UNIVERSIDADE FEDERAL DE SÃO CARLOS

CENTRO DE CIÊNCIAS BIOLÓGICAS E DA SAÚDE

PROGRAMA DE PÓS-GRADUAÇÃO EM ECOLOGIA E RECURSOS NATURAIS

Consideracões taxonômicas sobre os Banchinae e revisão das espécies brasileiras de Glyptini (Hymenoptera: Ichneumonidae)

Taxonomic obsevations about the Banchinae and revision of the brazilian species of Glyptini (Hymenoptera: Ichneumonidae)

ANDRÉS FABIÁN HERRERA FLÓREZ

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Dissertação de Mestrado

CONSIDERACÕES TAXONÔMICAS SOBRE OS BANCHINAE E REVISÃO DAS ESPÉCIES BRASILEIRAS DE GLYPTINI (HYMENOPTERA: ICHNEUMONIDAE)

ANDRÉS FABIÁN HERRERA FLÓREZ

Dissertação apresentada ao Programa de Pós-Graduação em Ecologia e Recursos Naturais da Universidade Federal de São Carlos como parte dos requisitos para a obtenção do título de Mestre em Ecologia e Recursos Naturais. Área de concentração: Ecologia e Recursos Naturais.

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Aprovada em 07 de junho de 2010

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Dedico este trabajo a mis padres Gustavo Hernán y Nelly y a mi hermano Gustavo Adolfo

"...e os livros que me disseram tudo sobre a vespa,

exceto por quê?"

Dylan Thomas, "O Natal duma Criança em Gales"

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SUMMARY

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RESUMO

Banchinae é uma subfamília cosmopolita de Ichneumonidae composta por três tribos: Atrophini, Banchini e Glyptini, inclui cerca de 50 gêneros e cerca de 1500 espécies descritas. Os Banchinae geralmente possuem ovipositor longo entalhado no ápice, propodeo sem ou com poucas carenas e freqüentemente, tergito I com espiráculos localizados próximos ao centro ou antes do mesmo, e parte anterior da carena submetapleural dilatada num lobo largo. Este trabalho é uma revisão taxonômica da subfamília Banchinae com ênfase nas espécies brasileiras da tribo Glyptini. Esta tribo é caracterizada pela presença de ranhuras oblíquas sobre os tergitos II-IV. Este estudo baseia-se nas principais coleções entomológicas do Sul e Sudeste do Brasil. No total mais de 3.000 exemplares da subfamília foram examinados, não incluindo todos os gêneros já registrados para o Brasil. Material de 17 dos 27 estados do Brasil foi revisado, embora a maioria dos espécimes (70,3%) tenha sido coletada no Estado de São Paulo. A subfamília Banchinae foi registrada até o momento em quatro tipos de biomas brasileiros: Mata Atlântica, Cerrado, Amazônia e agroecossistemas, entre os dois e 2.039 m de altitude. O estudo revelou a presença no Brasil de 17 gêneros de Banchinae, um deles um novo para a ciência; 18 novas espécies da tribo Glyptini são descritas. Chaves ilustradas são apresentadas para permitir a identificação das tribos e gêneros da subfamília Banchinae e as espécies da tribo Glyptini do Brasil.

ABSTRACT

The Banchinae is a cosmopolitan group of Ichneumonidae comprising three tribes: Atrophini, Banchini and Glyptini; it includes about 50 genera and 1500 described species. The Banchinae generally have long, apically notched ovipositor, a propodeum without or with only a few carinae, and frequently, a tergite I with spiracles located around or before the centre, and the anterior part of the submetapleural carina expanded into a broad lobe. This work is a taxonomic revision of the subfamily Banchinae with emphasis in the tribe Glyptini from Brazil. This tribe is characterized by the possession of oblique grooves on tergites II-IV. This study is based on the main entomological collections of South and Southeastern Brazil; in total more than 3.000 specimens of the subfamily have been examined, not including all of genera already registered to Brazil. Material from 17 of the 27 States of Brazil has been reviewed, although most of the specimens (70.3%) were collected in São Paulo State. The subfamily Banchinae has been registered so far in four kind of Brazilian biomes: Atlantic Forest, Brazilian Savanna, Amazonia and agroecosystems, between 2 and 2.039 m of altitude. The study has revealed the presence in Brazil of 17 genera of Banchinae, one of them is a new genus; 18 new species of the tribe Glyptini are described. Illustrated keys are given to enable the identification of the tribes and the genera of the subfamily Banchinae and the species of the tribe Glyptini from Brazil.

1 INTRODUCTION

In the Neotropical region a very small fraction of the biota is known, because in most tropical countries there are no adequate and representative collections, which leads to taxonomic studies of limited use (GAULD, 2000), or there are not enough researchers to study every group (DE SANTIS, 1980). Taxonomic works are basic to any group of organisms to be treated by other fields of Science, to improve their understanding, acquire a deeper ecological knowledge, and be used for the benefit of man, when this group lends itself to this (GAULD *et al*, 2002). This is the case of the parasitoid wasp family Ichneumonidae. Banchinae is a large and cosmopolitan subfamily of Ichneumonidae comprising around 1.500 described species worldwide classified into 50 genera. They are a very common and conspicuous component of most regions in tropical and temperate ecosystems, are parasitoids of a wide variety of lepidopteran larvae, being commonly collected, having for that reason considerable interest as a source of biological control agents (GAULD *et al*, 2002). The subfamily Banchinae comprises three tribes: Atrophini, Glyptini and Banchini. All of them are cosmopolitan, however, Atrophini is particularly large and diverse in the Neotropics.

To date, the only study about the subfamily Banchinae in the Neotropical region, was conducted by GAULD *et al.* (2002) to Costa Rica. Before him, Banchinae (especially the tribe Atrophini) was considered one of the most difficult groups to work, due to the few salient morphological characters, making both the separation of species and their arrangement into monophyletic groups challenging. Moreover, many of their accepted genera were not well defined (GAULD *et al.*, 2002). In Brazil there are studies about the ichneumonid subfamilies Camploplegina, Ophioninae, Cremastinae, Pimplinae, Metopiinae, Tryphoninae and Cryptinae. Because there are not comprehensive taxonomic revisions about the subfamily Banchinae in Brazil, the number of genera and species of this group in the country is

uncertain; the only information we have is a product of overly general works (e.g. KUMAGAI & GRAF, 2000; COSTA LIMA, 1962), isolated and / or very specific ones (e.g. LÓPEZ, 1935; GRAF, 1979a; GRAF 1979b; GRAF, 1984; GRAF, 1985) or difficult to compare and interpret, because they are too old and succinct, and their descriptions are based on few morphological characters (e.g. BRULLÉ, 1846). KUMAGAI & GRAF (2000) in a study conducted in rural area of the city of Curitiba, PR, Brazil collected 168 specimens of Banchinae, identifying 12 genera and 40 morphospecies; the founded genera were: *Glypta* Gravenhorst, 1829 (tribe Glyptini), *Exetastes* Gravenhorst, 1829 (tribe Banchini), and nine genera of the tribe Atrophini: *Hapsinotus* Townes, 1970, *Deleboea* Cameron, 1903, *Mnioes* Townes, 1946, *Lissonota* Gravenhorst, 1829, *Hadrostethus* Townes, 1970, *Syzeuctus* Förster, 1869, *Procestus* Townes, 1970, *Diradops* Townes, 1946, and *Eudeleboea* (junior synonym of *Meniscomorpha* Schmiedeknecht, 1907). This project proposes the first taxonomic study about the subfamily Banchinae in Brazil, with main focus in the tribe Glyptini.

1.1 Justification

The knowledge about specific groups of parasitoids that are of common occurrence and big abundance and could re-create the environments that they occupied, bringing useful information, are important in the conservation’s decisions.

2 OBJECTIVES

2.1 General Objectives

- Contribute to the taxonomic knowledge of the subfamily Banchinae (Hymenoptera: Ichneumonidae) in Brazil.

2.2 Specific Objectives

- to define the tribes and the genera of the subfamily Banchinae present in Brazil;
- to develop taxonomic keys for the identification of these tribes and genera;
- to determine within each genus of the tribe Glyptini which species occur in Brazil, and to develop a taxonomic key for the identification of these species, describing them;
- to describe new taxa for the Science belonging to Glyptini tribe;
- to organize a reference collection for identification of the genera of the subfamily Banchinae in Southeast of Brazil;
- to register the biomes in which each taxa studied occurs in Brazil;
- to determine if there are a period of the year in that is more likely to collect specimens of Banchinae.

3 MATERIAL AND METHODS

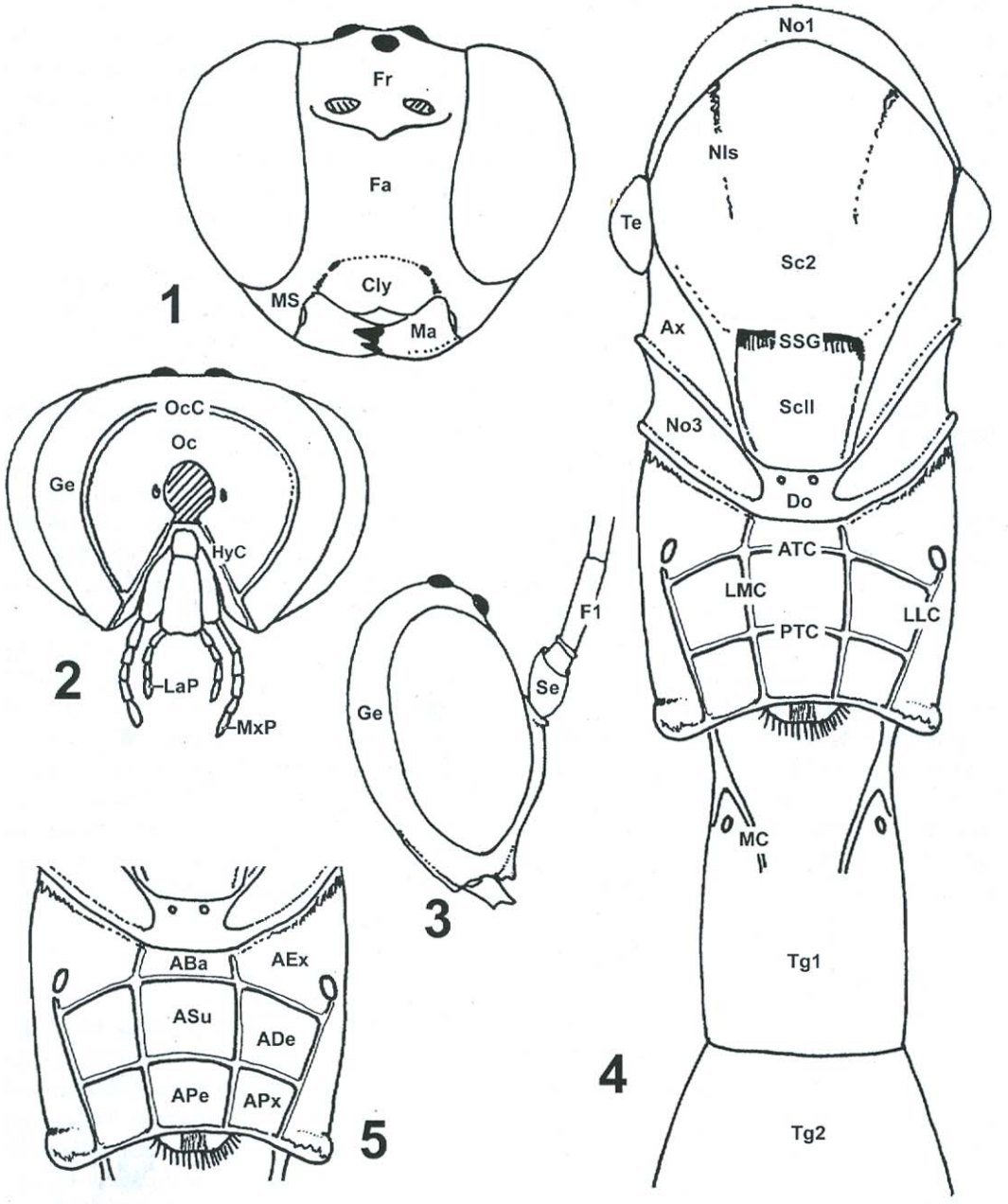
The material included in this revision was obtained in the main entomological collections of the Southeast and South of Brazil: Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos, São Carlos, SP, Brasil (DCBU), Universidade Federal de Paraná (UFPR), Museu de Zoologia Universidade de São Paulo (MZUSP), Universidade Federal de Espírito Santo (UFES), Universidade Federal de Rio de Janeiro (UFRJ), Coleção entomológica Instituto Oswaldo Cruz (CEIOC), and material from the Project Biota Noroeste UNESP São José de Rio Preto (UNESP-SJRP). Type material was not available to us, but species treated in this study were identified using the keys of GAULD *et al*. (2002) or through comparison with the original descriptions.

