Kempf (1961) described 13 workers and a female from this locality recorded as "experimental citrus garden 40Km W of Panamaribo".

Kempf (1970) comments the extreme intra-specific variation in size and propodeum shape among specimens recovered from Berlesate samples in different localities. He recognized three "morphoclines", although he found in the same samples (not necessarily from the same colony) from Jacupiranga, SP, Brasil specimens of two forms. I studied 36 samples from 31 localities and verified that in some of them representatives of all variants can be encountered.

I found gamergates in samples from Rio Palenque, Ecuador and Bocaiuva, PR, Brasil, from where there are also true queens. Ward (1983), suggested that workers from colonies with gamergates, have lower degrees of relationship than workers from colonies with true queens. The extreme variation of morphometric characters within *M. drifti* may be related to the presence of gamergates or else true queens.

I noticed variation as to the presence of 2 or 4 anterior clypeal denticles and also on the degree of impression between the clypeal carinae.

Material examined: BRASIL: *Mato Grosso*: Utiariti, Rio Papagaio, 1 ♀ (MZ). *Paraná*: Bocaiuva 1 ♀, 29 ♀ (MZ), 4 ♀ (BM) (MCZ); Laranjeiras 7 ♀ (MZ); Rio Azul 1 ♀, 2 ♀ (MZ). *Rio de Janeiro*: Floresta da Tijuca 1 ♀ (MZ); Itatiaia 1 ♀ (MZ). *Rio Grande do Sul*: Barros Casal 1 ♀, (MZ); Morro Reuter 1 ♀ (MZ); Nova Petrópolis 8 ♀ (MZ); Sinimbu 1 ♀, 8 ♀ (MZ). *Santa Catarina*: Chapecó 3 ♀ (MZ); Nova Teutônia 2 ♀ (MZ); *São Paulo*: Faz. Itaquerê, Tabatinga, 1 ♀, 1 ♀ (MZ); Faz. Serra, Itu 1 ♀ (MZ); Jacupiranga 5 ♀, 7 ♀ (MZ); Serra da Cantareira 1 ♀ (MZ); Serra de Agudos 1 ♀ (MZ). COLOMBIA: *Bolívar*: 7Km N Leticia 1 ♀ (MCZ). *Magdalena*: Parque Tayronna, Pueblito limite Sur, 210-360m, 1 ♀, 2 ♀ (MCZ); 1 ♀ (MZ). *Meta*: Quebrada Susamuko,

23Km Villavicencio, 1.000m litter 3 ♀ (BM), 1 ♀, 4 ♀ (MCZ), 4 ♀ (MZ); Villavicencio 1 ♀, 1 ♀, (MCZ). *Putumayo*: Villa Garzon 1 ♂, 14 ♀ (BM), 1 ♂, 1 ♀, 1 ♀ (MZ). COSTA RICA: *Heredia*: Finca La Selva 2 ♀, 7 ♀ (MCZ), 2 ♀, 2 ♀ (MZ). ECUADOR: Paramos Mass, Volcan Cotopaxi, NNE Latacunga, 3350m, 1 ♀ (MCZ). *Napo*: Limoncocha 250m, 1 ♀ (MCZ). *Pichincha*: 47 Km S Santo Domingo, Rio Palenque, 3 ♀ (MCZ), 3 ♀ (MZ). MEXICO: *S. Luis Potosi*: El Salto 3 ♀ (MCZ), 1 ♀ (MZ). *Guerrero*: Acapulco 1 ♀ (MZ). *Veracruz*: Paraje Nuevo Nascimento, 1 ♀ (MCZ), 1 ♀, 1 ♀ (MCZ); 10 Km E Campeche 1 ♀ (MZ). PANAMA: *Canal Zone*: Isla de Barro Colorado 1 ♀ (MZ), 1 ♀ (MCZ), Serro Azul 2 ♀, 3 ♀ (MCZ), 2 ♀, 2 ♀ (MZ). PERU: Valle Chanchamayo (Quirimi), 800m, 1 ♀, 1 ♂, 16 ♀ (MZ), 1 ♀, 7 ♀ (FML), 4 ♀ (MCZ), 4 ♀ (BM). SURINAME: Dirkshoop 5 ♀ (MZ - types), 3 ♀ (MCZ - types). TRINIDAD: Saint George Coura 1 ♀ (MZ).

Megalomyrmex incisus

(Figs. 113, 114, 134)

Megalomyrmex, incisus M. R. Smith, 1947: 102-103, ♀. Type Loc.: Barro Colorado Island, CZ, Panama (09° 10'N, 79° 51'W).

Types

Holotype and 11 paratypes at National Museum of Natural History, Washington (n° 58040); 6 paratypes at Museum of Comparative Zoology, Harvard and 3 paratypes at Museu de Zoologia da USP.

Worker

Falcate mandibles smooth with dental formula 2 + (5-6); anterior clypeal border round without median denticle; median area of clypeus may be depressed but it is never marked by lateral carinae or anterior teeth; frontal suture in general impressed; 16 ocular facets at compound eye largest diameter; occipital margin not raised; promesonotal suture obsolete at thorax dorsum; metanotal groove deeply excavated and completely sculptured at dorsum; katapisternum may present gross longitudinal rugosities; dorsal face and declivity of propodeum indistinct; dorsal

face not depressed longitudinally; declivity may have 0-2 concentric rugosities over the foramen; propodeal spiracles laterally produced in an angle of 45° to the main axis of body; pedunculate petiole with petiolar node slope straight in side view; ventral face of petiole with anterior denticle originating a longitudinal translucent flange; postpetiole as broad as the petiole in dorsal view with ventral process globose.

Pilosity: two parallel rows of long hairs, (.2mm) from the frontal carinae to head vertex. Pronotum with 4 to 6 long hairs, which also appear at petiolar and postpetiolar node apexes and are uniformly distributed over the gaster. Small hairs (.1mm) at mandibles, cephalic vertex, legs and gaster apex.

Color: in general deep and bright reddish-brown, but head and gaster may be almost shiny black and legs may be orange-yellow.

Male

Mandibles with dental formula 1+3; clypeus without median denticles; first and second funicular joints much longer than other antennal segments; mesonotum with parapsidal sutures; propodeum spiracles as in the workers; declivity with concentric rugosities; epipetiolar carina complete; petiolar and postpetiolar nodes obsolete.

Comments

M.R. Smith described *M. incisus* upon 30 workers collected by James Zetek between July and October of 1943 (Zetek n° 5104, coll. n° 43-16543).

I did not take measures from the holotype because the Museu de Zoologia housed 3 paratypes and I did not bring the National Museum of Natural History types to São Paulo.

The specimens collected at Leticia, Magdalena, Colombia came from Berlesate samples and included dealated queens and workers, which suggested me that this species can live in diffuse colonies within the litter.

At the St. Patrick, Trinidad sample I found a gamergate and 5 workers. The reproductive is paler than ordinary workers, have 3 equally developed ocelli and petiolar and postpetiolar nodes broader than all conspecific workers or queens.

M. incisus shows intraspecific variation in size, dental formula, sculpture and color. The Diamantino, MT, Brasil specimens represent an extreme in all these characters with the higher values in all morphometric characters taken, declivity with rugosities and yellow legs.

In the Colombian samples the workers are bicolored with head and gaster darker than the body.

Dental formula varies among the series with the masticatory blade with 5 to 7 denticles. The katepisternum may be smooth or completely sculptured.

This variation pattern may be associated with the presence of gamergates taking over the reproductive function in some nest series.

M. incisus can be distinguished from *M. drifti* by the lack of anterior clypeal teeth and the falcate mandibles.

Material examined: BRASIL: *Mato Grosso*: Fazenda Junqueira Vilela, Diamantino, 5 ♀ (MCZ), 4 ♀ (MZ), 2 ♀ (BM). COLOMBIA: *Bolivar*: Leticia 1 ♀ (MCZ), *Magdalena*: San Juan de la Sierra (pico Yerbabuena) 1 ♀ (MCZ). *Meta*: Villavicencio 1 ♀ (MCZ), 2 ♀ (MZ), 1 ♀ (BM). ECUADOR: *Napo Pastaza*: 23Km N Puyo (1000m), 4 ♀ (MCZ). *Pichincha*: Tinlandia, 16 Km SE Santo Domingo de los Colorados, 2 ♀ (MCZ). MEXICO: *Veracruz*: Pueblo Novo, near Tetzonapa, 1 ♀ (MCZ). PANAMA: *Canal Zone*: Barro Colorado 13 ♀ (types - NMNH), 3 ♀ (MZ - types), 6 ♀ (MCZ - types), 2 ♀ (MZ), 2 ♀ (BM), 4 ♀ (MCZ). PERU: *Pasco*: Pozuzo (1000m) 12 ♀ (MCZ), 1 ♀ (BM), 6 ♀ (MZ). TRINIDAD: Basse Tierre 1 ♂, 2 ♀ (MZ), 1 ♀ (gamergate), 1 ♀ (BM); Caroni Swamp 1 ♀ (BM); Saint Patrick, Green Hill, 1 ♀ (gamergate), 2 ♀ (MZ), 3 ♀ (BM). VENEZUELA: *Aragua*: Racho Grande 1 ♂, 1 ♀, 8 ♀ (MCZ), 1 ♂, 1 ♀, 6 ♀ (MZ), 3 ♀ (BM).

Megalomyrmex gnomus

(Figs. 115, 116)

Megalomyrmex gnomus Kempf, 1970: 359-361, figs. 5-8, ♀. Type Loc.: Corumbá, Mato Grosso do Sul, Brasil (19° 01'S, 57° 39'W).

Types

Holotype and 2 paratypes at Museu de Zoologia da USP.

Worker

Smooth mandibles with dental formula 2+6; clypeus strongly truncate in lateral view with anterior border round without median denticle; palpal formula 3:1; 12 ocular facets at compound eyes largest diameter; frontal suture not impressed; occipital margin not raised; promesonotal suture obsolete at dorsum; metanotal groove deeply impressed and smooth; dorsal face and declivity of propodeum meeting in a gentle angle; epipetiolear carina complete; non-pedunculate petiole with node slope curve and ventral face with anterior denticle leading to a smooth longitudinal flange; transverse postpetiole with laterally produced spiracles and ventral process in a sharp tooth.

Pilosity: long erect or suberect hairs (exceeding maximum diameter of eyes) at body dorsum, smaller oblique hairs on scapes and legs.

Color: bright yellow with darker gaster.

Comments

This species is known only by the type series collected by C.R. Gonçalves. The paratypes bear a label indicating Cuyaba as the locality, while in the original description all types are said to come from Corumbá. The late Dr. Gonçalves confirmed that all types came from a nest series taken in Corumbá. I added a label to the paratypes saying: "Inform. do coletor. Localidade tipo: Corumbá, MS, Brasil, CRG, 18.x.1953. CRF, Brandão, 1984".

M. gnomus can be easily distinguished from all other species in the group by the sharp tooth under the postpetiole, combined with the smooth translucent longitudinal flange under the petiole.

There are no informations on the biology of this species.

***Megalomyrmex miri*, sp. n.**

(Figs. 117-118)

Megalomyrmex miri, sp.n., ♀. Type Loc.: Zent, Costa Rica (10° 02'N, 83° 16'W).

Types

Holotype at National Museum of Natural History, Washington; Paratype at Museu de Zoologia da USP.

Worker

Smooth mandibles with 2 apical teeth and 5-6 subapical denticles; anterior clypeal border round without median denticle; 5 ocular facets at compound eyes largest diameter; frontal suture not impressed; occipital margin not raised; promesonotum profile continuous; metanotal groove deeply excavated and completely sculptured; dorsal face and declivity of propodeum meeting in marked and divergent angles; declivity with faint concentric rugosities; epipetiolear carina complete; petiolear node compressed anteroposteriorly; ventral face of petiole with blunt anterior denticle originating a transversally sculptured flange; ventral face of postpetiole with a small acute tooth.

Pilosity: short appressed hairs at scape (less than .1mm); frontal carina, head vertex, and sides of pronotum with hairs of circa .1mm; pronotum dorsum and apex of petiolear and postpetiolear nodes and gaster with longer hairs (between .15 and .2mm).

Color: bright light yellow with translucent gaster.

Comments

M. miri, sp.n., is the smallest species for the whole genus. It can be distinguished by the transversally sculptured flange ventral to the petiole. The small size suggested the Tupi name *miri*.

The type specimens bear a label saying "W. M. Mann collection 1954" and have been collected in March, 1924.

Megalomyrmex myops

(Figs. 119-121)

Megalomyrmex myops Santschi, 1925: 237-238.

♀. Type Loc.: Rio Negro, Paraná, Brasil. (26° 06'S, 49° 48'W).

Lectotype designation

Lectotype at Naturhistorisches Museum, Basel; 1 paralectotype (not examined) at the same collection.

Worker

Smooth mandibles with dental formula 3+ (3-5); median area of clypeus with longitudinal rugosities and anterior border round with median denticle; 6-7 ocular facets at compound eyes largest diameter; frontal suture not impressed; occipital margin not raised; promesonotal suture not impressed dorsally; dorsal face and declivity of propodeum meeting in gentle angles, declivity with faint lateral carina but no concentric rugosities; epipetiolar carina incomplete dorsally; ventral face of petiole with longitudinal flange including the anterior denticle; postpetiolar node globose; ventral face of postpetiole without process.

Pilosity: long erect hairs (ca. .15mm) at body dorsum, smaller subdecumbent hairs at antennae, mandibles, legs and ventral face of gaster.

Color: bright deep-yellow with darker gaster in some specimens.

Comments

The 4 workers of the series have been collected by M.A. Reichensperger. I examined one specimen labelled as "typus" (designated hereby as lectotype) and was informed by Dr. Baroni Urbani that the Basel Museum has another worker from the same series. The remaining specimens may have been exchanged by Santschi with other scientists.

At the original description Santschi (1925) stated that the propodeal declivity bears fine longitudinal stria. This may refer to the faint lateral carinae, as the center of the declivity is totally smooth. Santschi noticed (1936) the variation in number of denticles at the mandibles blades in non-type specimens. Apart this observation and the presence of small faint denticles at the clypeus anterior border in specimens from S. Paulo localities (Fig. 121), all specimens are identical in terms of the diagnosis stated above.

Material examined; BRASIL: *Paraná*: Laranjeiras 1 ♀ (MZ); Rio Negro 1 ♀ (NMB - type). *Rio Grande do Sul*: Tainhas 1 ♀ (MZ). *Santa Catarina*: Nova Teutônia 13 ♀ (MZ), 2 ♀ (NMB), 1 ♀ (MGD), 2 ♀ (MCZ), 1 ♀ (NMNH). *São Paulo*: Estação Biológica da Boracéia 2 ♀ (MCZ), 1 ♀ (NMNH); Salesópolis (mt. forest) 1 ♀ (MZ); Serra da Cantareira 1 ♀

(MZ); Velha Estrada Santos - São Paulo (Meio da Serra) 1 ♀ (MZ).

Megalomyrmex pusillus

(Figs. 122-124, 132)

Megalomyrmex pusillus Forel, 1912: 15, ♀.
Type Loc.: Alto da Serra, SP, Brasil (23° 47'S, 46° 19'W).

Lectotype designation

Lectotype and 1 paralectotype at the Museum de la Ville de Genève; 1 paralectotype at Naturhistorisches Museum, Basel.

Worker

Smooth mandibles with dental formula (1-2) + 4; anterior border of clypeus in general round with median denticle; frontal suture not impressed; occipital margin not raised; promesonotal suture when present faintly impressed at dorsum; dorsal face and declivity of propodeum meeting in lateral acute tubercles divergent at apex and laterally compressed; declivity smooth; epipetiolar carina not complete dorsally; ventral face of postpetiole with anterior denticle; postpetiole ventral face without process.

Pilosity: long erect or suberect hairs (exceeding compound eyes diameter) at body dorsum and smaller subdecumbent hairs at clypeus, antennae and legs.

Color: bright light yellow.

Queen

Differs from conspecific workers in the following characters: triangular head in frontal view with areas of striation at the antennal sockets and distal portion of lateral area of clypeus. Ocelli equally developed. Median propodeal depression deeper than in workers. Postpetiolar node distinctly broader than petiolar node.

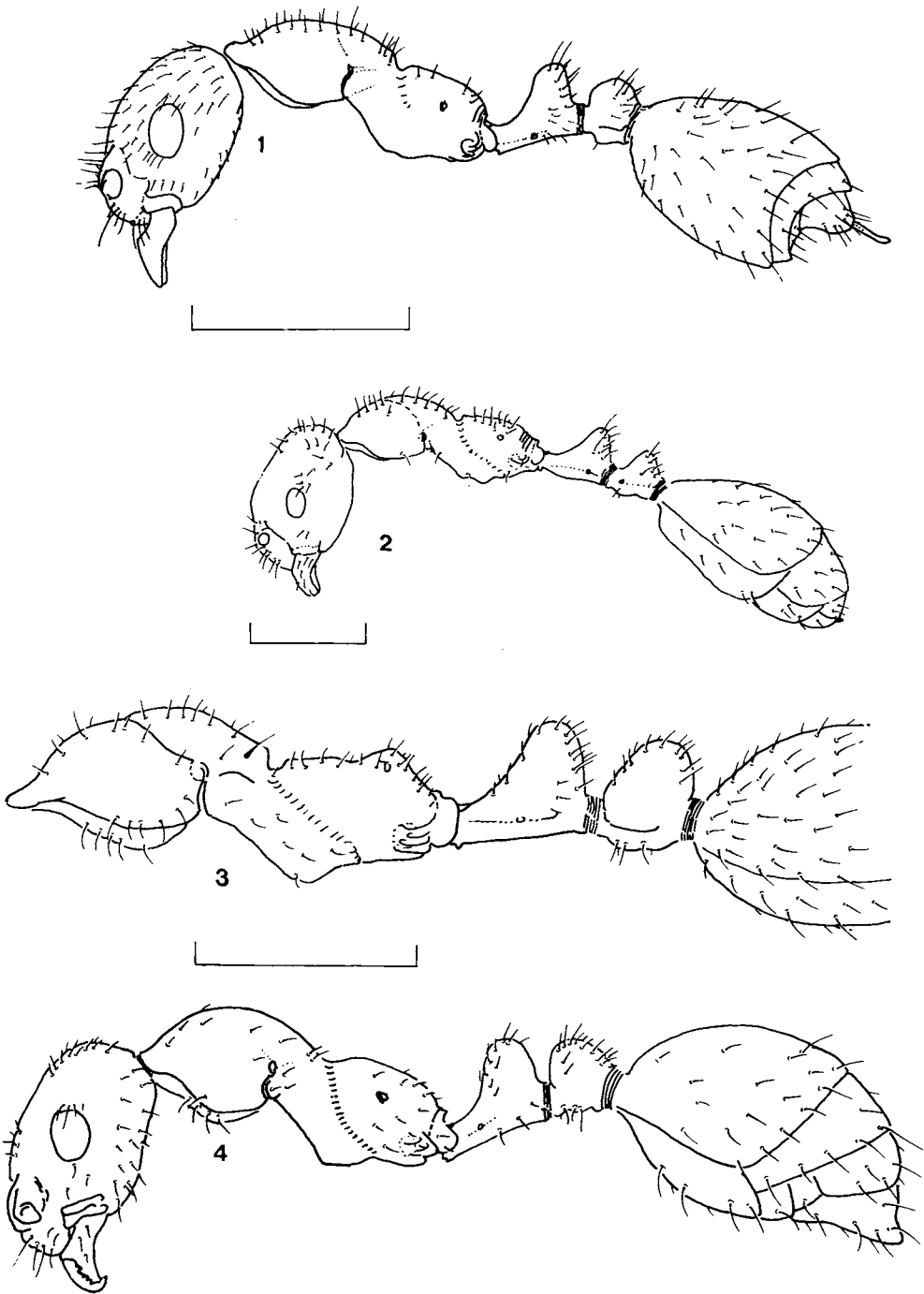
Comments

Forel (1912) observed a wide deep brown transversal band at the first gaster segment, contrasting with the light-yellow body. This condition is not constant for most samples, but it is present in the three available dealated females.

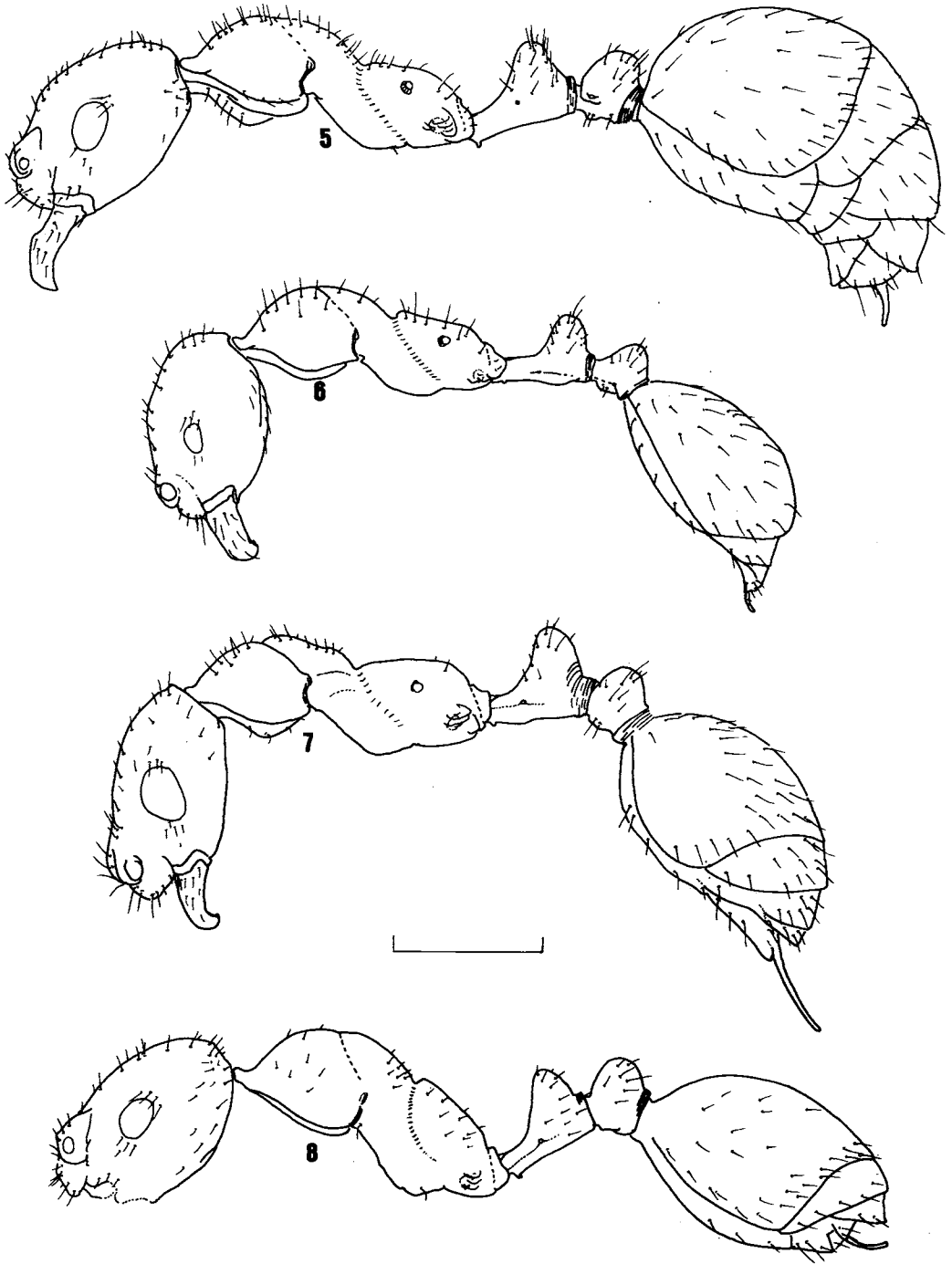
I noticed intraspecific variation among workers in terms of color, presence of median seta at the clypeal set (Fig. 124), degree of development of the anteromedian clypeal denticle and propodeum shape.

The sample from Alto da Serra, SP, Brasil (types and non-types) have extreme values for all measured characters, as already noticed by Borgmeier (1939).

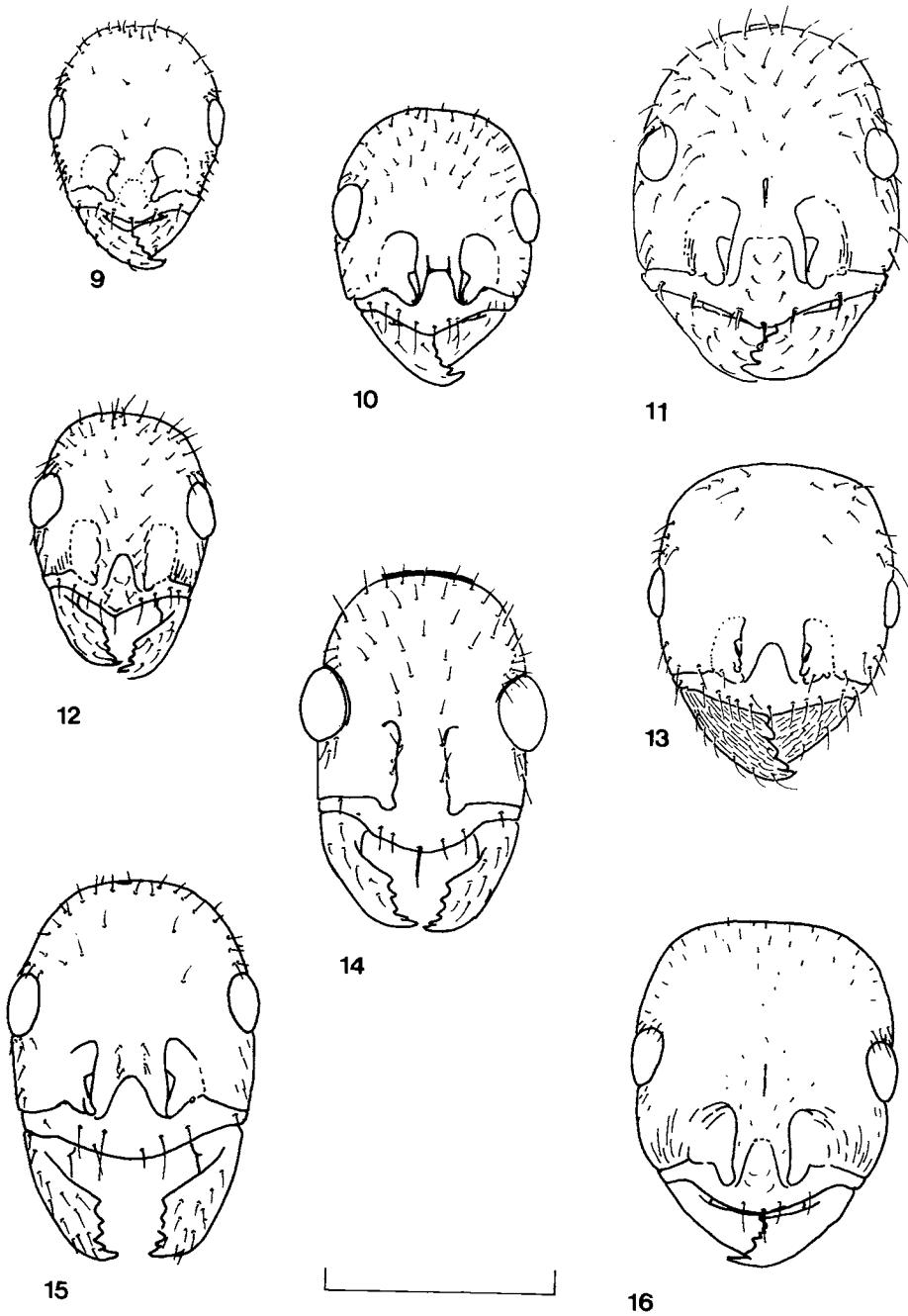
Material examined: BRASIL: *Paraná*: Bocaiuva do Sul 4 ♀ (MZ). *Rio de Janeiro*: Floresta da Tijuca 1 ♀ (MZ); Petrópolis, Morro do Serra-no, 6 ♀ (MZ), 4 ♀ (JLD). *Santa Catarina*: Ibi-caré 1 ♀ (MZ); Nova Teutônia 2 ♀ (MZ); Seara 1 ♀ (MZ); Serra Geral 1 ♀, 9 ♀ (MZ). *São Paulo*: Alto da Serra 5 ♀ (MVG - 2 types), 4 ♀ (MZ); Boracéia, Salesópolis, 1 ♀, 4 ♀ (MZ); Serra dos Agudos 1 ♀, 11 ♀ (MZ), 1 ♀ (NMB), 1 ♀ (MCZ), 1 ♀ (BM).