The nomenclatural treatment, morphological terminology and taxonomic characters used here follow GAULD (1991) and GAULD *et al*. (2002). The main striking characteristics of each described species are illustrated through SEM (Quanta 250) in low vacuum mode and digital photographs in stereomicroscope with Automontage software. Some photographs extracted from GAULD *et. al*. (2002) were here used with permission of the authors.

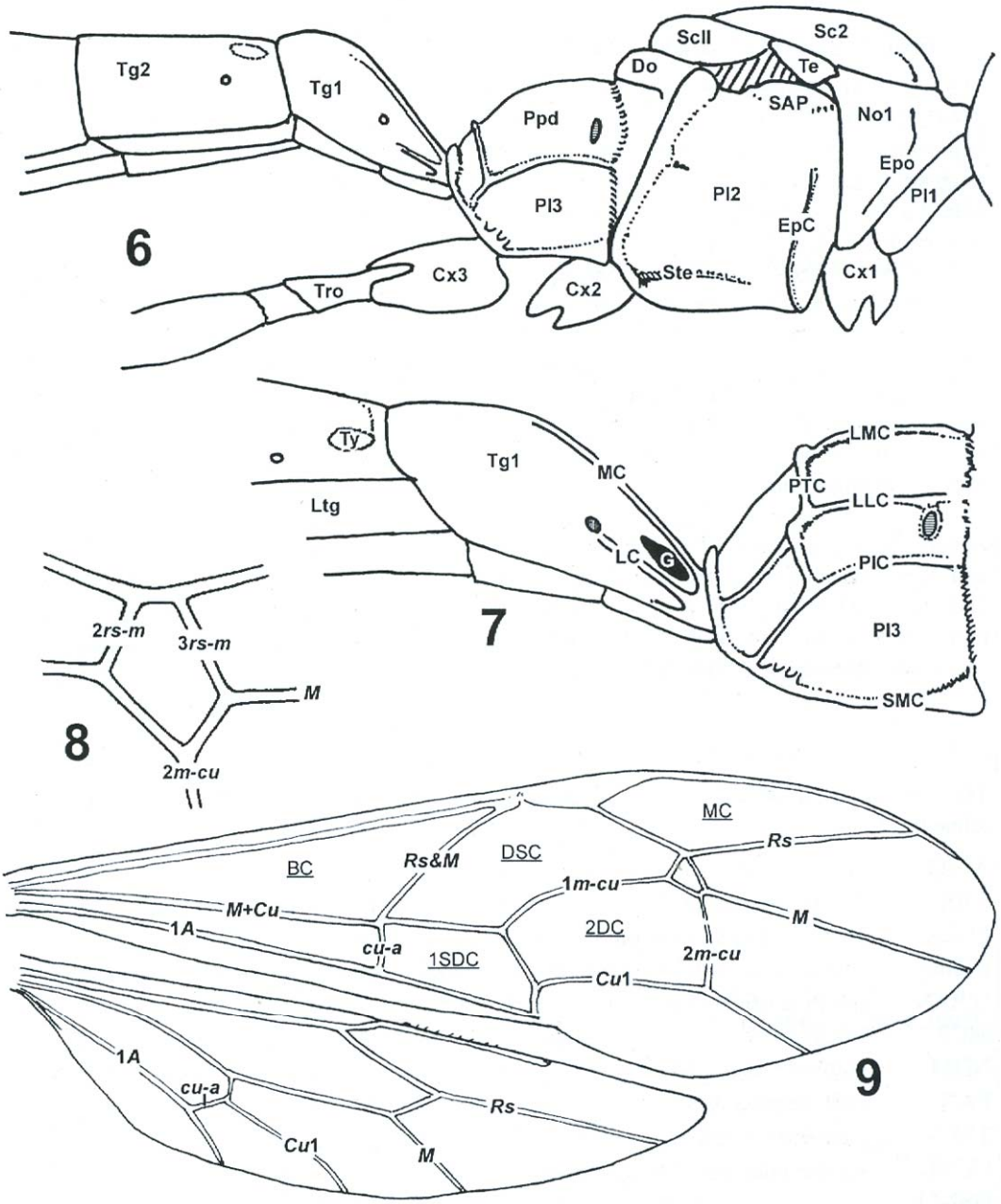
Part of the results section is written in the form of a set of scientific papers in its final form for submission to publication, within the aspects, items and revised standards set by 4 different journals, hereafter:

- **Zootaxa** - “Two new species of *Zaglyptomorpha* Viereck, 1913 (Hymenoptera: Ichneumonidae) from Brazil”.
- **Journal of Natural History** - “Ten new species of *Zaglyptomorpha* (Hymenoptera: Ichneumonidae: Banchinae) from Brazil”.

- **Revista de Biologia Tropical** - "Five new species of the genus *Sphelodon* (Hymenoptera: Ichneumonidae: Banchinae) from Brazil with a key to the Brazilian species".
- **Canadian Entomologist** - "New species of *Glypta* (Hymenoptera: Ichneumonidae) from Brazil".



Figs 1-5. Stylised ichneumonid labelled to show morphological terminology. Fig. 1, head, in anterior view; Fig. 2, head, in posterior view; Fig. 3, head, in lateral view; Fig. 4, mesosoma and the anterior part of metasoma, dorsal view; Fig. 5, propodeum showing areae. Abbreviations used are: ABa = area basalis; ADe = area dentipara; AEx = area externa; APe = area petiolaris; APx = area posteroexterna; ASu = area superomedia; ATC = anterior transverse carina of propodeum; Ax = axilla; Cly = clypeus; Do = dorsellum (or postscutellum); F_1 = first flagellomere; Fa = face; Fr = frons; Ge = gena; HyC = hypostomal carina; LaP = labial palp; LLC = lateral longitudinal carina of propodeum; LMC = lateromedian longitudinal carina of propodeum; Ma = mandible; MC = (latero)median longitudinal carina of tergite I; MS = malar space; MxP = maxillary palp; Nls = notaulus; No_1 = pronotum; No_3 = metanotum; Oc = occiput; OcC = occipital carina (lower part of which is often called the genal carina); PTC = posterior transverse carina of propodeum; Sc_2 = mesoscutum; Scll = scutellum; Se = scape; Te = tegula; SSG = scuto-scutellar groove; $Tg_{1\text{-}2}$ = tergites I-II.



Figs 6-9. Stylised ichneumonid labelled to show morphological terminology. Fig. 6, mesosoma and the anterior part of metasoma, lateral view; Fig. 7, propodeum, metapleuron and tergites I-II, lateral; Fig 8, areolet of fore wing; Fig 9, fore and hind wings (abbreviations of cells are underlined and are BC = basal cell; DSC = discosubmarginal cell; 2DC = 2nd discal cell; MC = marginal cell; 1SDC = 1st subdiscal cell). Other abbreviations are: Cx_{1-3} = fore, mid and hind coxae; Do = dorsellum; EpC = epicnemial carina; Epo = epomia; G = glymma; LC = lateral longitudinal carina of tergite I; LLC = lateral longitudinal carina of propodeum; LMC = lateromedian longitudinal carina of propodeum; Ltg = laterotergite; MC = (latero)median longitudinal carina of tergite I; No_1 = pronotum; Pl_{1-3} = pro-, meso- and metapleuron; PlC = pleural carina; Ppd = propodeum; PTC = posterior transverse carina of propodeum; SAP = subalar prominence; Sc_2 = mesoscutum; Scll = scutellum; SMC = submetapleural carina; Ste = sternaulus; Te = tegula; Tg_{1-2} = tergites I-II; Tro = trochanter; Ty = thyridium.

4 RESULTS AND DISCUSSION

The subfamily Banchinae has been registered in Brazil from 0 to 2039 m, in four kind of biomes: Amazonia, Atlantic Forest, Brazilian Savanna and agroecosystem. The genera *Lissonota*, *Meniscomorpha* and *Syzeuctus* can be founded in all these kind of biomes (see Table 1). São Paulo was the State with more specimens reviewed (70.33%). It was obtained material from other 19 States, but all of them (especially those abroad South and Southeast region of Brazil) are underrepresented (see Table 2 in Appendices). Also, we did not get material from the others seven States of Brazil, so a more complete knowledge about the number and composition of the genera and the species of the subfamily Banchinae in Brazil it would be necessary to visit more collections around Brazil and to collect more in other regions, States and biomes (e.g. Caatinga, Campos Sulinos, Pantanal). About 17 genera of Banchinae were found to occur in Brazil, two of them, the genera *Cecidopimpla* (Atrophini) and *Neoexetastes* (Banchini) were already registered in the literature; twelve of these genera belong to the tribe Atrophini (one of them is a new genus), three to Glyptini and two to Banchini.

Three genera of the tribe Atrophini (*Lissonota*, *Mnioes* and *Hapsinotus*) and one of the tribe Glyptini (*Glypta*) would be new registers from Brazil according to YU & HORSTMANN (1997), and YU *et al*. (2005), however there were already registered by KUMAGAI & GRAF (2000).

Most of the specimens (91.12 %) reviewed in this work belong to the tribe Atrophini: *Syzeuctus* (25.65 %), *Meniscomorpha* (24.04 %) and *Diradops* (16.89 %) were the genera with more specimens reviewed.

Inside the tribe Glyptini, *Zaglyptomorpha* was the most numerous in species (13), morphospecies (five) and specimens (46), followed by *Sphelodon* (five species, two

morphospecies and 29 specimens). *Zaglyptomorpha* appears to be the genus more diverse of this tribe in Brazil, and *Glypta* the less. Concerning the genus *Glypta*, it seems to have the less number of species, both in Brazil and the Neotropical region in the tribe, However, as GAULD *et al*. (2002) found in Costa Rica 15 species of *Glypta* and five of *Sphelodon*, it is possible that when more collections were reviewed and more material is collected more species will be discovered. GAULD *et al*. (2002) said that many undescribed species occur throughout the region, and in Costa Rica specimens have been collected in higher elevation sites, above 2000 meters, so it would be worthwhile to collect in localities around and up this elevation in Brazil in order to have a better idea of the diversity of this genus. In the same sense, with the aim of estimate the real number of Neotropical species of the genus *Glypta* it would be necessary to review material from other countries of South America (especially the Andeans ones). Nevertheless, for a while, it seems to be a fact that the genus *Glypta* is much more diverse in the Nearctic region where about 311 species occur (YU & HORSTMANN, 1998; GAULD *et al.* 2002; YU *et al*., 2005) than in the Neotropical region.