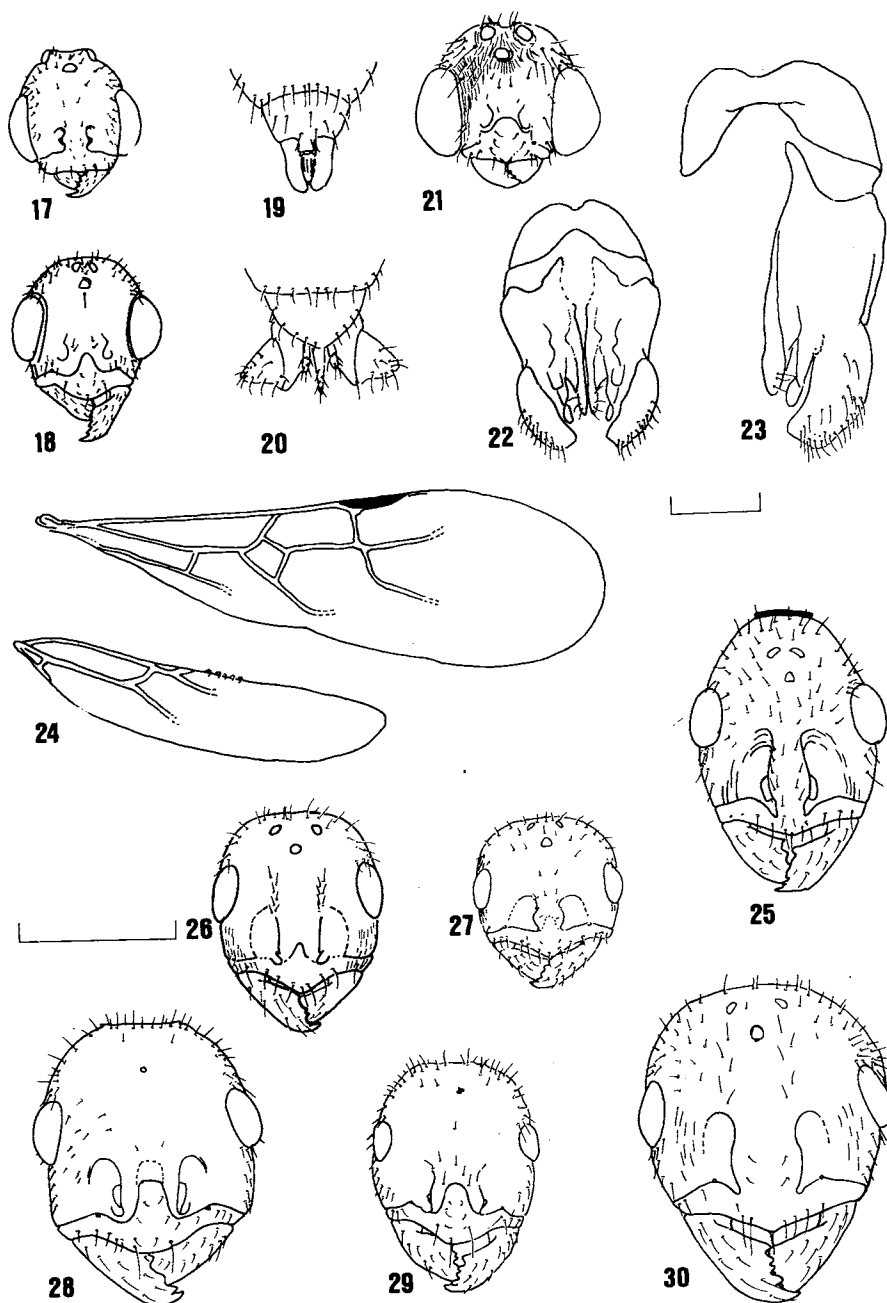
Figs. 1-4. Worker profiles: 1. *M. ayri*, sp.n. (holotype). 2. *M. caete*, sp. n. (holotype). 3. *M. cupecuara*, sp.n. (holotype). 4. *M. goeldii* (lectotype). Scale bars = 1mm.



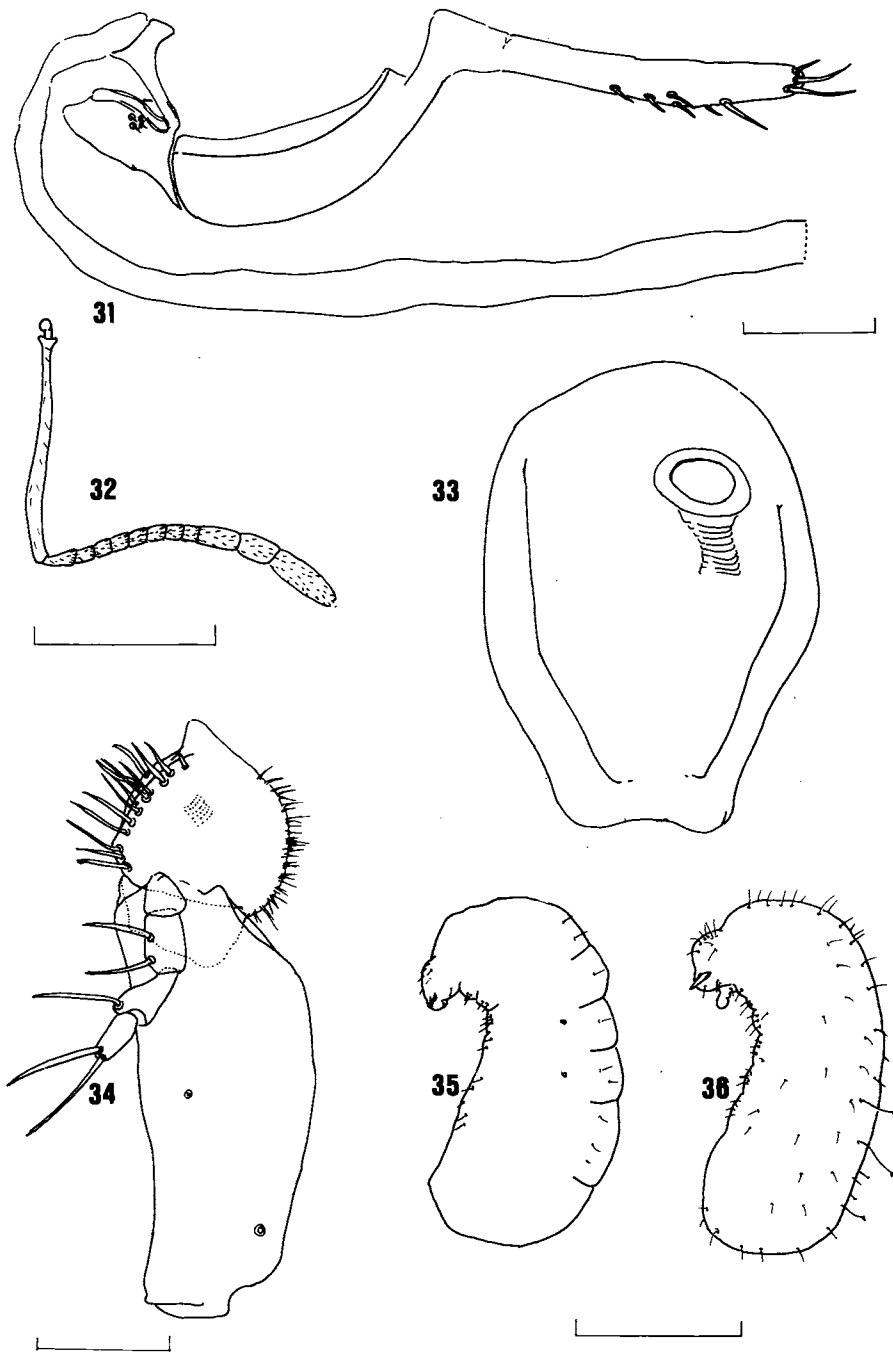
Figs. 5-8. Worker profiles: 5. *M. iheringi* (lectotype). 6. *M. modeustus* (lectotype). 7. *M. wallacei* (paralectotype). 8. *M. weyrauchi* (paratype). Scale bar = 1mm.



Figs. 9-16. Worker heads, frontal view: 9. *M. caete*, sp. n. (holotype). 10. *M. goeldii* (lectotype). 11. *M. cupecuara*, sp. n. (holotype). 12. *M. ayri*, sp. n. (holotype). 13. *M. modestus* (lectotype). 14. *M. wallacei* (paralectotype). 15. *M. iheringi* (lectotype). 16. *M. weyrauchi* (holotype). Scale bar = 1 mm.



Figs. 17-30. Male heads, frontal view: 17. *M. modestus* (R. Torito, Chocó, Colombia). 18. *M. goeldii* (Nogueira, RJ, Brasil). 21. *M. cupecuara*, sp. n. (paratype). ♂ genitalia: 19. *M. modestus* (same as 17: *in situ*). 20. *M. pr. wallacei* (Benjamim Constant, AM, Brasil - *in situ*). 22-23. *M. cupecuara*, sp. n. (paratypes). Wings of ♂: 24. *M. goeldii* (same as 18). Queen heads, frontal view: 25. *M. wallacei* (lectotype). 26. *M. ayri*, sp. n. (paratype, Utariti). 27. *M. caete*, sp. n. (paratype). 28. *M. iheringi* ("cotypus"). 29. *M. goeldii* (same as 18 and 24). 30. *M. modestus* (same as 17). Scale bar = .1mm (Figs. 17-23); 1mm (Figs. 24-30)



Figs. 31-36. Venom apparatus: *M. goeldii* (Petrópolis, RJ, Brasil): 31. side view. 32. spiracular plate. Antenna: 33. worker of *M. goeldii* (same as above). Left maxilla: 34. worker of *M. goeldii* (same as above). Larvae, side view: 35. *M. iheringi* (Meio da Serra, SP, Brasil). 36. *M. ayri*, sp. n. Scale bars = .1mm (Figs 31,33 and 34); 1mm (Figs. 32,35,36).