The generic definition of *Glypta* says that its species lack a ring in the flagellum, however, the description of *G. rufipes* Spinola, 1851 from Chile says that it has one, so it would be important to examine the holotype in order to analize its generic position.

As GAULD *et al*. (2002) recognize, the genus *Zaglyptomorpha* may not be monophyletic and an investigation into the monophyly of this and other glyptine genera needs to examine more material from Tropical America. The swollen upper end of the epomia is an apomorphic character that has a considerable variation within the genus *Sphelodon*, and because this is the single character that TOWNES (1970), DASCH (1988) and GAULD *et al*. (2002) use to separate *Glypta* from *Zaglyptomorpha*, sometimes it is difficult to distinguish these two genera. GAULD *et al*. (2002) even states that one species group of *Zaglyptomorpha* (the *Z. bella* species-group) may be more closely related to the *wahli* species-group of *Glypta*,

than it is to other *Zaglyptomorpha* species. For that reason, although after the revision of the subfamily Banchinae of Costa Rica the basic taxonomic work into genus level is likely to be made with success in any country of tropical America, more effort will be necessary in order to have a better understanding of the phylogenetic relationships not only inside the tribe Glyptini, but also in the tribe Banchini and specially the complex tribe Atrophini.

From the tribe Glyptini, 18 new species are described. Most of the material of the tribe Glyptini that is treated here as belonging to a morphospecies came from Southern region of Brazil (Paraná and Santa Catarina States); although we visited the main entomological collection of the Parana State (i.e. UFPR), only about one third of the specimens of the Banchinae collection was loaned to be identified to generic level (i.e. from about 1200 mounted specimens of Banchinae, only around 400 were brought to São Carlos); also there were a lot of material in alcohol from the Project PROFAUPAR, that wasn't reviewed. In order to assess the spectrum of inter-and intraspecific variation, the ideal thing is to work with adequate samples, in a upcoming visit to the UFPR collection more material of this morphospecies is going to be search, specially from the same localities. There is also another entomological collection in Seara, Santa Catarina (i.e. The Museu Entomológico Fritz Plaumann) that could have more Glyptini specimens from some of those localities.

Meanwhile, *Zaglyptomorpha* morphospecies B is not treated here as a new species, although the specimen has some clear differences with the holotype of *Z.* sp. nov. 4, that was collected in the same locality; more material is necessary in order to be sure about if they are in fact two different species.

Regarding *Sphelodon* morphospecies B, although it is almost certain that it represents a new species, it wasn't included in the paper about the new species of this genus, because more material is expected to be collected and a different paper is being prepared with its description and that of two other new species of different genera of Banchinae (*Diradops*

and *Meniscomorpha*) related with the plant species *Croton floribundus* (Euphorbiaceae) (i.e. their hosts were collected feeding on this plant).

About 10 species (76.92% of the species) and the five morphospecies of *Zaglyptomorpha* occur in the Atlantic Forest biome; three species (23.08% of the species) are registered from the Brazilian Savanna biome (Table 3 in Appendices).

Three species and the two morphospecies of *Sphelodon* are registered from the Atlantic Forest; one species occurs in the Amazonia Biome and one species' biome is uncertain: it was collected in Botucatu, SP, so it could be collected in Atlantic Forest, Brazilian Savanna or in an agroecosystem (Table 3 in Appendices). Both the three species and the morphospecies of *Glypta* occur in the Atlantic Forest Biome.

The specimens in virtually all genera of Banchinae have been more collected in the rainy season (i.e. between the months of October and May) (Table 4 in Appendices). The only exceptions are the genera *Hapsinotus*, *Sphelodon* and the new genus, which specimens were more collected in the dry season (i.e. from May throughout September) (Table 4 in Appendices).

Although a deeper study is needed, preliminary analysis of the reviewed material indicates that *Meniscomorpha* is the genus of Banchinae with more species in Brazil, which concurs with that found by GAULD *et al*. (2002) to Costa Rica.

Although nothing is known of the biology or host of the monotypic genus *Lissocaulus*, most of its specimens reviewed in this study (around 60%) were collected either in several kinds of plantations (e.g. organic garden, organic garden with curcubits plantation, conventional guava plantation), or in suburban gardens, which also happened in Costa Rica (GAULD *et al.*, 2002). That may be related with the presence in those environments of its

host and could indicate a certain level of adaptation of *L. emaceratus* (Cresson) to degraded environments.

Illustrated keys are given to enable the identification of the tribes and the genera of the subfamily Banchinae and the species of the tribe Glyptini from Brazil.

Table 1. Number of specimens, Relative Frequency, Altitude and Biomes of the genera of Banchinae found in this work.

	No. of Specimens	**Relative Frequency (%)**	**Altitudinal distribution**	**Biomes and environments**
Banchinae	2421	_	0-2039 m	
Banchini	123	5.08	714-1880 m	
Exetastes	123	5.08	714-1880 m	Atlantic Forest, Brazilian Savanna.
Atrophini	2206	91.12	0-2039 m	
Diradops	409	16.89	25-1700 m	Amazonia, Atlantic Forest, Brazilian Savanna.
Hadrostethus	24	0.99	550-1500 m	Atlantic Forest
Hapsinotus	4	0.16	2-750 m	Amazonia, Atlantic Forest.
Lissocaulus	47	1.94	434-1260 m	Atlantic Forest, Brazilian Savanna, agroecosystems (e.g. organic garden, organic garden with curcubits plantation), conventional guava plantation.
Lissonota	65	2.68	60-2039 m	Amazonia, Atlantic Forest, Brazilian Savanna, organic garden, coffe plantation.

continues in next page

Table I. Continuation

	No. of Specimens	**Relative Frequency (%)**	**Altitudinal distribution**	**Biomes**
Meniscomorpha	582	24.04	50-1380 m	Amazonia, Atlantic Forest, Brazilian Savanna, agroecosystems (e.g. organic garden, organic garden with curcubits plantation, garden certified by the Bio-dynamic Institute), coffe plantation, reforestation, pasture area.
Mnioes	218	9	4-2000 m	Amazonia, Atlantic Forest, Brazilian Savanna, agroecosystems (e.g. organic garden, organic garden with curcubits plantation, garden certified by the Bio-dynamic Institute), coffe plantation.
Occia	61	2.52	25-900 m	Amazonia, Atlantic Forest, Brazilian Savanna
Procestus	1	0.04	520-642 m	Atlantic Forest, Brazilian Savanna.
Syzeuctus	621	25.65	25-970 m	Amazonia, Atlantic Forest, Brazilian Savanna, agroecosystems (e.g. organic garden, garden certified by the Bio-dynamic Institute), coffe plantation, reforestation.
New genus	183	7.56	60-1200 m	Atlantic Forest, Brazilian Savanna.
Glyptini	92	3.8	40-1200 m	
Glypta	7	0.29	80-1200 m	Atlantic Forest
Sphelodon	29	1.2	40-200 m	Amazonia, Atlantic Forest, Brazilian Savanna*
Zaglyptomorpha	46	1.9	833m	Atlantic Forest, Brazilian Savanna.

* Although not included in this work, there is some material from this biome (e.g. Chapada dos Guimarães, MT).

4.1 Key to tribes of Banchinae occurring in Brazil (adapted from GAULD *et al*. 2002)

1. Hind wing length of abscissa of *Cu*1 between *M* and *cu-a* 0.2 or less times as long as the combined lengths of this vein and *cu-a* (Fig.7)……...…….....….....2

- Hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* more than 0.3 times as long as the combined lengths of this vein and *cu-a* (Fig.8), or rarely with distal abscissa of *Cu*1 entirely absent ….....3

2. Fore wing without vein 3*rs-m*, thus without an enclosed areolet (Fig.6); epicnemium with a short, vertical, tooth-like lamella near lower corner of pronotum (Fig. 4) ..... …….....….....**Atrophini** [Genus *Occia*]

- Fore wing with vein 3*rs-m* present enclosing a more or less rhombic areolet (Fig. 5); epicnemium without a tooth-like lamella near lower corner of pronotum….....….**Banchini**

3. Metasoma with tergites II,III and usually also IV with oblique lateromedian grooves that diverge posteriorly (Figs 2,3)……...……...**Glyptini**

-Metasoma with tergites II-IV simply convex, without any trace of lateromedian grooves (Fig. 1) …….....……..**Atrophini** [most]

4.2 Key to genera of Atrophini occurring in Brazil (adapted from GAULD *et al*. 2002)

1. Hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.2 or less times as long as the combined lengths of this vein and *cu-a* (Fig. 37). [Fore wing without vein 3*rs-m* (Fig. 34);

epicnemium with a short vertical tooth-like lamella near lower corner of pronotum (Fig.9)]

…….....……...***Occia***

- Hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* more than 0.3 times as long as the combined lengths of this vein and *cu-a* (Figs 38), or rarely with distal abscissa of *Cu*1 more or less absent (Fig. 39)…….....……..2

2. Tergite I of metasoma, in lateral view, with spiracle positioned well behind centre; inner margins of antennal sockets raised to form crests which extend upwards, meeting to form a conspicuous inverted V-shaped promontory between antennal sockets (Fig. 10)….....……

.....***Lissocaulus***

- Tergite I of metasoma, in lateral view, with spiracle positioned at or in front of the centre; inner margins of antennal sockets unspecialized, without an inverted V-shaped promontory between antennal sockets (Fig. 11)…….....……...3

3. Submetapleural carina narrow, only slightly and evenly broadened anteriorly (Fig. 12)…..4

- Submetapleural carina strongly and usually abruptly broadened anteriorly, generally forming a distinct lobe (Figs 13)…….....……7

4. Mesoscutum with notaulli impressed on anterior third or more (Figs 42-45).....……**New genera**

- Mesoscutum without impressed notauli, at very most with a weak shallow concavity anterolaterally (Fig. 14) …….....……..5

5. Lower face centrally quite strongly convex (Fig. 15); propodeum with lateromedian longitudinal carinae quite strongly developed (Fig. 27), discernible from anterior margin and extending back at least halfway to posterior transverse carina….....***Hapsinotus*** [few]

- Lower face flat to weakly convex (Fig. 16); propodeum generally without any trace of lateromedian longitudinal carinae (Fig. 28), at most with vestige on extreme anterior margin.....6

6. Metanotum with hind rim sublaterally expanded into a tooth-like projection (Fig. 17); fore wing without vein 3*rs-m*, with 2*rs-m* more than 2.0 and often more than 3.0 times as long as abscissa of *M* between 2*rs-m* and 2*m-cu* (Fig. 33); 2*m-cu* generally with two bullae separated by a short length of vein that usually bears a stub of a spurious vein. [Clypeus anteromedially weakly sclerotized, impressed so margin has a weak median apical notch (Fig. 16); rather granulate, weakly polished species]…….....……***Mnioes***

- Metanotum with hind rim simple, not appreciably sublaterally expanded into a small tooth-like projection, or with a small weak tooth (Fig. 18); fore wing usually with vein 3*rs-m* enclosing a small areolet (Fig. 35), or if absent then with 2*rs-m* less than 3.0 times as long as abscissa of *M* between 2 *rs-m* and 2*m-cu*; 2*m-cu* usually with a single long bulla……..……..***Lissonota*** [in part]

7. Mid tibia bearing numerous small denticles on outer surface (Fig. 21), and with spurs very unequal, the longer more than 2.0 times the length of the shorter (Fig. 20); propodeum with anterior transverse carina more or less complete and without lateral or lateromedian longitudinal carinae (Fig. 29)…….....……..***Procestus***

- Mid tibia without numerous small denticles on outer surface, and generally with spurs less strongly unequal, the longer often less than 2.0 times the length of the shorter; propodeum generally without any trace of anterior anterior transverse carina, but if one is discernible then so are the lateral and/or lateromedian longitudinal carinae…….....……..8

8. Metanotum with hind rim sublaterally expanded into a large flat denticle which points backwards to lateral longitudinal carina, and this carina usually discernible at least as a

tubercle anteriorly, sometimes complete. [Fore wing generally with 3*rs-m* absent]…..… .....***Hapsinotus*** [most]

- Metanotum with hind rim sublaterally not or only weakly expanded into a minute denticle; lateral longitudinal carina generally entirely absent….....……9

9 Fore wing with 3*rs-m* entirely absent, thus without any trace of an enclosed areolet (Figs 30, 32-34)….....……10

- Fore wing with 3*rs-m* present, generally completely enclosing a rhombic or oblique areolet, sometimes not quite reaching *M*, but in such cases the form of the areolet is quite clear (Figs 31, 35, 36)….....…..14

10. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.4-2.2 times as long as *Cu*1b (Fig. 35); tergite I of metasoma generally with distinct longitudinal wrinkling, and/or with lateromedian longitudinal carinae well-developed…….....…….***Lissonota***

- Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 0.3-1.3 times as long as *Cu*1b (Fig. 30); tergite I of metasoma from smooth and polished, to punctuate without any trace of longitudinal wrinkling, and at very most with lateromedian longitudinal carinae only present at extreme anterior end of tergite…….....……11

11. Females, ovipositor projecting beyond apex of metasoma……...……..12

- Males…….....……..13

12. Ovipositor moderately to very long, 1.2-3.4 times as long as the hind tibia.....…….. …….....…….....……***Meniscomorpha***

- Ovipositor short, 0.3-0.7 times as long as hind tibia….……..***Diradops***

13. Fore tibia with spur normally developed, 1.5-2.5 times as long as breadth of tibia and with part distal to membranous flange less than 1.5 times as long as the flange; lower face generally without a median vertical swelling, or if one is present then tergite II is more than 1.6 times as long as posteriorly broad; metasoma otherwise stout to slender, tergite II 1.1-2.5 times as long as posteriorly broad……...……...***Meniscomorpha***

- Fore tibia with spur very long and slender, 2.7-3.4 times as long as breadth of tibia and with part distal to membranous flange more than 1.5 times as long as the flange; lower face always with a median vertical swelling and metasoma rather short and stout, tergite II 0.7-1.3 times as long as posteriorly broad…….....……...***Diradops***

14 Lower part of occipital carina joining hypostomal carina at base of mandible; pronotum with epomia very long and strong, often with upper end raised into a strong flange (Fig. 24); frons usually with an oblique angulate prominence above each antennal socket. [Fore wing with areolet rhombic and generally elongately petiolate above (Fig. 31)]….……..***Syzeuctus***

- Lower part of occipital carina joining hypostomal carina above base of mandible; pronotum either without an epomia, or if one is present it is weak and short (Fig. 25); frons never with an oblique angulate prominence above each antennal socket…….....……15

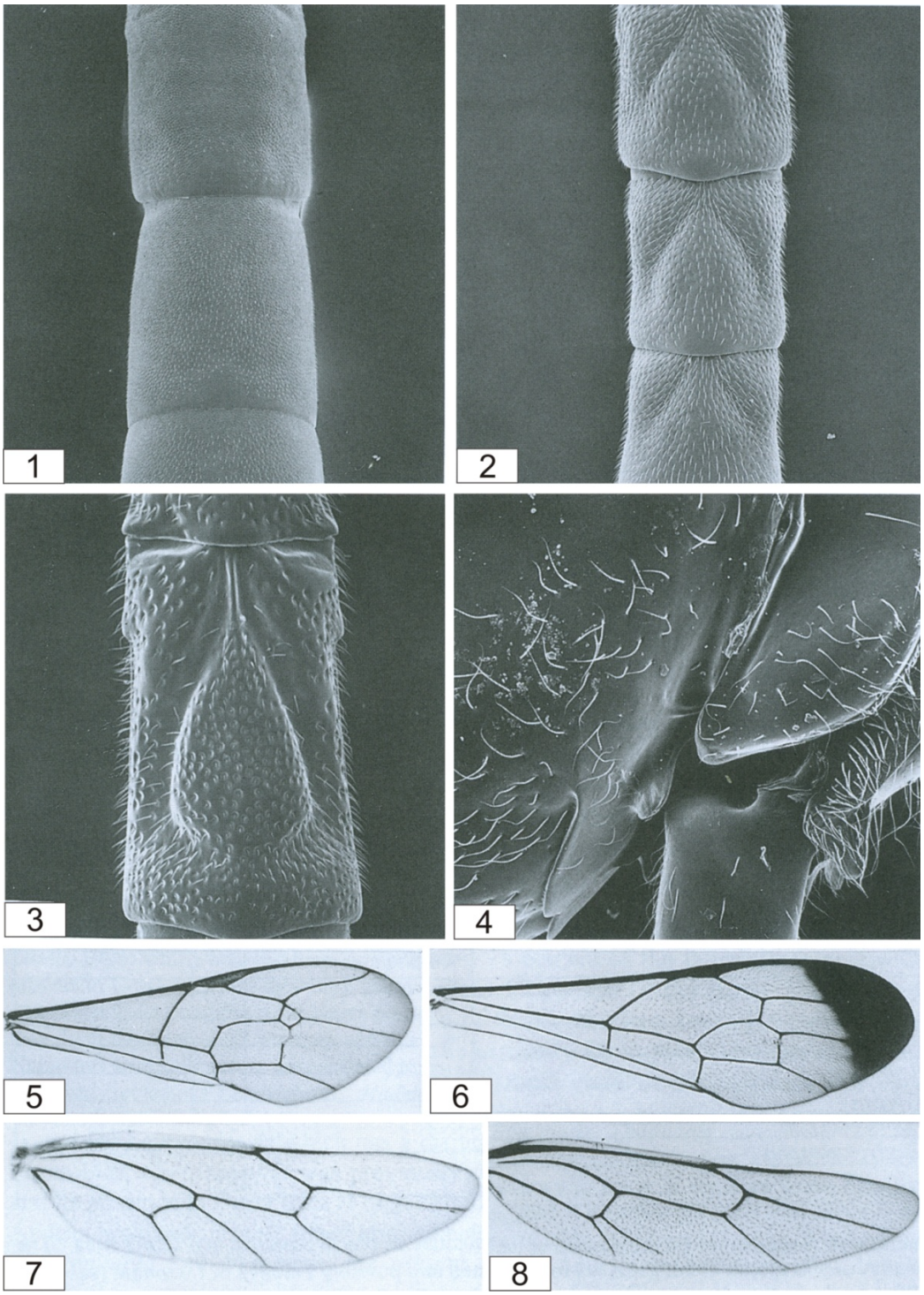
15. Ovipositor short, 0.3-0.5 times as long as the hind tibia; propodeum abruptly declivous, without a distinct posterior transverse carina, at most with a central vestige present (Fig. 26); submetapleural carina with anterior lobe angulate posteriorly…...……...***Hadrostethus***

- Ovipositor longer, equal to or longer than hind tibia; propodeum evenly rounded posteriorly, with a more or less distinct posterior transverse carina that is usually complete, or at least discernible broadly centrally (Fig. 28); submetapleural carina with anterior lobe often smoothly rounded or evenly narrowed posteriorly…….....……..16

16. Metasoma with tergite I, in profile, very strongly convex, almost pyramidal; tergite II (and to a lesser extent also tergites I and III) with a post-median transverse impression (Fig. 41); ovipositor 1.6 or less times as long as hind tibia……..……...***Cecidopimpla***

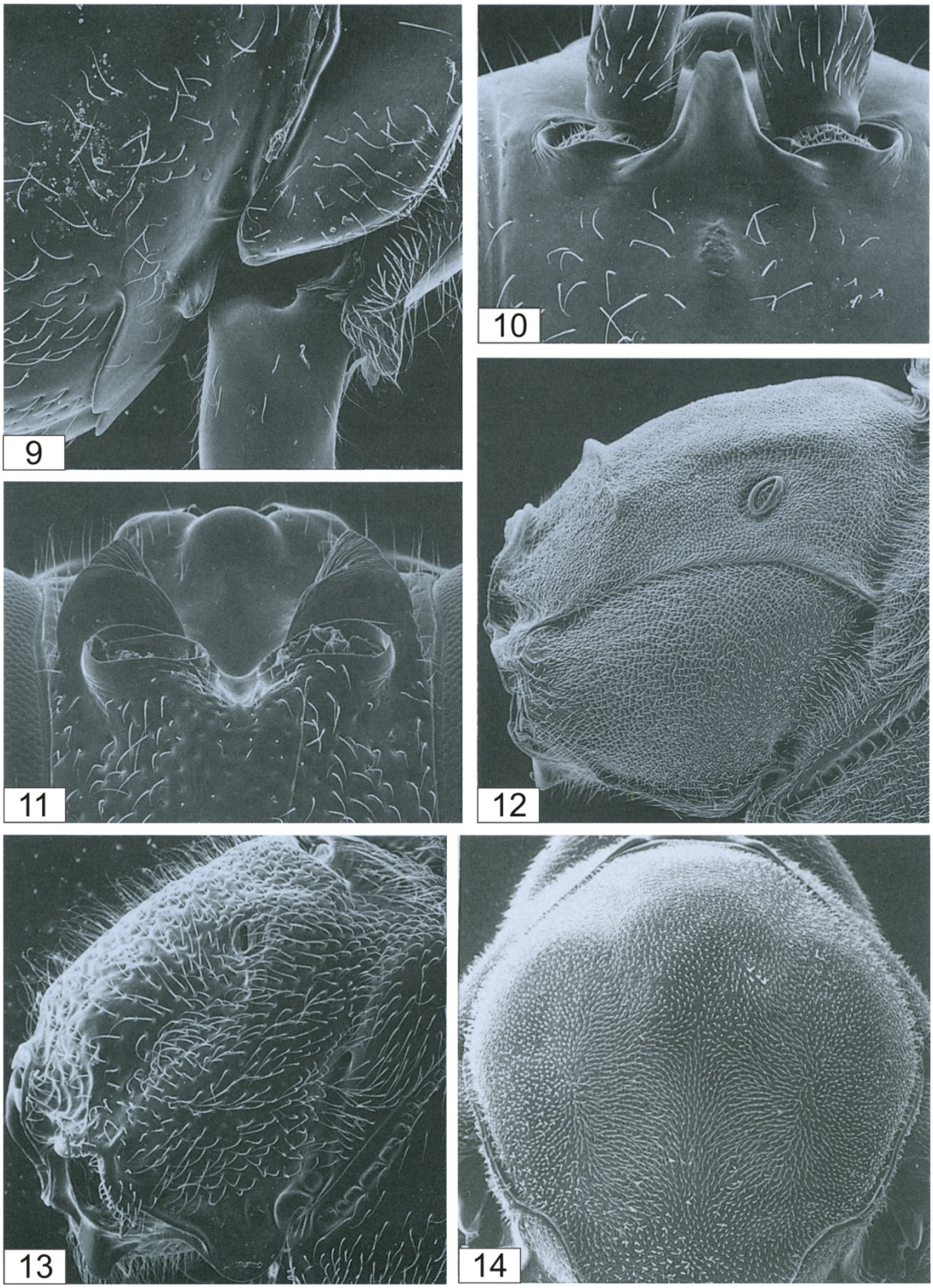
- Metasoma with tergite I, in profile, from flat to evenly convex; tergite II without a post-median transverse impression; ovipositor 1.7 or more (generally more than 2.0) times as long as hind tibia…….....……..***Lissonota***