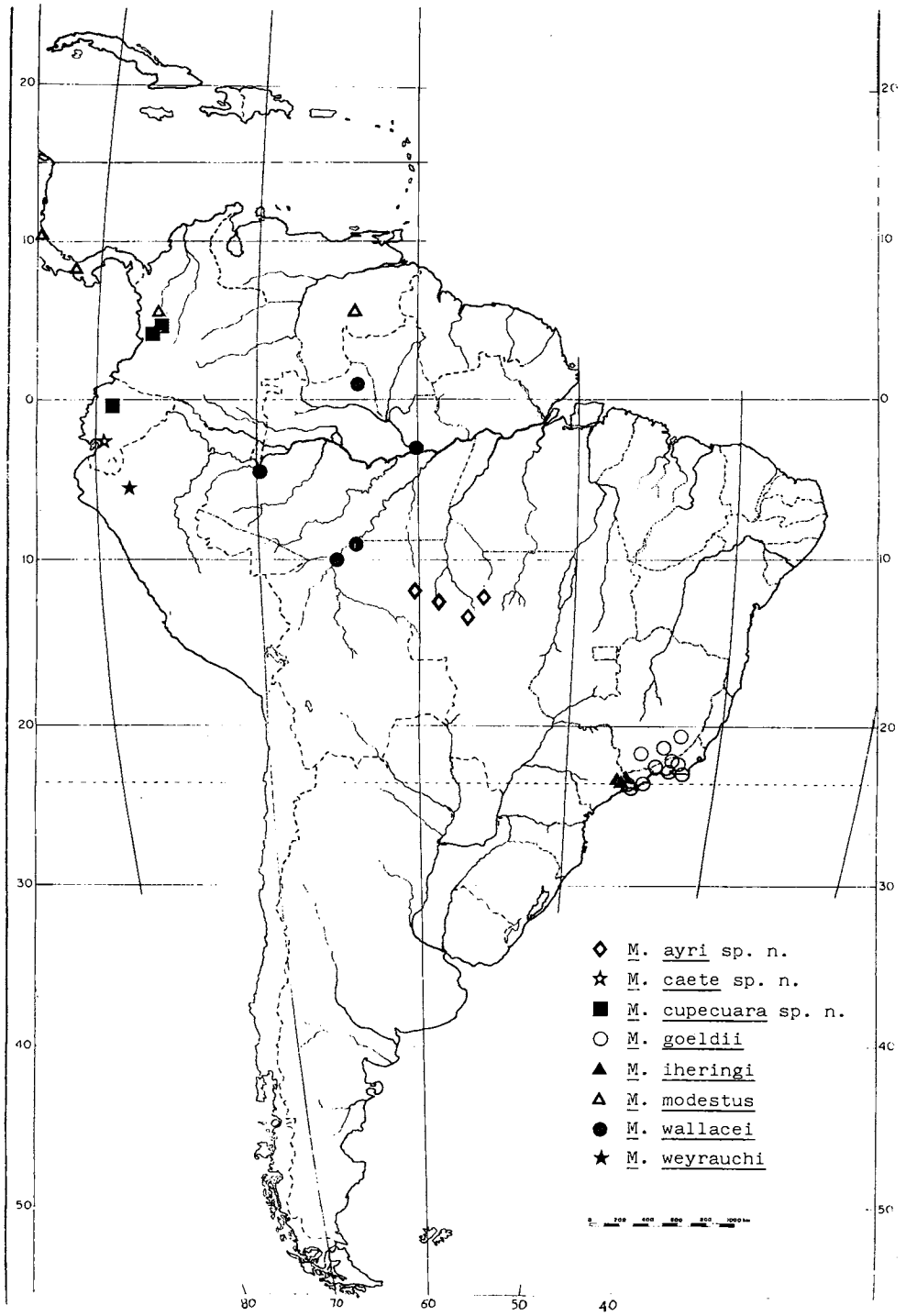
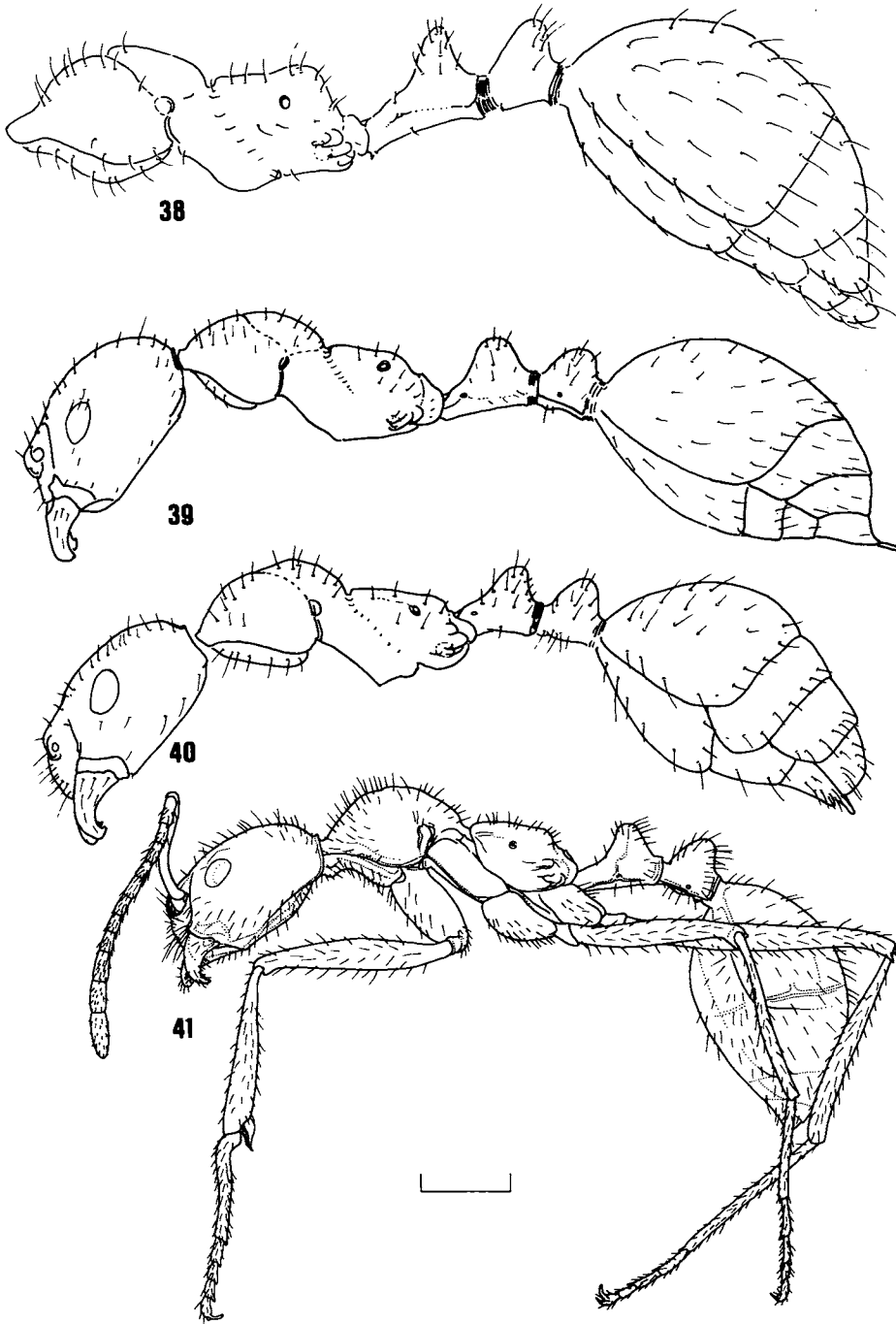
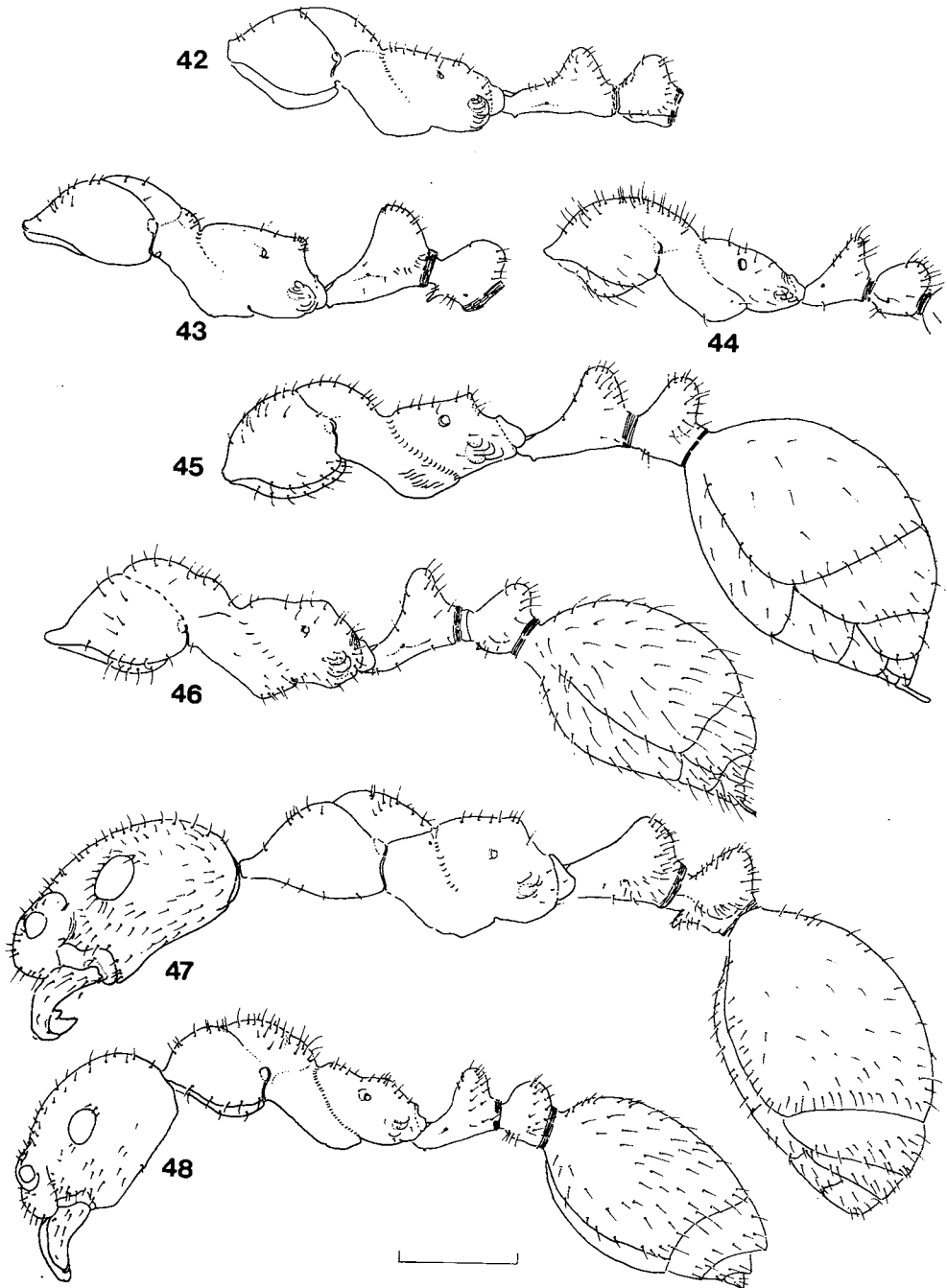


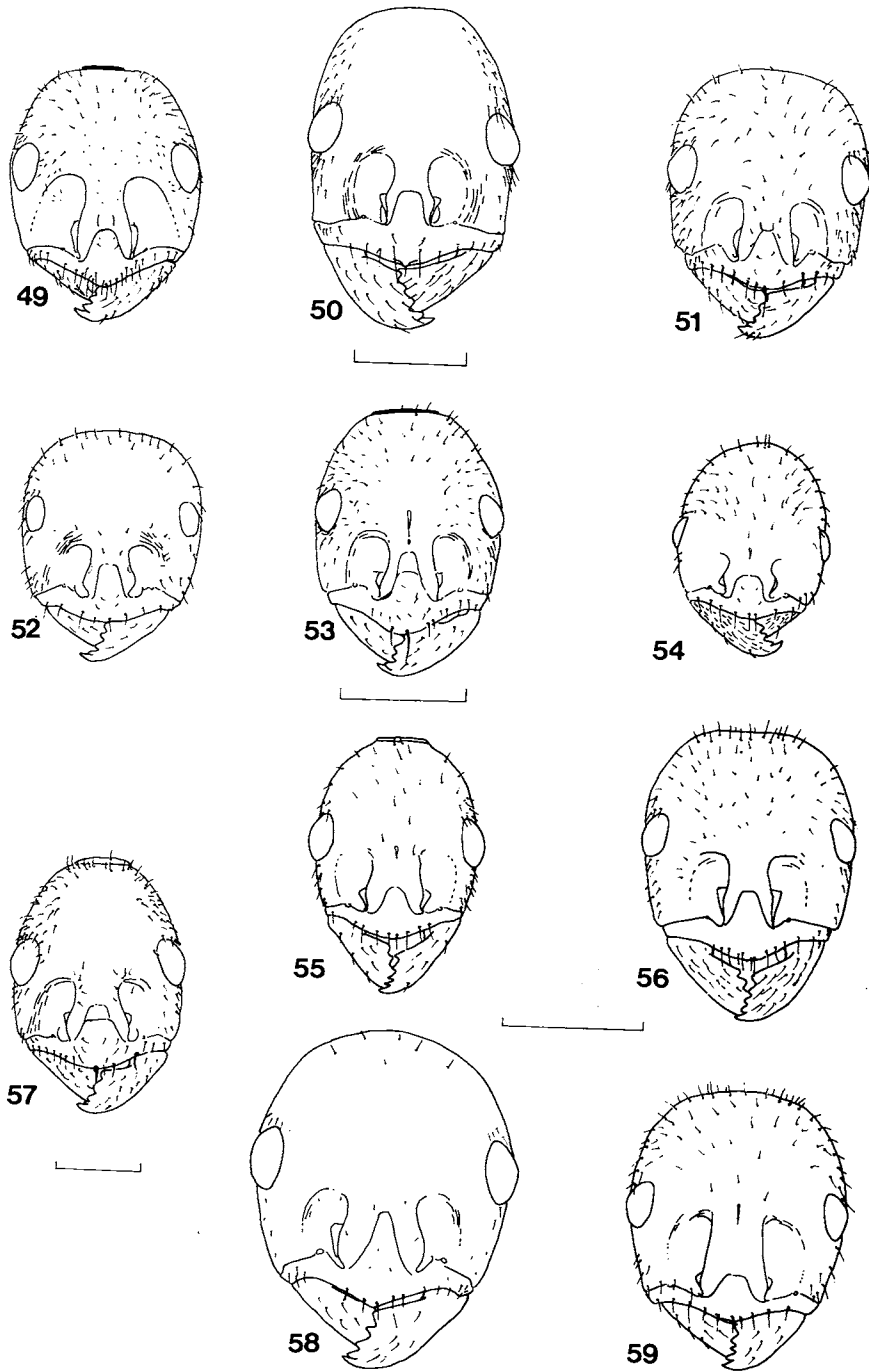
Fig. 37. Map of distribution, *Modestus* group.