Figures



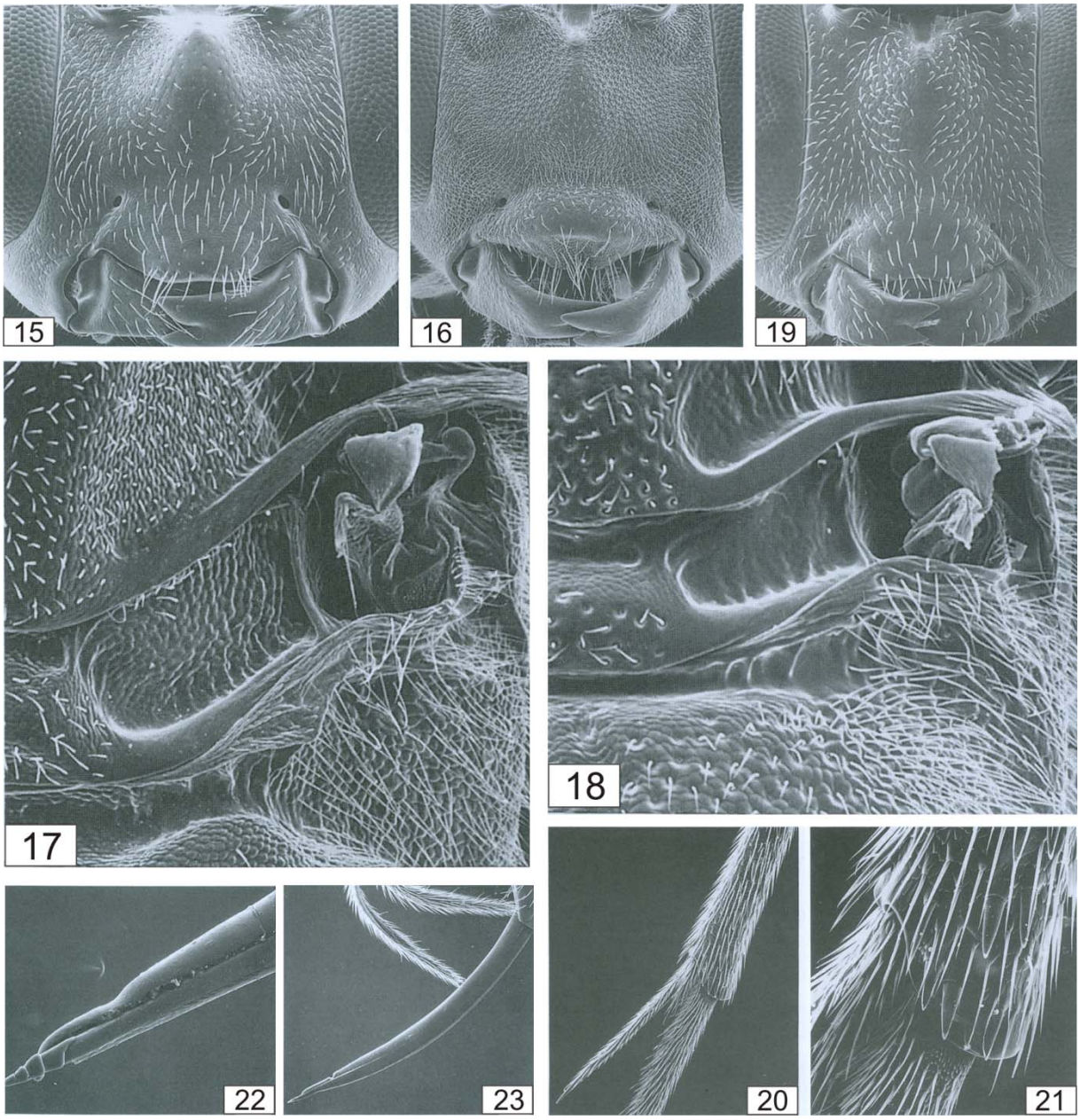
Figs 1-8. Taken from GAULD *et al*. (2002) with permission of the authors. Banchinae. Figs 1-3. Stereoscan photographs of metasomal tergites, dorsal; 1, *Mnioes* sp.; 2, *Glypta* sp.; 3, *Zaglyptomorpha* sp. Fig. 4. *Occia* sp., stereoscan photograph of fore coxa and anteroventral

part of mesosoma, lateral. Figs 5-8. Fore wing; 5, *Exetastes* sp.; 6, *Occia* sp. Figs 7-8. Hind wing; 7, *Exetastes* sp.; 8, *Mnioes* sp.

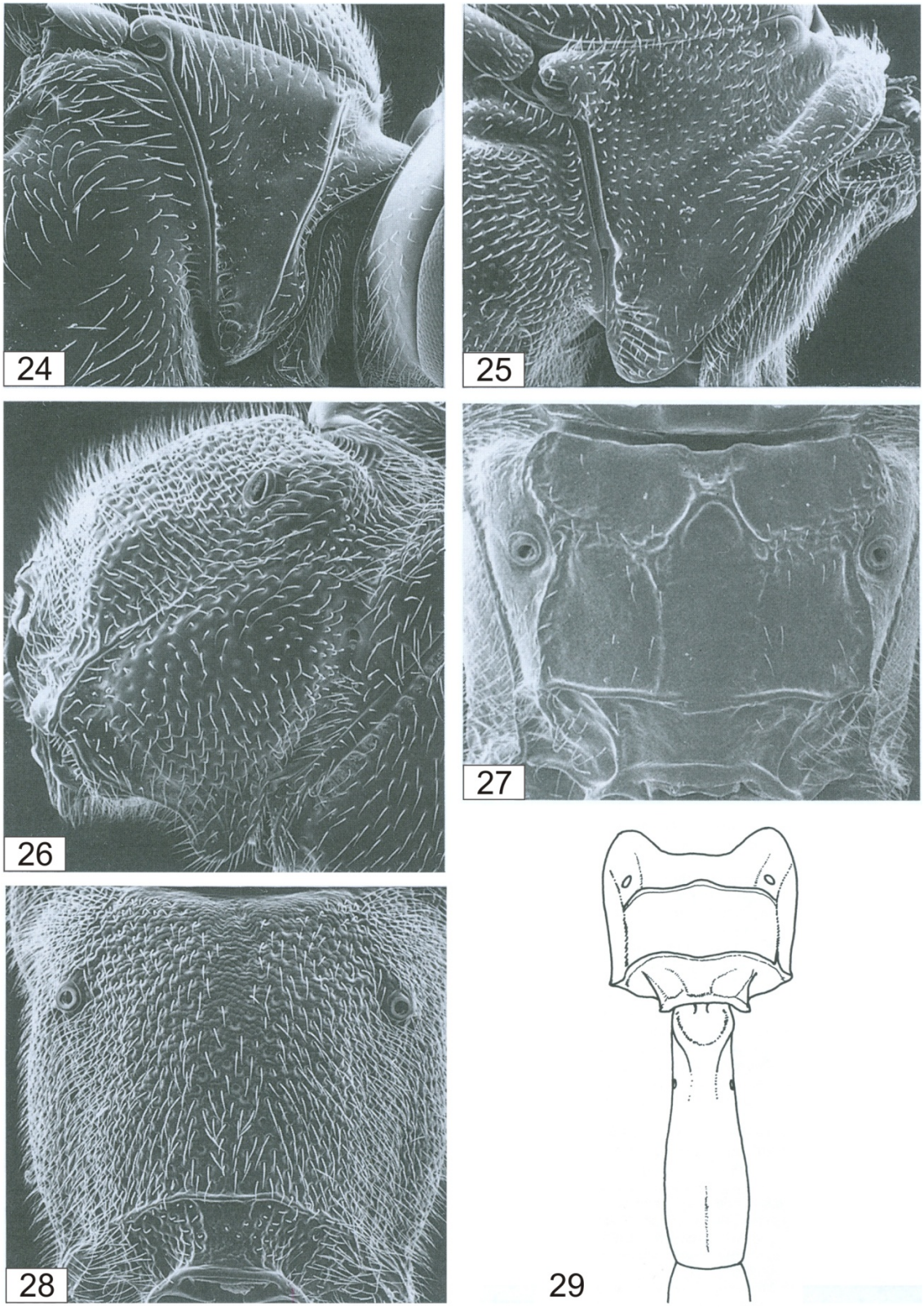


Figs 9-14. Taken from GAULD *et al*. (2002) with permission of the authors. Stereoscan photographs of Atrophini. Fig. 9. *Occia* sp., fore coxa and anteroventral part of mesosoma,

lateral. Figs 10-11. Frontal region of head; 10, *Lissocaulus* sp.; 11, *Syzeuctus* sp. Figs 12-13. Metapleuron, lateral; 12, *Mnioes* sp.; 13, *Diradops* sp.; 14, Mesoscutum, *Mnioes* sp.

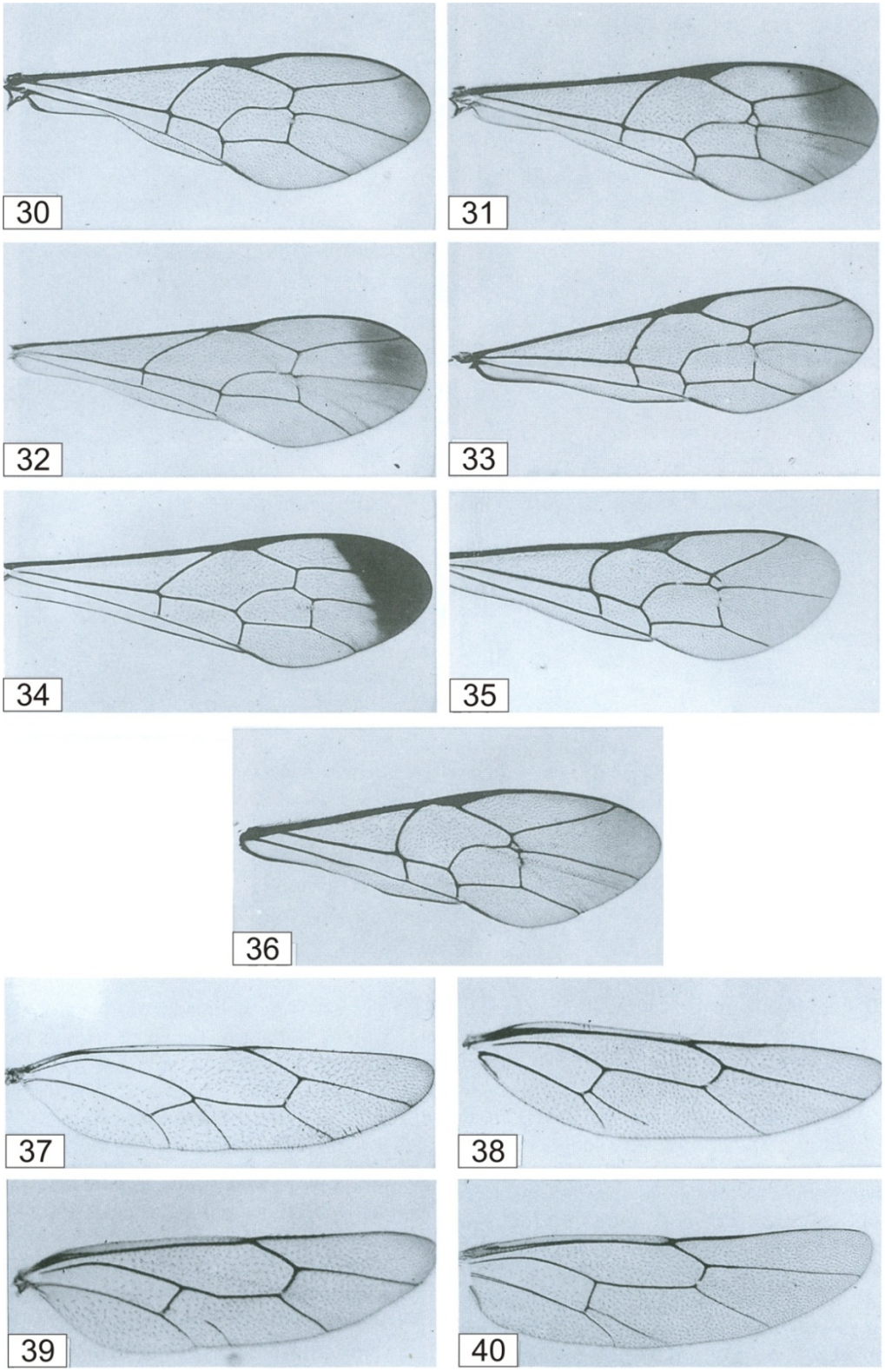


Figs 15-23. Taken from GAULD *et al*. (2002) with permission of the authors. Stereoscan photographs of Atrophini. Figs 15-16. Lower face; 15, *Hapsinotus* sp.; 16, *Mnioes* sp.; 17-18. Metanotal region; 17, *Mnioes* sp.; 18, *Lissonota* sp. Fig. 19, lower face; *Lissonota* sp.; 20-21. *Procestus* sp.; 20, mid tibia and spurs; 21, mid tibia showing denticles. Figs 22-23. Apex of ovipositor; 22, *Lissonota* sp.; 23, *Diradops* sp.



Figs 24-29. Taken from GAULD *et al*. (2002) with permission of the authors. Stereoscan photographs of Atrophini. Figs 24-25. Pronotum, lateral; 24, *Syzeuctus* sp.; 25, *Lissonota* sp.

Fig. 26. Propodeum, lateral, *Hadrostethus* sp. Figs 27-28. Propodeum, dorsal; 27, *Hapsinotus* sp.; 28, *Lissonota* sp.; 29, *Procestus* sp.



Figs 30-40. Taken from GAULD *et al*. (2002) with permission of the authors. Atrophini. Figs 30-36. Fore wings; 30, *Meniscomorpha* sp.; 31, *Syzeuctus* sp.; 32, *Procestus* sp.; 33, *Mnioes*

sp.; 34, *Occia* sp.; 35, *Lissonota* sp.; 36, *Hadrostethus* sp. Figs 37-40. Hind wing; 37, *Occia* sp.; 38, *Mnioes* sp.; 39, *Syzeuctus* sp.; 40, *Lissonota* sp.

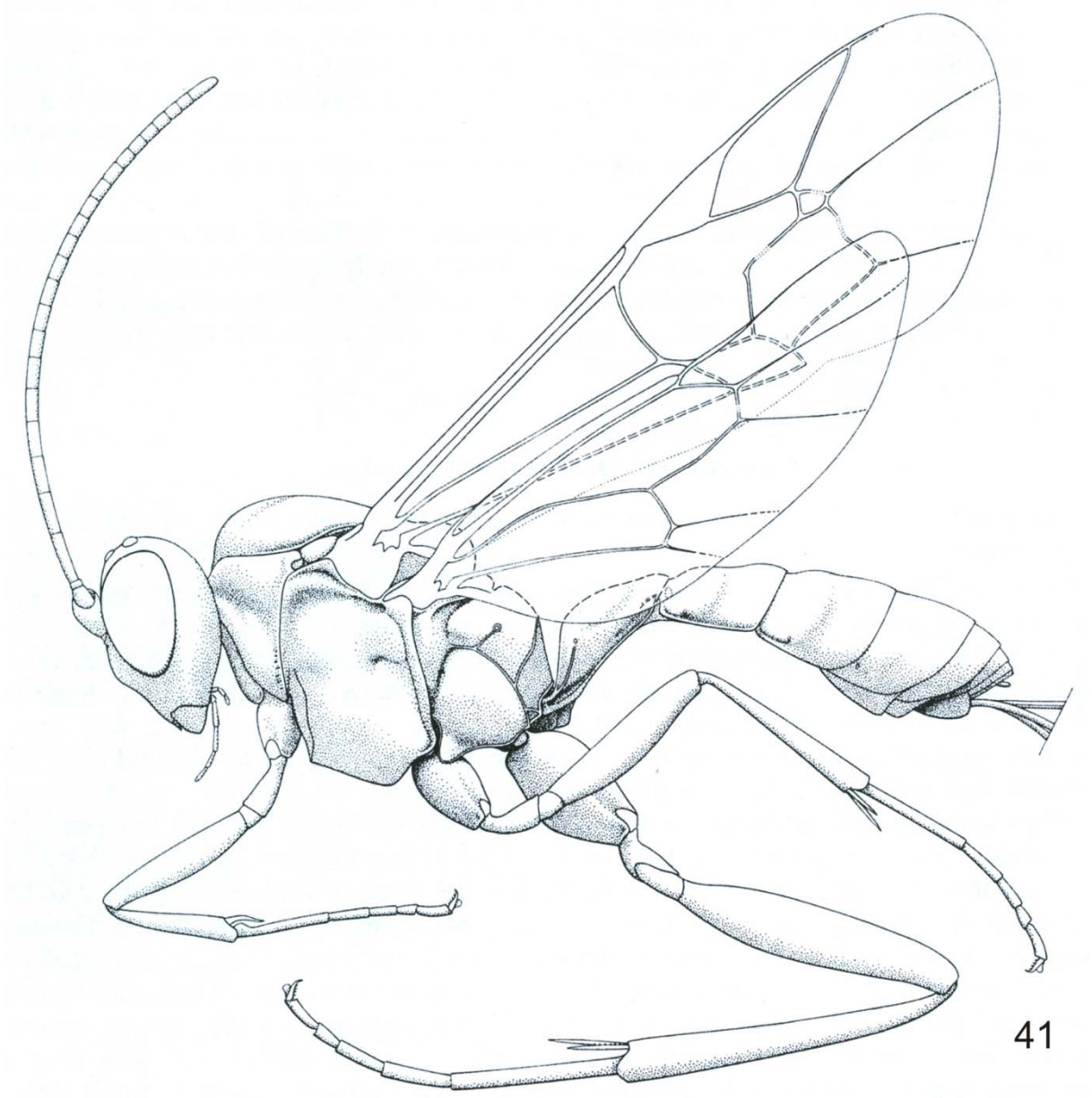
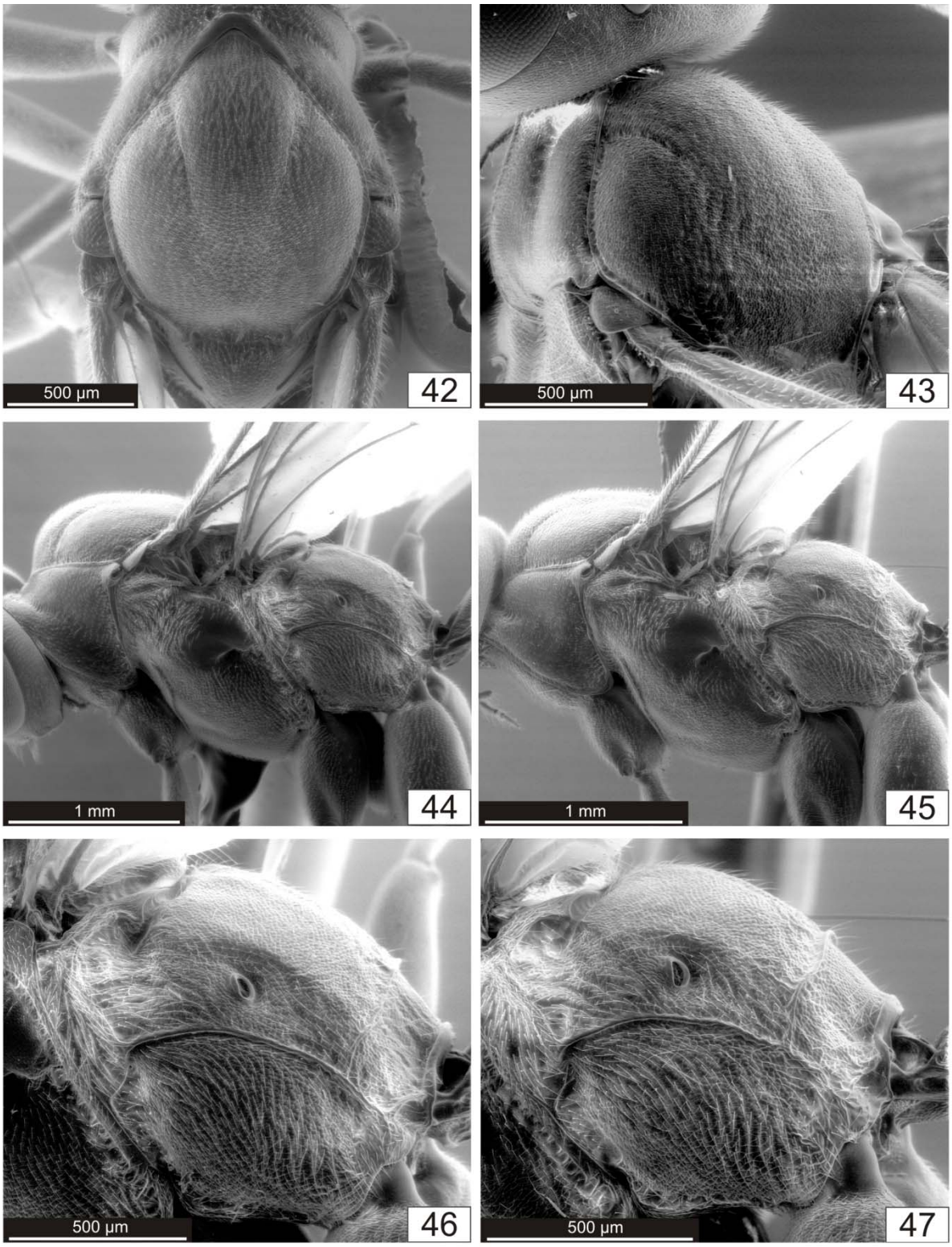
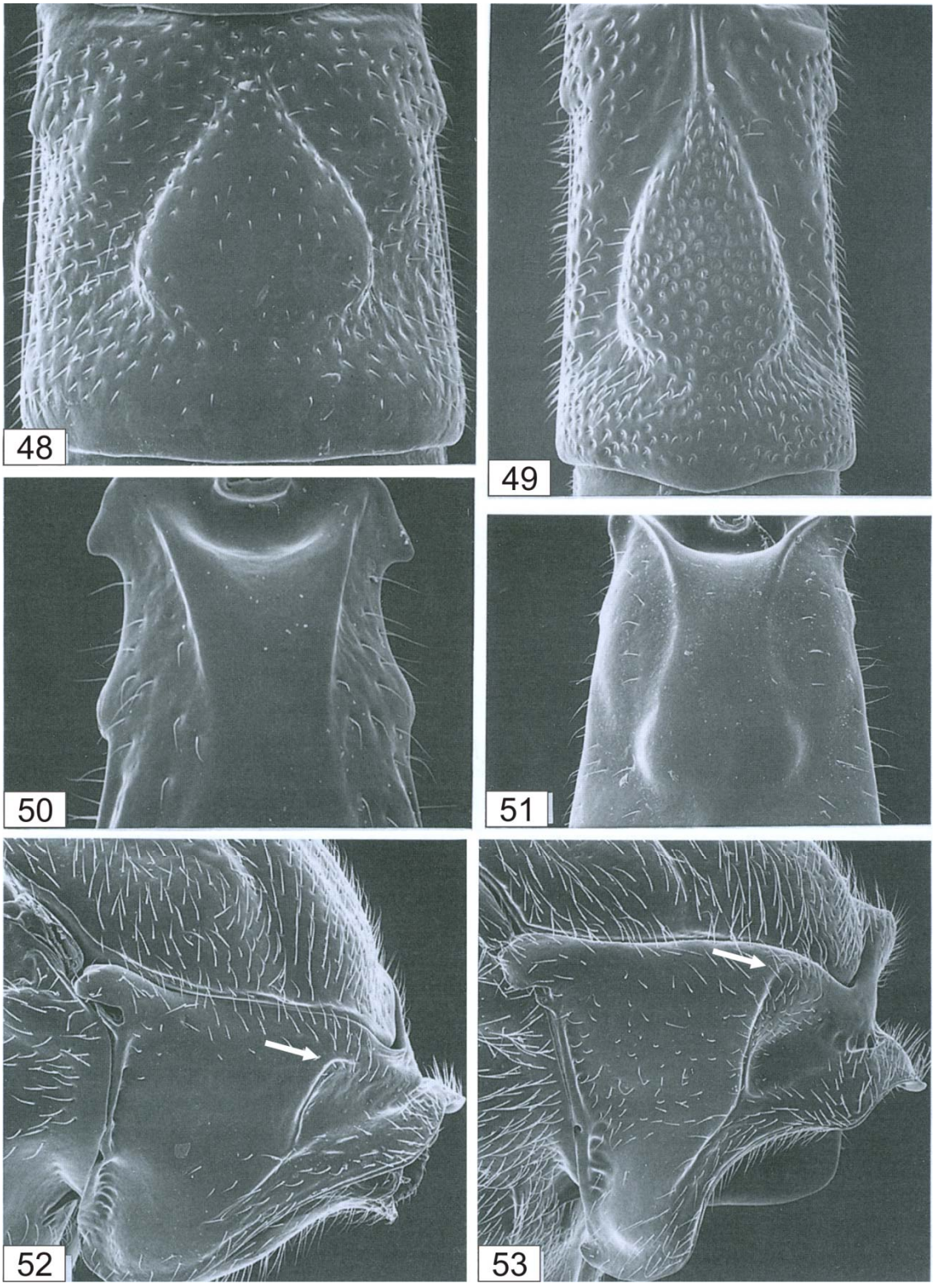