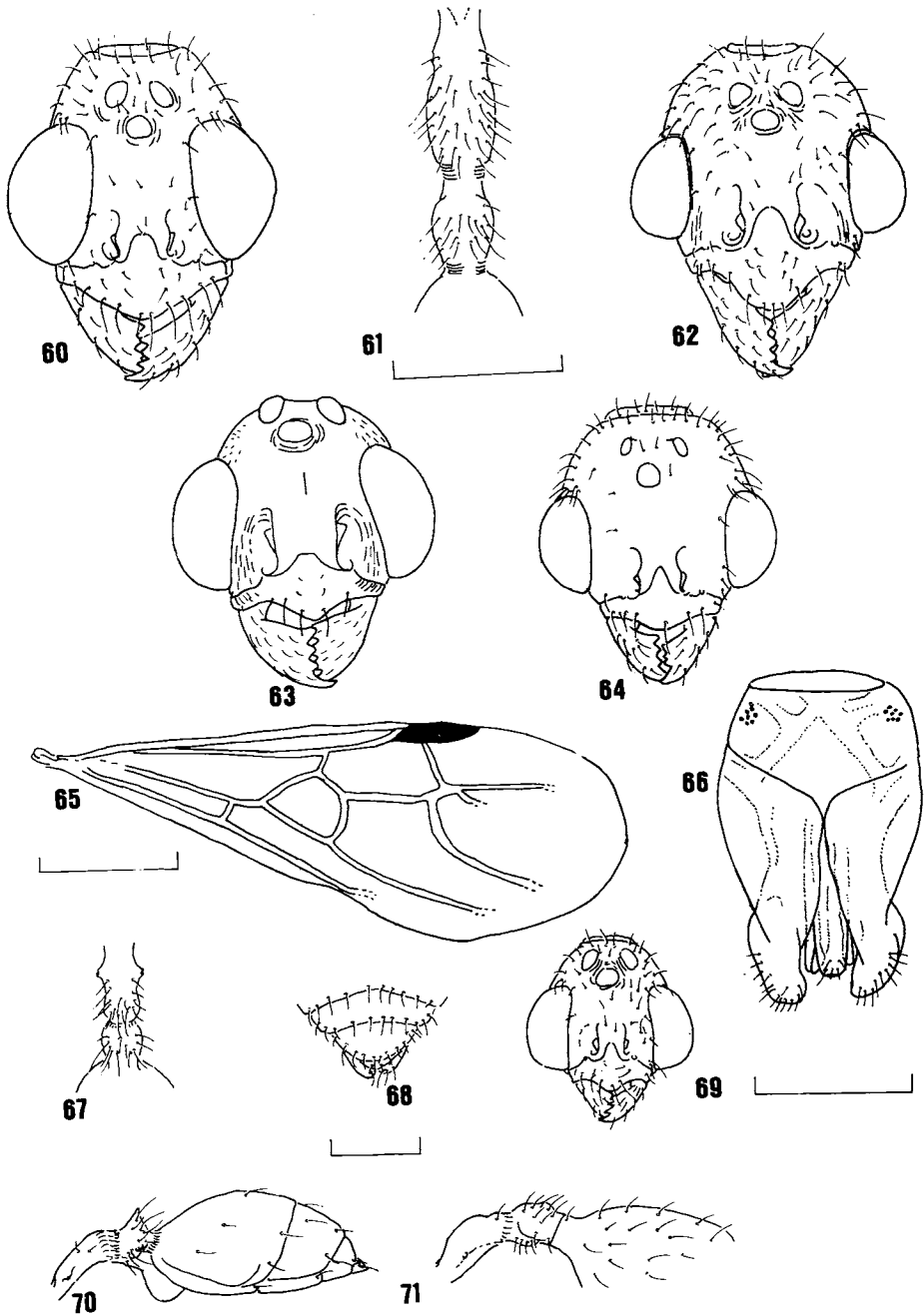
Figs. 38-41. Worker profiles: 38. *M. emeryi* (holotype). 39. *M. acauna*, sp. n. (holotype). 40. *M. balzani* (lectotype). 41. *M. leoninus* (Pq. Nac. Guatopo, Miranda, Venezuela). Scale bar = 1mm.



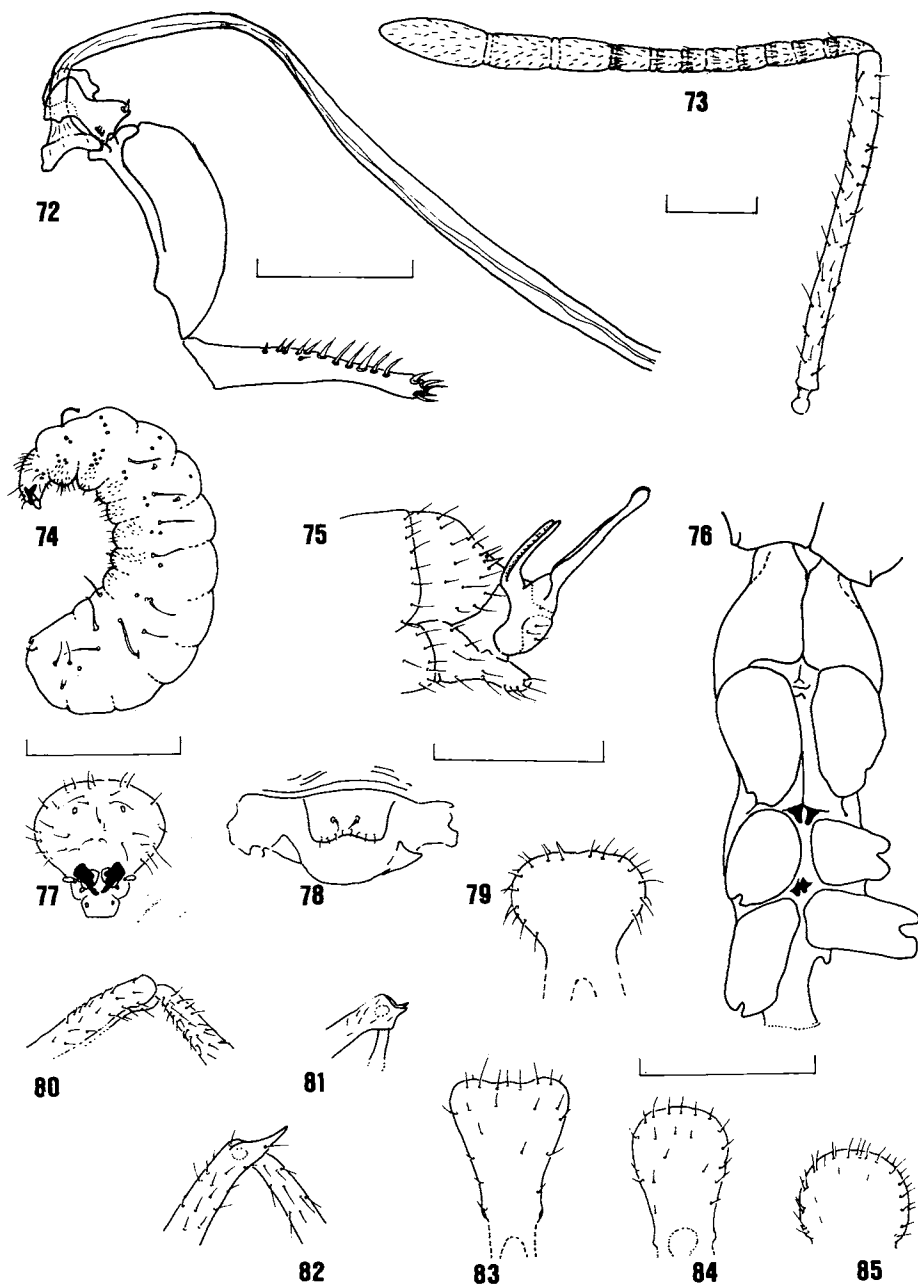
Figs. 42-48. Worker profiles: 42. *M. staudingeri* (holotype). 43. *M. foreli* (lectotype). 44. *M. cyendyra*, sp. n. (holotype). 45. *M. timbira*, sp. n. (holotype). 46. *M. pacova*, sp. n. (holotype). 47. *M. latreillei* (holotype). 48. *M. glaesarius* (holotype). Scale bar = 1mm.



Figs. 49-59. Worker heads, frontal view: 49. *M. foreli* (lectotype). 50. *M. emeryi* (holotype). 51. *M. leoninus* (lectotype). 52. *M. glaesarius* (holotype). 53. *M. latreillei* (holotype). 54. *M. cyendyra*, sp. n. (holotype). 55. *M. pacova*, sp. n. (holotype). 56. *M. acauna*, sp. n. (holotype). 57. *M. staudingeri* (holotype). 58. *M. batzani* (lectotype). 59. *M. timbira*, sp. n. (holotype). Scale bar = 1mm.



Figs. 60-71. Male heads, frontal view: 60. *M. foreli* (V. de Chiriqui, C. Rica). 62. *M. leoninus* (Cucuta, Merida, Venezuela). 63. *M. balzani* (Tumupasa, Beni, Bolivia). 64. *M. pr. emeryi*. 69. *M. pr. glaesarius*. Male pedicel, frontal view: 61. *M. leoninus* (same as 62). 67. *M. pr. emeryi*; side view: 70. *M. pr. emeryi*. 71. *M. pr. glaesarius*. Male front wing: 65. *M. pr. emeryi*. Male genitalia: 66. *M. balzani* (Benjamin Constant, AM, Brasil). 68. *M. foreli* (same as 60 - *in situ*). Scale bars = 1mm, except for Fig. 66 = .1mm.



Figs. 72-85. Venom apparatus *M. balzani*: 72. ordinary worker (Cavinas, Beni, Bolivia). 75. gamergate (same as 72, *in situ*). Antenna: 73. *M. staudingeri* (holotype). Larva *M. balzani* (Manaus, AM, Brasil): 74. profile, 77. head, frontal view. Worker frontal view: 76. *M. balzani* (Huachi, Beni, Bolivia). Labrum: 78. *M. latreillei* (Villavicencio, Meta, Colombia). Genual plates: 80. *M. foreli* (lectotype). 81. *M. staudingeri* (holotype). 82. *M. emeryi* (holotype). Petiole scale, frontal view: 79. *M. emeryi* (holotype). 83. *M. balzani* (same as 76). 84. *M. balzani* (Tumupasa, Beni, Bolivia). Postpetiole, frontal view: 85. *M. balzani* (lectotype). Scale bars = 1mm, except Fig. 72 = .1mm.