Fig. 41. Taken from GAULD *et al*. (2002) with permission of the authors. *Cecidopimpla ronnai* female habitus.



Figs 42-47. New Genus. Figs 42-43. 42, New genus sp.1, mesoscutum, dorsal view.; 43, New genus sp.2, mesoscutum, dorsolateral view. Figs 44-45. Mesosoma lateral. 44, New genus sp.1; 45, New genus sp.2. Figs 46-47. Metapleuron; 46, New genus sp.1; 47, New genus sp. 2.



Figs 48-53. Taken from GAULD *et al*. (2002) with permission of the authors. Stereoscan photographs of Glyptini. Figs 48-49. Tergite II dorsal; 48, *Glypta* sp; 49, *Zaglyptomorpha* sp. Figs 50-51. Anterior part of tergite I, dorsal; 50, *Sphelodon* sp.; 51, *Glypta* sp. Figs 52-53. Pronotum and mesoscutum, dorsolateral, showing epomia (arrows indicate upper end of it); 52, *Glypta* sp. 53, *Zaglyptomorpha* sp.

4.2.1 New genus of the tribe Atrophini (Figs 42-47)

Diagnosis: This new genus belongs to a small complex of atrophine genera characterized by having a long bulla (or two very close bullae) in 2m-cu near to M, and a weakly broadened submetapleural carina (Figs 46, 47). This group includes the genera *Cordeleboea* Ugalde & Gauld, 2002, *Podeleboea* Ugalde & Gauld, 2002 and *Lissonota* Gravenhorst, 1829. The new genus differs from *Lissonota* mainly in two characteristics: lower part of occipital carina joining hypostomal carina slightly above base of mandible, and mesoscutum with notauli vestigial or absent in *Lissonota*. Lower part of occipital carina joining hypostomal carina distinctly above base of mandible, and mesoscutum with notauli impressed anteriorly in the new genus (Figs 42-45). The new genus distinguishes from *Cordeleboea* in several features: lower part of epicnemial carina strongly sinuous in *Cordeleboea*, and lower part of epicnemial carina rather straight in the new genus (Figs 44, 45); posterior transverse carina of mesosternum usually represented by a distinct central lamella in *Cordeleboea* and posterior transverse carina of mesosternum entirely absent in the new genus; propodeum with lateromedian and sometimes lateral longitudinal carinae weak but discernible in *Cordeleboea*, and propodeum with lateral and lateromedian longitudinal carinae entirely absent in the new genus (Figs 44, 45). From *Podeleboea* the new genus can be separated for the next characters: *Podeleboea* has a lower part joining hypostomal carina slightly above base of mandible; while in the new genus the lower part joins hypostomal carina distinctly above base of mandible.Mesosoma with the epicnemium sloping strongly backwards ventrally in *Podeleboea* sloping slightly backwards ventrally in the new genus (Figs 44, 45). Lower part of epicnemial carina strongly sinuous in *Podeleboea* and rather straight in the new genus (Figs 44, 45).

Description.

Head: Clypeus in profile flared slightly outwards, with margin thickened, apically, abruptly in-turned; clypeus in anterior view, strongly transverse; mandibles barely tapered apically not at all twisted, with upper tooth very slightly longer than the lower; lower face weakly convex, with a median vertical swelling; inner margins of antennal sockets unspecialized; frons flat or very slightly concave, granulate; occipital carina dorsally complete, its lower part joining hypostomal carina distinctly above base of mandible; antenna slender, often white-banded. **Mesosoma:** short to moderately long, with the epicnemium sloping slightly backwards ventrally; epomia absent (Figs 44, 45); mesoscutum with notauli impressed anteriorly (Figs. 42, 43); mesopleuron with epicnemium without a distinct vertical tooth-like lamella near lower corner of pronotum; lower part of epicnemial carina rather straight (Figs 44, 45); posterior transverse carina of mesosternum entirely absent; metapleuron with submetapleural carina narrow, only slightly and evenly broadened anteriorly (Figs 46, 47); metasternum with weak ridges between coxal insertions; propodeum with anterior transverse, lateral and lateromedian longitudinal carinae entirely absent and with posterior transverse and pleural carinae complete (Figs 46, 47); propodeal spiracle slightly oval (Figs 46, 47). Legs with all tarsomeres cylindrical. Fore wing length 4.8–5.6 mm; hind wing length 3.5–4.1 mm. Fore wing with vein 3*rs-m* entirely absent, with no trace of an areolet discernible at all; vein 2*m-cu* with a single fairly long bulla close to *M*; *cu-a* far distal to base of *Rs&M*; hind wing with distal abscissa of *Cu*1, present, joining *cu-a* close to 1*A*.

Metasoma with glymma shallow or vestigial. Ovipositor with a dorsal subapical notch.

4.3 Key to genera of Banchini occurring in Brazil

1. Mandilbles weakly and evenly tapered apically, not twisted, with upper tooth slightly longer and broader than the lower…….....……..***Exetastes***

- Mandibles with apex notably broader than the base and with upper tooth distinctly longer than the lower…….....…….....……..***Neoexestastes***

4.4 Tribe Glyptini

The Glyptini is one the three tribes of Banchinae registered in Brazil, whose members parasitize their host in concealed environments (e.g. leaf rolls and tunnels in plant stems) (Townes, 1970). This tribe is characterized by the possession of oblique grooves on tergites II-IV, comprising twelve genera worldwide and five genera in the Neotropical region: *Glypta* Gravenhorst with species registered in the Neotropics from Mexico, Costa Rica, Uruguay and Argentina, *Levibasis* Townes from Peru, *Sphelodon* Townes from Mexico, Costa Rica, Panama, Venezuela and Brazil, *Teleutaea* Förster, with a single Neotropical species from Mexico, and *Zaglyptomorpha* Viereck, a small genus restricted to the New World.

4.4.1 Key to genera of Glyptini occurring in Brazil

1. First abdominal tergite with prominent basolateral tooth (Fig. 50 - page 29) ..……***Sphelodon***

- First abdominal tergite without basolateral tooth (Fig. 51 - page 29) …….……...2

2. Pronotum with epomia prominent, its upper end reaching almost to dorsal margin of pronotum, distinctly enlarged (Fig. 53 - page 29), in dorsal view forming a strongly raised tubercle.....***Zaglyptomorpha***

- Pronotum with epomia weak to moderately developed, its upper end either weak and removed from margin of pronotum, or closer but not strongly swollen (Fig 52 - page 29), in dorsal view forming a low ridge…….....……..***Glypta***

4.4.2 Two new species of *Zaglyptomorpha* Viereck, 1913 (Hymenoptera: Ichneumonidae) from Brazil.

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Abstract

Two new species of the new world genus *Zaglyptomorpha* Viereck, 1913 are described and illustrated from the Central-West region of Brazil. An identification key to the Brazilian species is provided, including a previously described species, *Z. danunciae* Graf, 1979.

Key Words

Wasps, parasitoid, Ichneumonoidea, Banchinae, Glyptini, Neotropics, South America, identification key.

Introduction

The Banchinae is a large group of ichneumonids, with worldwide distribution which hosts are lepidopterous larvae (Townes, 1970; Gauld *et al*. 2002) comprising around 1540 described species classified in three tribes (the Atrophini, Banchini, and Glyptini) and 50 genera (Yu & Horstmann, 1998; Gauld *et al*. 2002). The Glyptini is a cosmopolitan taxon, whose members parasitize their host in concealed environments (e.g. leaf rolls and tunnels in

plant stems) (Townes, 1970). This tribe is characterized by the possession of oblique grooves on tergites II-IV, comprising twelve genera worldwide and five genera in the Neotropical region: *Glypta* Gravenhorst with species registered in the Neotropics from Mexico, Costa Rica, Uruguay and Argentina, *Levibasis* Townes from Peru, *Sphelodon* Townes from Mexico, Costa Rica, Panama, Venezuela and Brazil, *Teleutaea* Förster, with a single Neotropical species from Mexico, and *Zaglyptomorpha* Viereck, a small genus restricted to the New World characterized by a swollen upper end of the epomia. The great majority of species of the genus *Zaglyptomorpha* is registered from the Neotropic region, where twenty five species are described: twenty species are known from Costa Rica, two from Mexico, *Z. attenuata* Viereck, 1913 from Paraguay and *Z. danunciae* Graf, 1979 from Brazil (Yu & Horstmann, 1998; Gauld *et al.* 2002). The *Zaglyptomorpha* species with broader distribution so far is *Z. albopicta* Cresson, 1874, registered in Costa Rica, Mexico, and also Arizona in United States of America, being the only species of the genus present in the Nearctic Region (Yu & Horstmann, 1998). The only registered hosts of *Zaglyptomorpha* species belong to the Lepidopteran families Crambidae and Tortricidae (Gauld *et al*. 2002).

Material and methods

The specimens of the two new species of the genus *Zaglyptomorpha* described in this paper are deposited at the DCBU Collection (Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos, São Carlos, Brasil) and they were captured at the Reserva Ecológica do IBGE (Instituto Brasileiro de Geografia e Estatística)- RECOR, a Brazilian Savanna formation 33 km southward Brasília at BR- 251 in the next GPS coordinates: 15° 56’ 41”S e 47°53’07”W GRW. The nomenclatural treatment, morphological terminology and taxonomic characters used here follow Gauld (1991) and Gauld *et al*. 2002. Type material from other described species of the genus was not available to us, but species

treated in this study were compared with those included in Gauld *et al*. 2002 or through confrontation with the original descriptions. Cresson (1874), Viereck (1913), Morley (1914) and Graf (1979) provided comprehensive information; data from those works have been used here to produce the key for the Brazilian *Zaglyptomorpha* species.