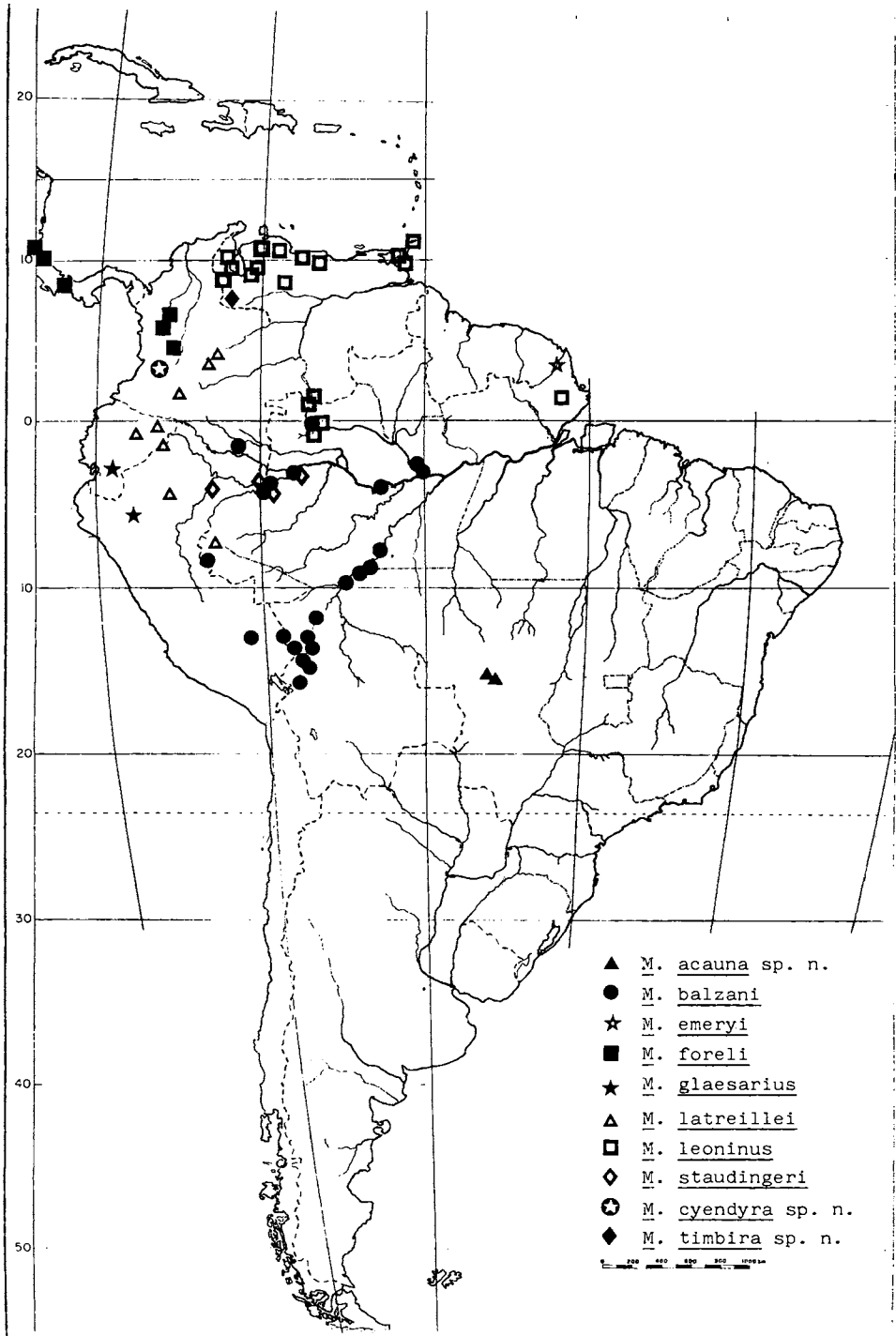
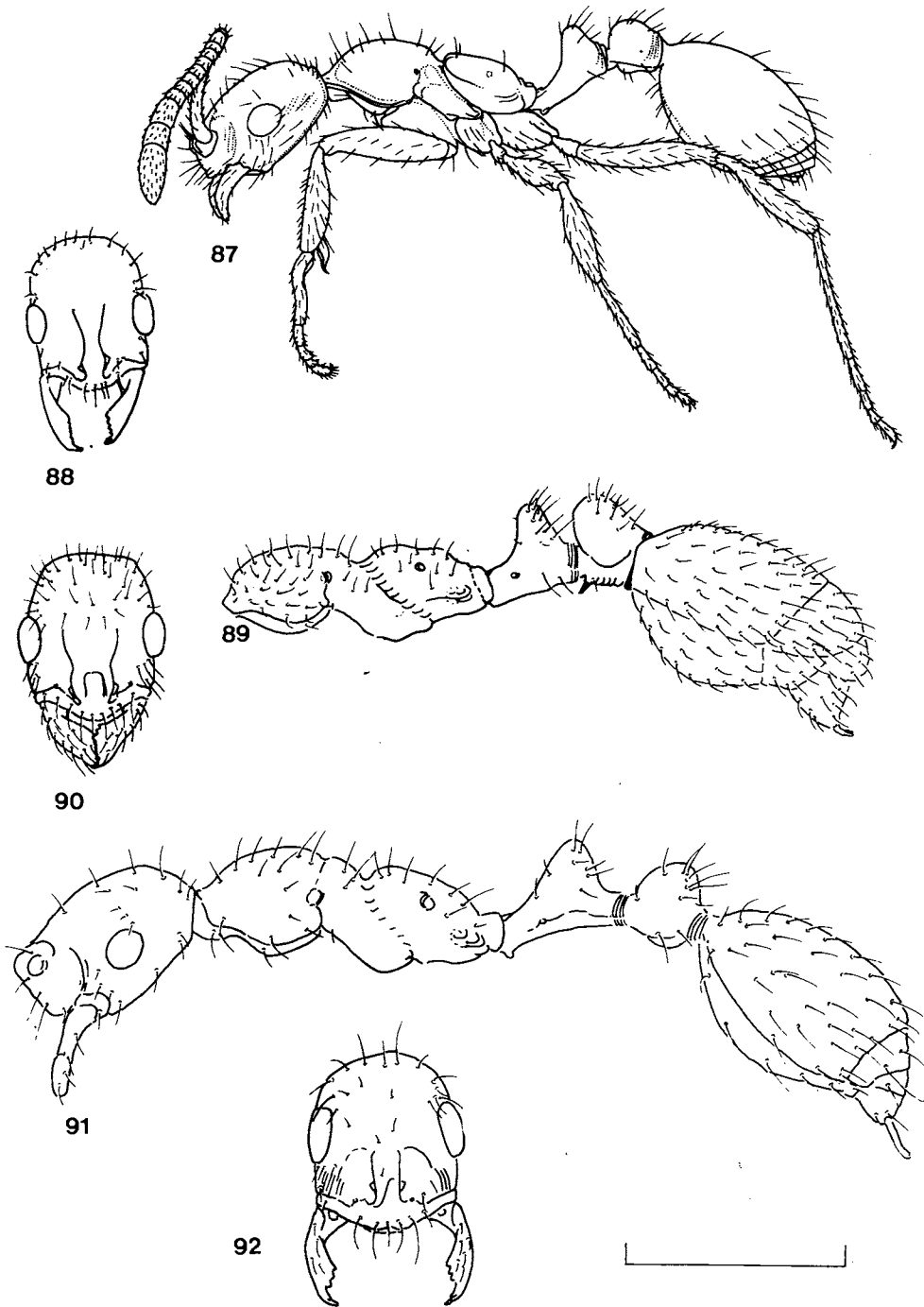
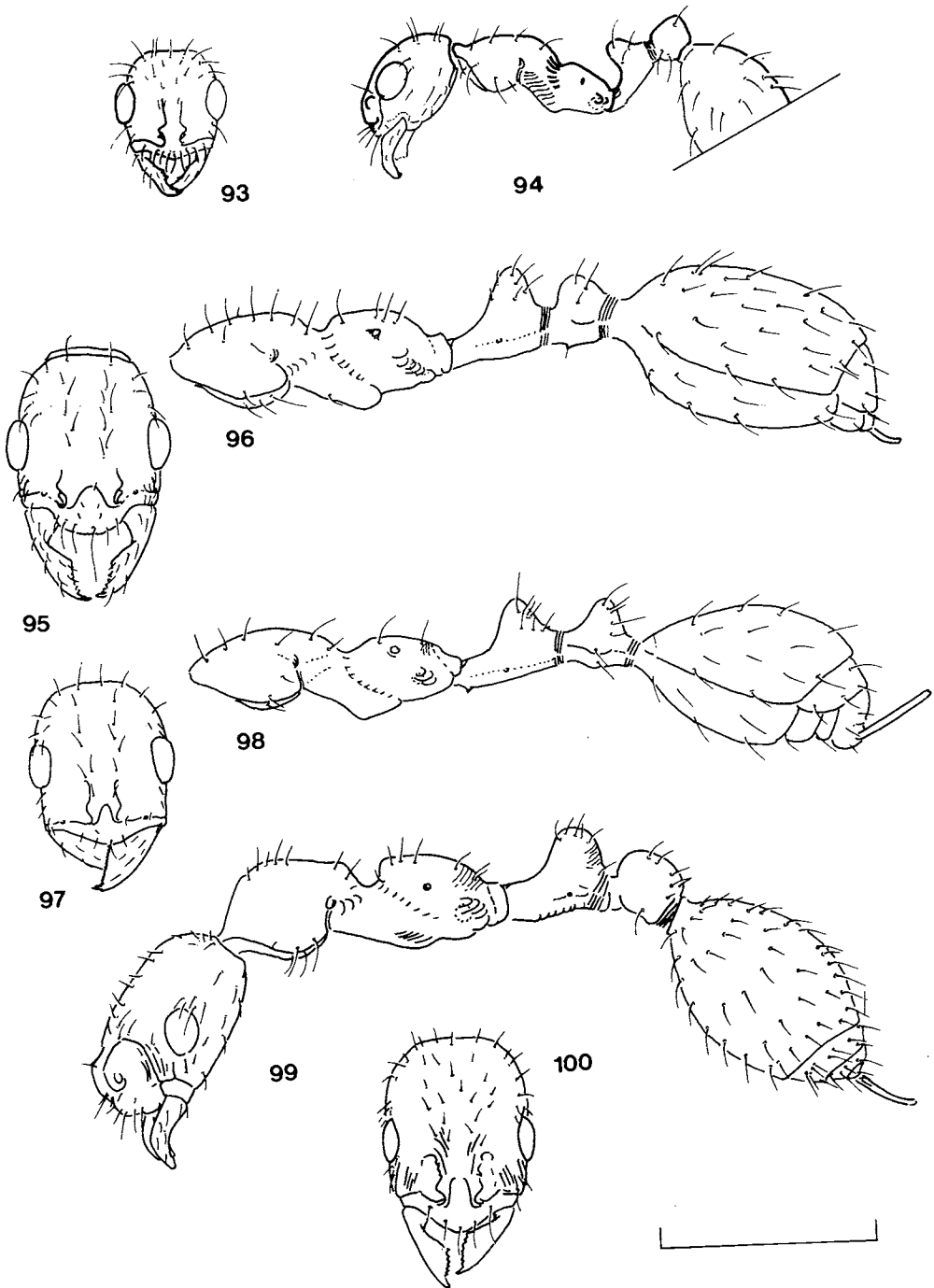


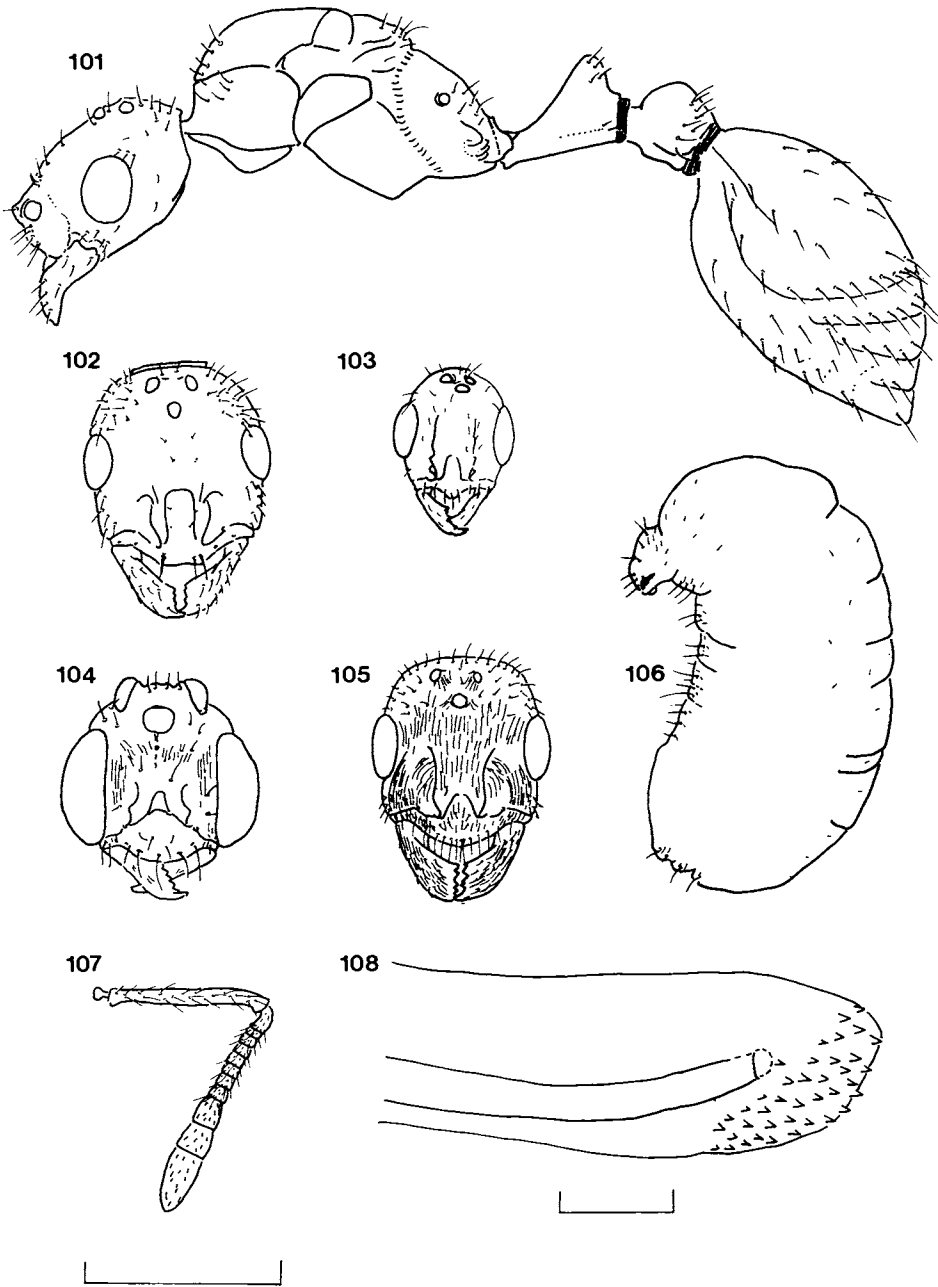
Fig. 86. Map of distribution, Leoninus group.



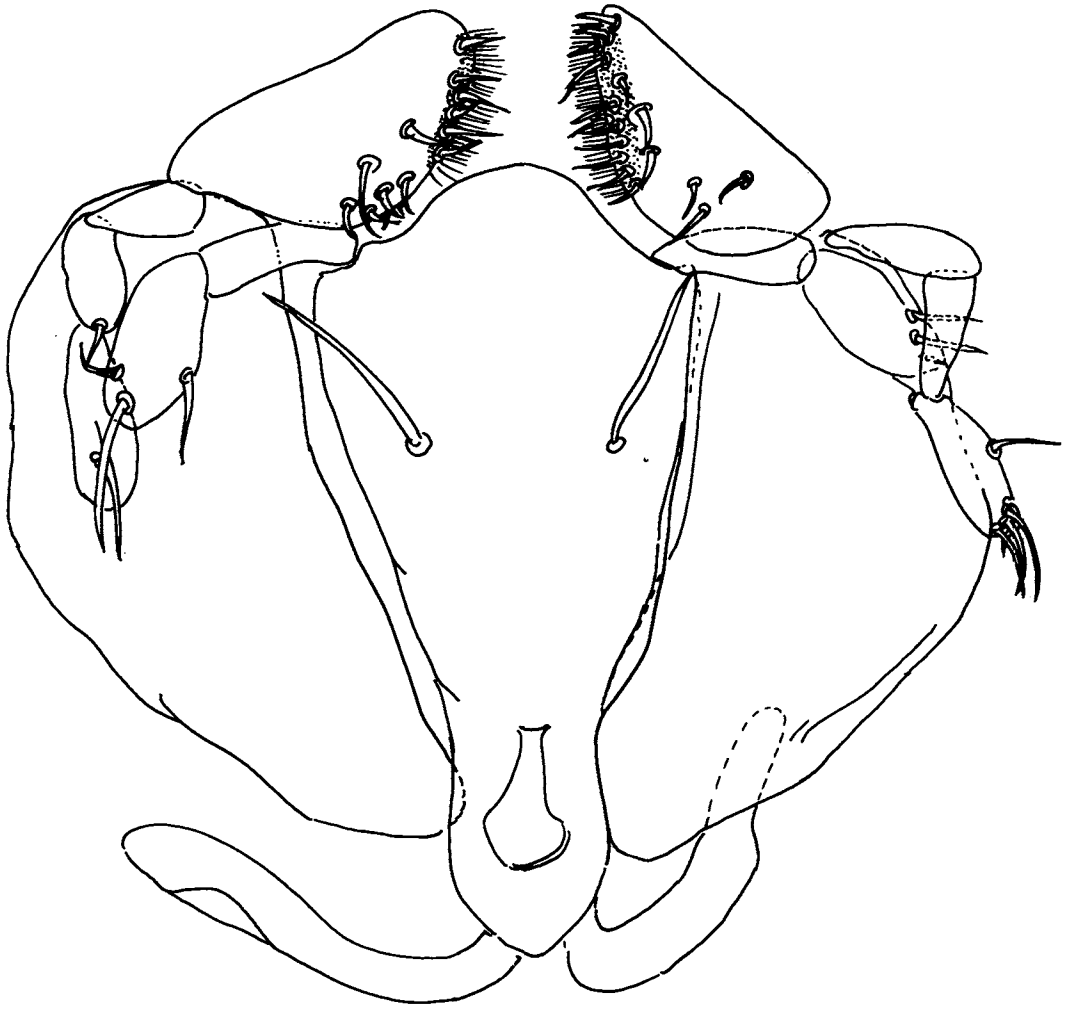
Figs. 87-92. Worker (profile; head, frontal view): 87-88. *M. silvestrii* (Manaus, AM, Brasil), 89-90. *M. symmetochus* (lectotype), 91-92. *M. tasyba*, sp. n. (holotype). Scale bar = 1mm.



Figs. 93 - 100. Worker (head, frontal view; profile): 93-94. *M. cuatiara*, sp. n. (holotype). 95-96. *M. mondabora*, sp. n. (holotype), 97-98. *M. piriana*, sp. n. (holotype), 99-100. *M. poatan*, sp. n. (holotype) Scale bar = 1mm.



Figs. 101-108. Queen profile: 101. *M. silvestrii* (dealated - Barro Colorado, CZ, Panama). Queen (head, frontal view): 102. *M. silvestrii* (same as 101). 103. *M. cuatiara*, sp. n. (paratype). 105. *M. symmetochus* (same as 101). Male (head, frontal view): 104. *M. symmetochus* (same as 101). Larva (profile): 106. *M. silvestrii* (Mirassol, SP, Brasil). Antenna: 107. *M. symmetochus* (paralectotype). Apex of venom apparatus: 108. *M. silvestrii* (same as 101). Scale bar = .1mm (Fig. 108); =1mm (Figs. 101-107).



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Fig. 109. Mouth apparatus, worker, *M. silvestrii* (Barro Colorado, CZ, Panama). Scale bar = .1mm.

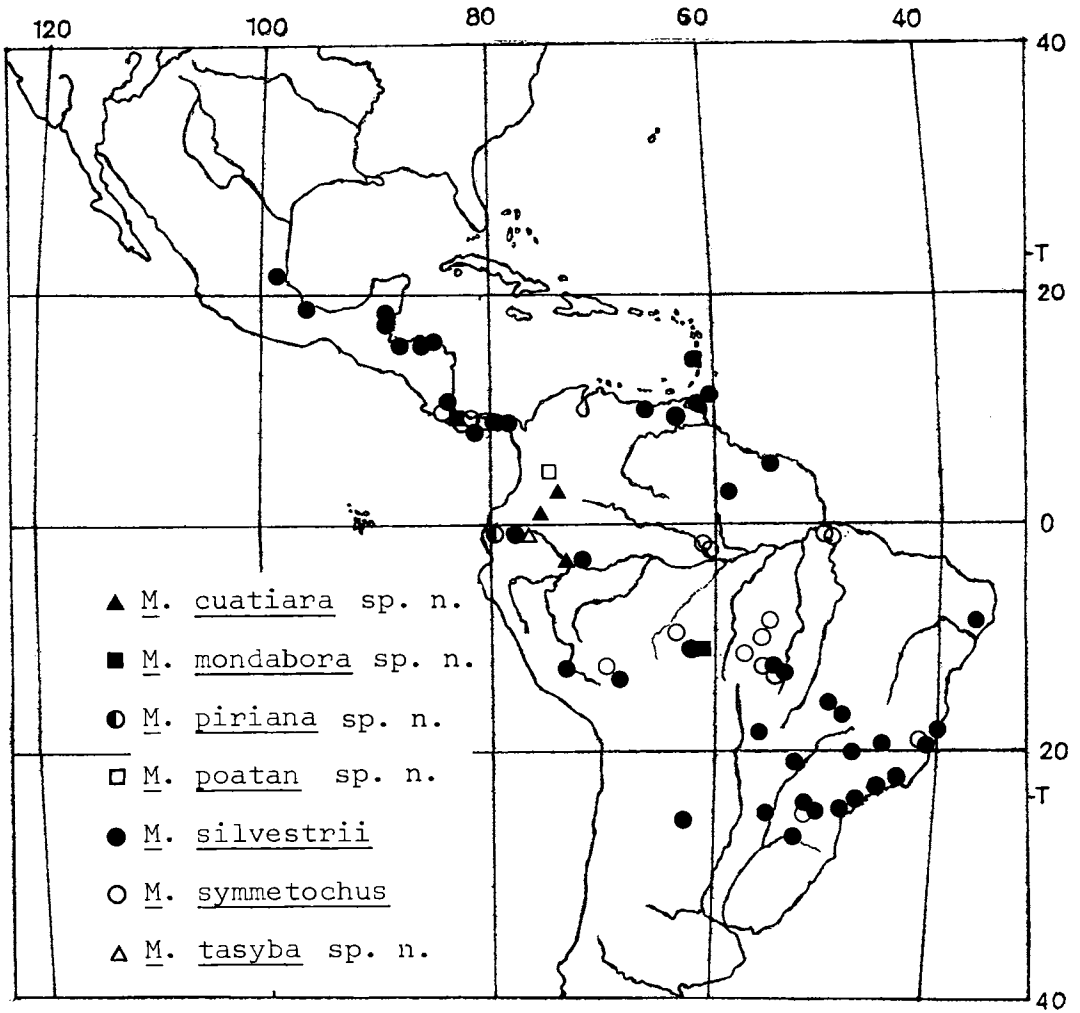
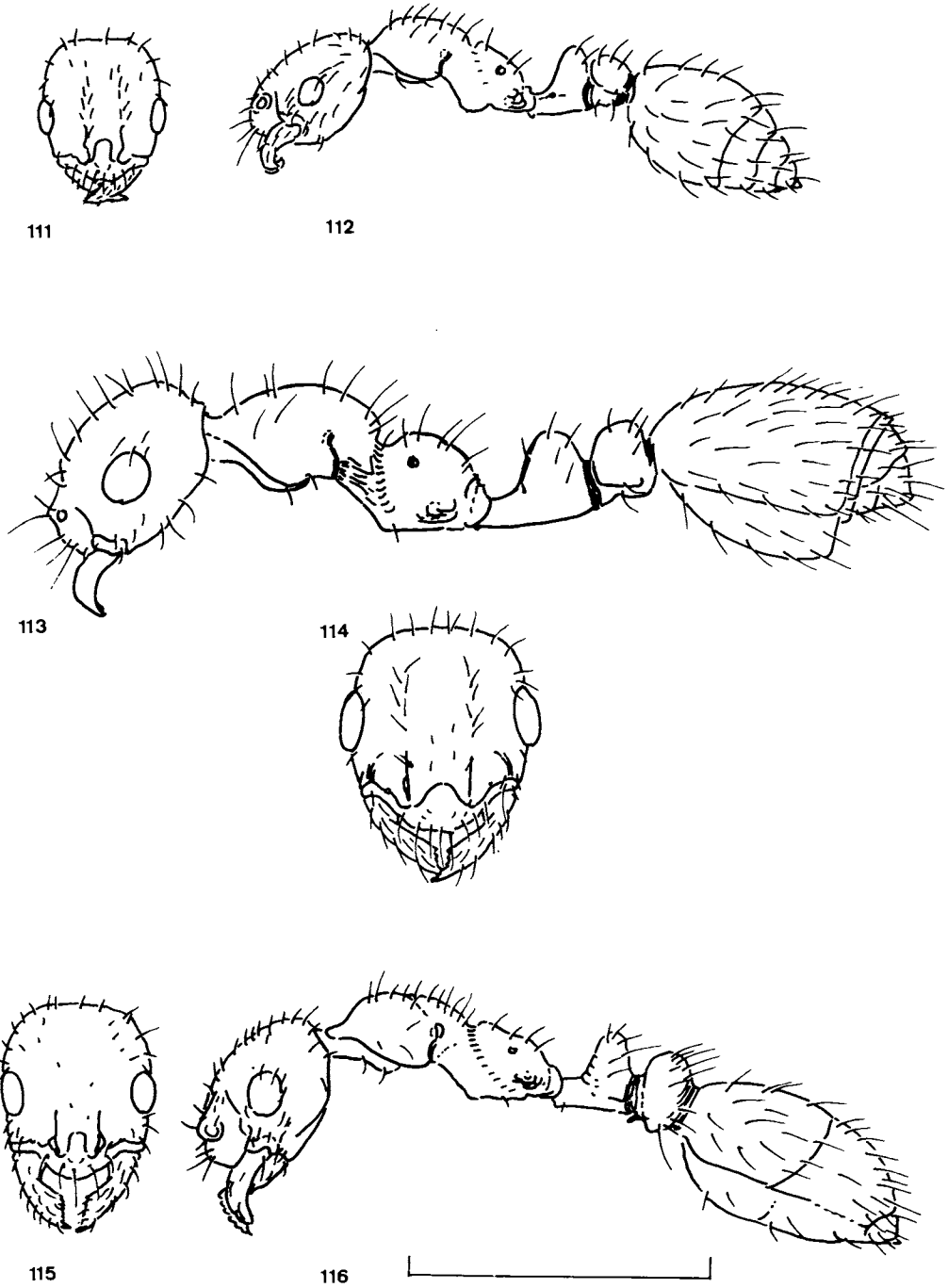
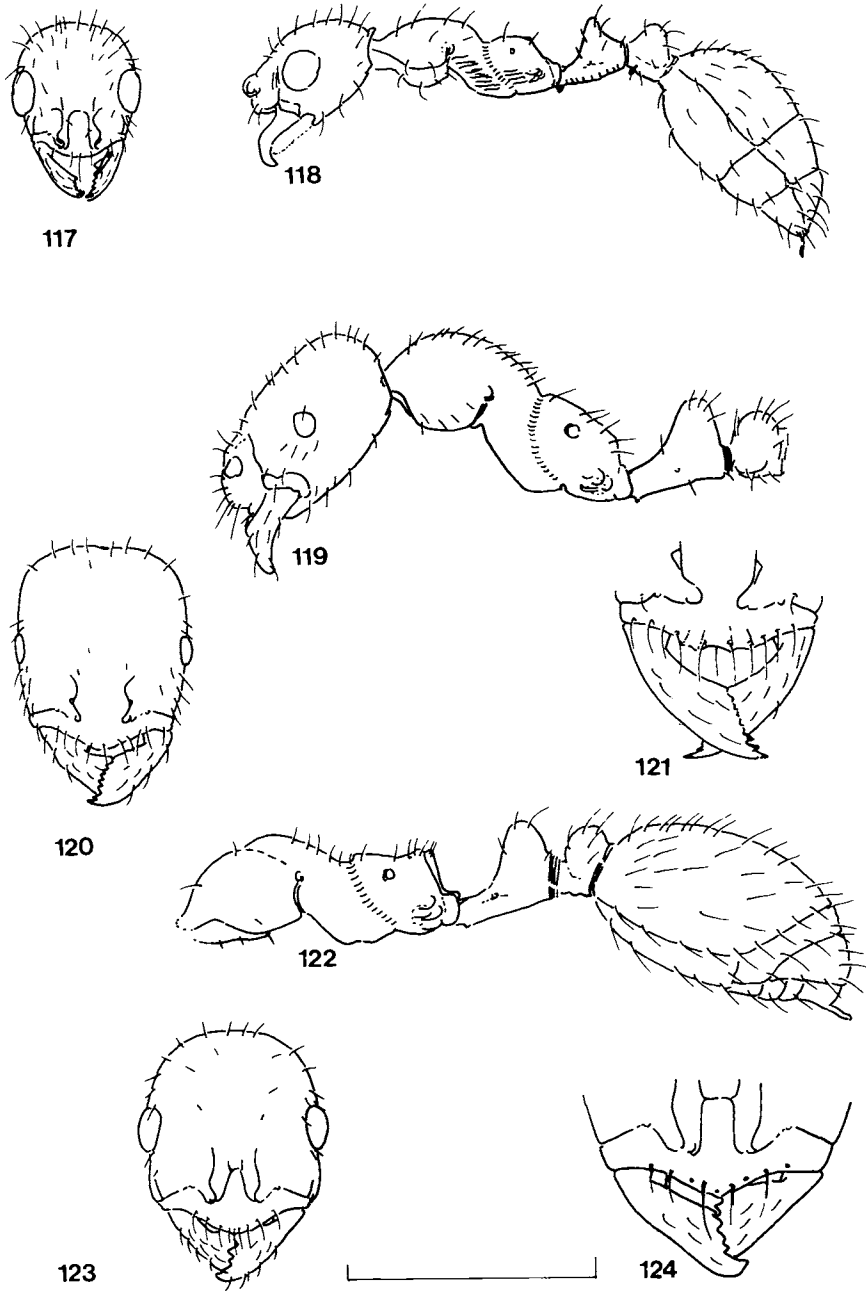


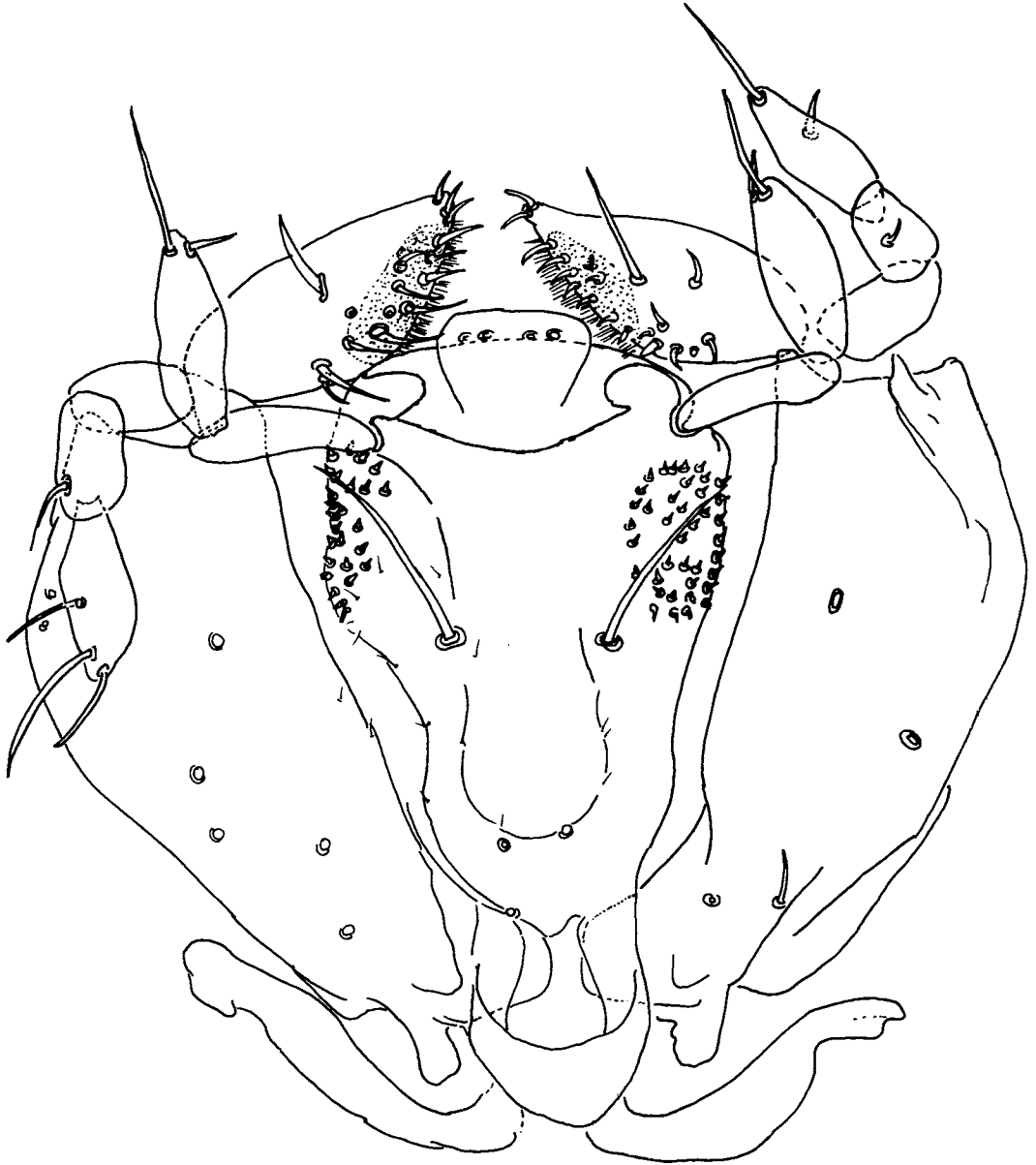
Fig. 110. Map of distribution, Silvestrii group.



Figs. 111-116. Worker (head, frontal view; profile): 111-112. *M. drifti* (holotype). 113-114. *M. incisus* (holotype). 115-116. *M. gnomus* (holotype). Scale bar = 1mm.

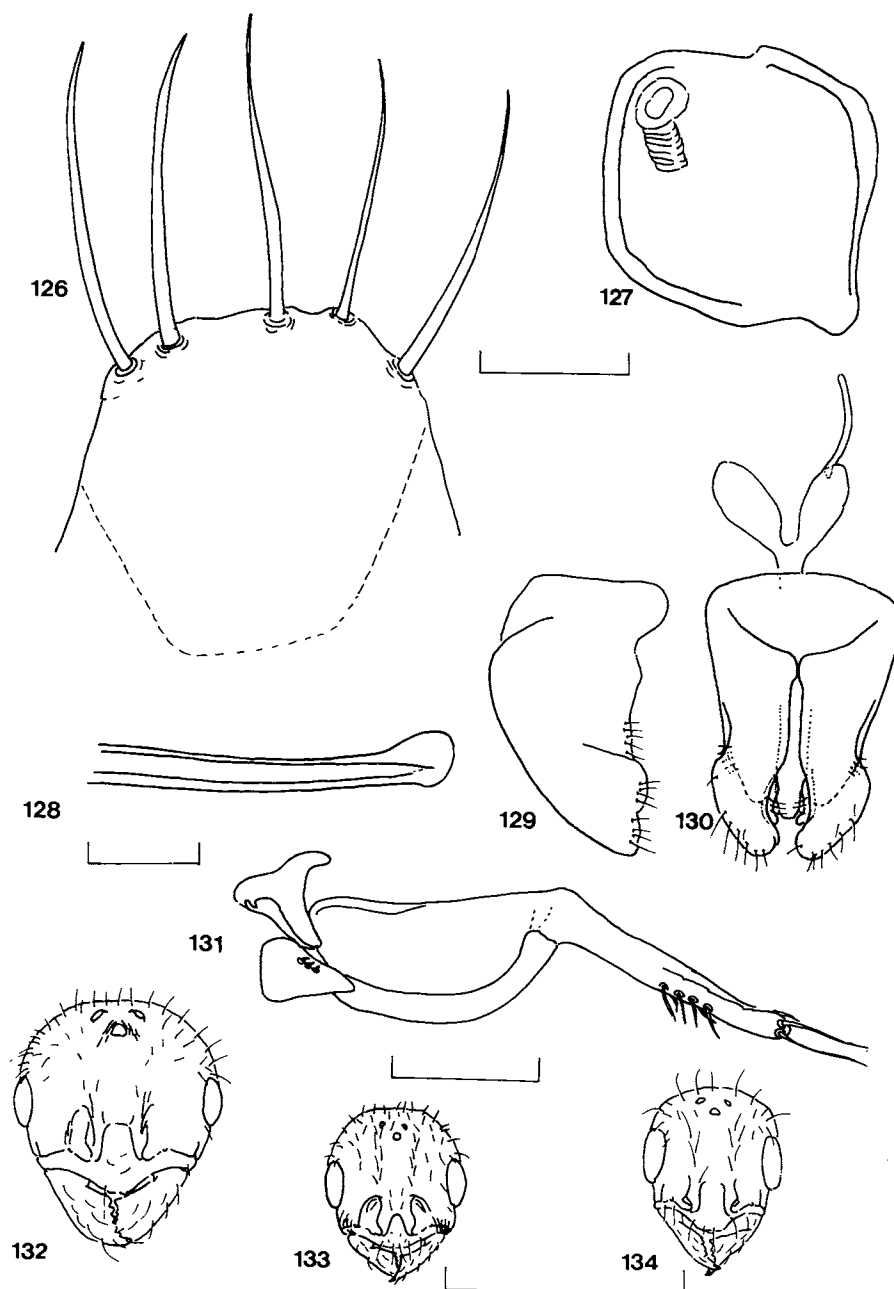


Figs. 117-124. Worker (head, frontal view; profile): 117-118. *M. miri*, sp. n. (holotype). 120-119. *M. myops* (lectotype). 121. same (detail 2 x). 123-122. *M. pusillus* (lectotype). 124. same (detail 2 x). Scale bar = 1mm.



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Figs. 125. Mouth apparatus, *M. drifti* (paratype, scale bar - .1mm).



Figs. 126-134. Venom apparatus *M. drifti* (paratype): 126. Anal plate. 127. Spiracular plate. 128. Apex. 131. total preparation. Male genitalia *M. drifti*: 129. side view. 130. frontal view - (Valle Chanchamayo, Peru). Queen (head, frontal view): 132. *M. pusillus* (Serra Geral, SC, Brasil). 133. *M. drifti* (Barro Colorado, CZ, Panama). 134. *M. incisus* (Rancho Grande, Aragua, Venezuela). Scale bar = .01mm (Figs. 126-128); = .1mm (Figs. 129-131).

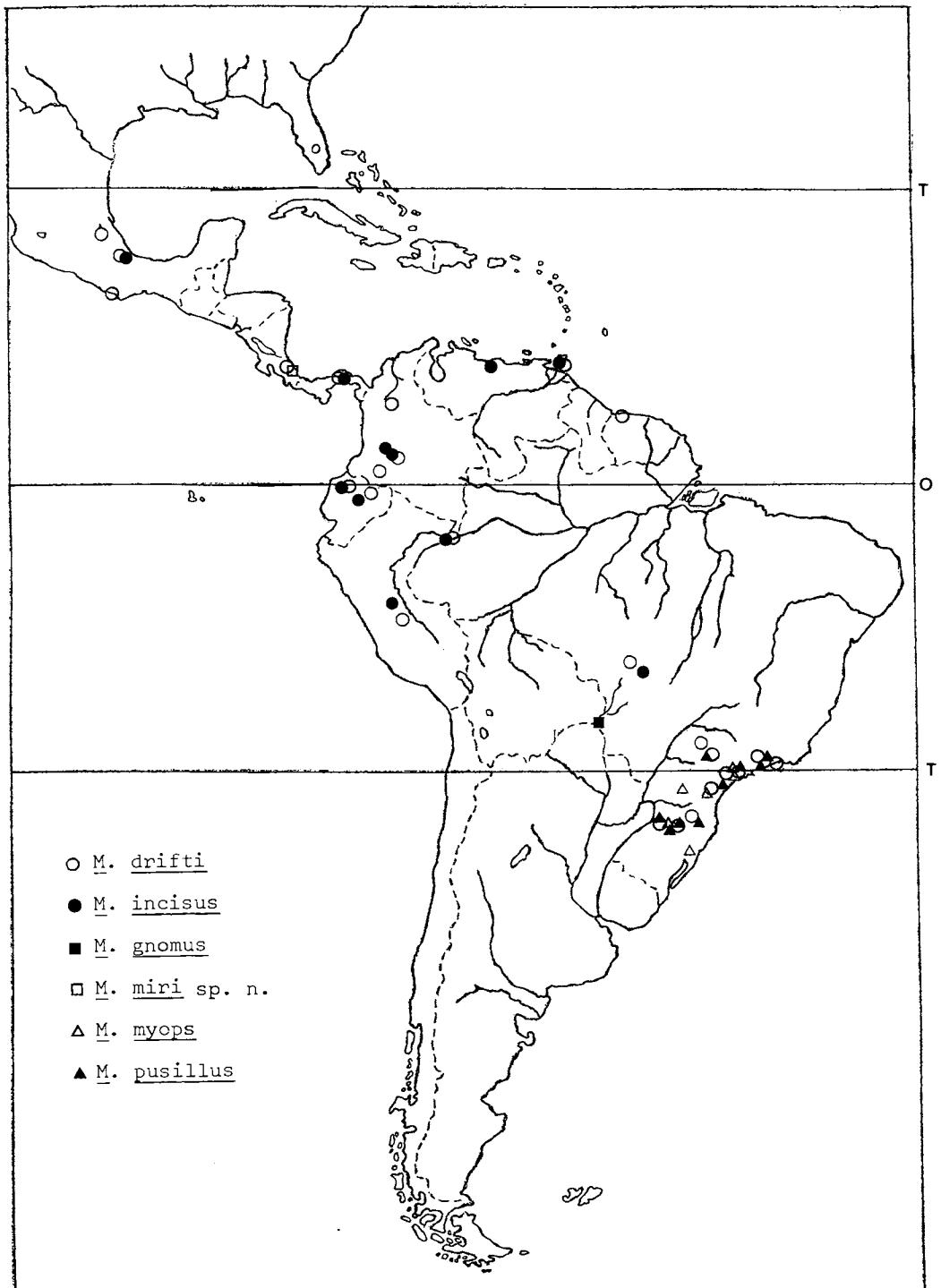


Fig. 135. Map of distribution, Pusillus group.

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