Results

Key to Brazilian species of *Zaglyptomorpha*

1. Frons flat, simplified, without either a projection or a carina-like ridge above each antennal socket (Fig. 2); propodeum without longitudinal carinae (Fig. 5).....……..***Zaglyptomorpha.* sp. nov. 11**

- Frons with either a strong angular projection or a simple arched carina above each antennal socket (Figs 9, 10); propodeum with at least part or a vestige of a longitudinal carina (either the latero-median or the lateral) (Fig.13).....….....…….2

2. Frons with only a low, simple and arched carina above each antennal socket (Figs 9,10); propodeum with latero-longitudinal carina absent (Fig. 13).……***Zaglyptomorpha.* sp. nov. 12**

-Frons above each antennal socket with a greatly raised carina-like ridge, that extends upwards and outwards forming a cornuted process; propodeum with latero-longitudinal carina present……***Zaglyptomorpha danunciae*** Graf, 1979

Zaglyptomorpha sp. nov. 11

(Figs 1-7)

Diagnosis. This species is distinguished from most of the described species (including the sympatric species *Z. danunciae*) by the simplified frons (Fig. 2), as in *Z. minuta*

Godoy & Gauld, 2002, but this Costa Rican species has a propodeum with carinae more or less complete, delineating an enclosed area superomedian; the new species lack longitudinal carinae on the propodeum, thus not possessing that area (Fig. 5). This same character makes the Brazilian species different from *Z. attenuata* described from Paraguay. It differs from *Z. decolorata* Cresson 1874 at least in colour (the original description does not have any morphological information): base and apex of first tergite black, legs whitish in *Z. decolorata*; first tergite orange and yellow legs in *Z.* sp. nov. 11 (Fig. 1). Besides the already mentioned characteristic simple frons (Fig. 2), *Z.* sp. nov. 11 can be easily separated from *Z.* sp. nov. 12 (Fig. 8) because in the propodeum the former does not present any longitudinal carina (Fig. 5), and shows conspicuous spines on the hind tibia (Fig. 7).

Description. Holotype, female (Fig. 1).

Head: Clypeus in profile almost flat, in anterior view 1.2 times as broad as long, clypeal margin truncate; malar space 0.9 times as long as basal mandibular width; lower face moderately convex centrally, smooth; frons flat, simplified, smooth and impuctate, without either a projection or a carina-like ridge above each antennal socket (Fig. 2); occipital carina entirely absent dorsally, only present ventral and laterally; lower part of occipital carina weak but complete, not reaching hypostomal carina, at the base of mandible. Antenna with 35 flagellomeres, first flagellomere 0.8 times as long as the second and third flagellomeres combined.

Mesosoma: Pronotum with upper part of epomia present, but weak and somewhat sinuous (Fig. 3), with lateral margins forming two truncate lobes in dorsal view (Fig. 4); mesoscutum smooth and polished, with extremely fine setiferous punctures; notauli absent; scutellum and dorsellum smooth with some very inconspicuous setae; scutellum in lateral view, convex, with posterior end, in dorsal view, weakly convex; mesopleuron smooth with some sparse and

inconspicuous setae; epicnemial carina weak distally, evanescent dorsally, just reaching to about the level of lower corner of pronotum laterally, ventrally simplified; sternal part of mesothorax 1.3 times as long as the mid coxa; metapleuron smooth, submetapleural carina with its ventral longitudinal side 2.1 times as long as either of the transverse margins; pleural carina absent; propodeum (Fig. 5) coarsely and sparsely punctuated, with some setae, posterior transverse carina complete and strong, anterior transverse carina complete but weak, lateral and latero-median longitudinal carinae absent (Fig. 5). Fore tibia with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia with spurs more or less equal in length, the longer 1.1 times the length of the shorter; hind leg with first tarsomere 1.4 times as long as second and third tarsomeres combined; fore, mid and specially hind tibiae on the outer side with dark brown conspicuous setae similar to spines, which start on the distal part of the femur, and end on the first tarsomere (Fig. 7). Fore wing length 4.6 mm; hind wing length 3.6 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.0 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 6) with first tergite moderately slender, about 1.4 times as long as posteriorly broad, coarsely and sparsely punctuated, with latero-median longitudinal carina short, posteriorly evanescent, reaching 0.3 of way along, latero-longitudinal carina strong and complete, without any vestige of a central carina (Fig. 5); first tergite, in lateral view with spiracle positioned anterior to centre, about 0.4 of way along; second tergite 1.0 times as long as posteriorly broad, uniform closely and coarsely punctuated, with oblique grooves strongly impressed, convergent anteriorly and without a distinct median longitudinal carina-like ridge (Fig. 6); third tergite similar to second tergite (Fig. 6); fourth tergite with grooves weaker (Fig. 6); fifth tergite without any vestige of a triangular area (Fig. 6); ovipositor of moderate length, 2.2 times as long as hind tibia.

Colour. Head mostly shinny black, somewhat ferruginous toward gena, pale yellow clypeus, labrum, mandibles, labial and mandibular palps, gena between margin of eye and mandibular base, grayish brown eyes, brown ocellus; brown antenna, yellow distal margin of scape, and pedicel. Mesosoma mostly orange with yellow stripes on dorsal and ventral margin of pronotum, mesopleuron, tegula, surrounding area of wing base, and ventral margin of metapleuron. Pronotum, in dorsal view with a yellow basal collar. A mostly yellow scutellum, a yellow dorsellum, propodeum with a dark brownish ferruginous spot on the posterior margin. Metasoma with tergites uniform orange. Sterna mostly pale yellow with brownish spots on second to fifth sternae, sixth sternites+ brown. Pale yellow fore legs. Mid legs mostly pale yellow with a black femur base, a brown ring from 0.3 to 0.4 of way along, and another from 0.7 of way along to the distal apex, yellow tibial spur, first tarsomere with yellow basal two-thirds, distal rest brown; the other tarsomeres brown. Hind legs with coxa pale yellow with a round dark brown spot on outer side, yellow trochanter with a basal dark brown spot. Trochantellus with a brown ferruginous distal spot, femur with brown spots on the base, on the middle (on outer face) and on the distal apex. Tibia with a brown spot from 0.2 to 0.4 of way along and other from 0.8 of way along to the distal apex. A brownish tibial spur; first and second tarsomere with middle basal or so yellow, the distal remainder brownish. Third to fifth tarsomeres brown. Ovipositor orange, ovipositor sheaths dark brownish. Wings infumate. Pterostigma dark brown.

Etymology. The name of this species refers to its characteristic hind tibia with spines (Fig. 7). **Material examined.** HOLOTYPE: Female, Brasil: Brasilia, Reserva Ecológica do IBGE (Instituto Brasileiro de Geografia e Estatística)- RECOR, Km 0 BR 251-DF 15° 56’ 41”S e 47°53’07”W GRW, Malaise trap 21-25/IX/1979 (DCBU).

Zaglyptomorpha sp. nov. 12

(Fig 8-15)

Diagnosis. This new species is relatively similar in its frons characteristics (Figs. 9,10) to the parapatric species *Z. albopicta, Z. ventura* Godoy & Gauld, 2002, *Z. lorraineae* Godoy & Gauld, 2002 and *Z. niloi* Godoy & Gauld, 2002. However, the raised triangular area of second tergite is smooth in the first three described species, being uniform closely punctuated in *Z.* sp. nov. 12 the (Fig. 14). *Z. lorraine* differs from *Z.* sp. nov. 12 in pattern colour and number of flagellomeres. Mesosoma black and 49 flagellomeres in *Z. lorraine*, mesosoma orange (Figs 11-13) and 45 flagellomeres in *Z.* sp. nov. 12. It differs from *Z. decolorata* and *Z. attenuata* at least in the colour pattern. The frons, with a simple carina above each antennal socket (Figs. 9,10), distinguishes it from *Z. danunciae*, *Z. longula* Cresson 1874, which forms a cornuted process, and from *Z.* sp. nov. 11, whose frons is simple, without even a carina (Fig. 2).

Description. Holotype, female (Fig. 8).

Head: Clypeus, in profile, weakly convex, in anterior view 1.3 times as broad as long, clypeal margin convex; malar space 0.8 times as long as basal mandibular width; lower face moderately convex centrally, sparsely and coarsely punctuated and pubescent; frons with only a low and simple arcuate carina above each antennal socket (Figs 9, 10); occipital carina dorsally, centrally interrupted, lower part of occipital carina strong. Antenna with 45 flagellomeres, first flagellomere 1.0 times as long as second and third flagellomeres combined.

Mesosoma: Pronotum with upper part of epomia strong and straight (Fig. 11), in dorsal view forming two swelling lobes (Fig. 12); mesoscutum smooth and polished, with

extremely fine setiferous punctures; notauli present until 0.4 of way along; scutellum and dorsellum smooth and polished with some few, fine and long setae; scutellum in lateral view, convex, with posterior end, in dorsal view, weakly convex; mesopleuron smooth, pretty pubescent (with long and fine setae); epicnemial carina present, laterally exceeding the level of lower corner of pronotum, ventrally simple; sternal part of mesothorax 1.9 times as long as the mid coxa; metapleuron smooth and somewhat pubescent with submetapleural carina with its ventral longitudinal side 1.7 times as long as either of the transverse margins; pleural carina weak but present; propodeum (Fig. 13) smooth with some sparse setae, with latero-median longitudinal carina weak but present between the anterior and the posterior transverse carinae, delineating an area superomedian; latero-longitudinal carina absent (Fig. 13). Fore tibia with spur normally developed, 2.9 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.1 times the length of the shorter; hind leg with first tarsomere 1.3 times as long as second and third tarsomeres combined; hind tibia simple, without conspicuous setae or spines (Fig. 15). Fore wing length 6.8 mm; hind wing length 5.3 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.7 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig.14) with first tergite moderately slender, about 1.1 times as long as posteriorly broad, rather uniform punctuated from the middle to the posterior margin, with latero-median longitudinal carina reaching half the length of tergite (0.5 of way along), latero-longitudinal carina absent, and with a vestige of a central carina on the posterior margin (Fig. 14); first tergite , in lateral view with spiracle positioned anterior to centre, about 0.3 of way along; second tergite 0.9 times as long as posteriorly broad, uniform closely punctuated, with oblique grooves strongly impressed, convergent anteriorly, and with a disctinct median longitudinal carina-like ridge (Fig.14); third and fourth tergites similar to second tergite, but

without a median longitudinal carina-like ridge (Fig.14); fifth tergite with vestiges of oblique grooves (Fig.14); ovipositor of moderate length, 2.1 times as long as hind tibia.

Colour. Head predominantly black, with brownish-yellow clypeus, labrum, mandibles (except for the apex which is black), labial and maxilar palps, genal area abutting mandibular base, grayish brown eyes; brown antenna (the more basal flagellomeres darker), scape, pedicel (dorsally darker) and ocelli. Orange mesosoma with some yellow spots at the dorsal margin of the pronotum, aside from the epomia, tegula, subalar area, scutellum and dorsellum. Metasoma mainly reddish ferruginous with yellow transversal stripes at posterior margins of first to fourth tergites, brown reddish fifth tergite with dark orange posterior margin, orange reddish ferruginous sixth and seventh tergites; pale yellow sternites. Orange yellowish fore and mid tibiae, hind legs with yellow coxa with a ferruginous spot on outer side, trochanter mostly reddish ferruginous with a yellow distal margin, dorsally, yellow trochantellus, reddish ferruginous femur with distal apex yellow, tibia mostly yellow with brown ferruginous spots basally and distally, brown hind tibial spurs. First tarsomere with proximal half yellow, the rest brownish ferruginous, second tarsomere with yellow base, ferruginous the rest proximal, brownish ferruginous third to fifth tarsomeres; black brownish ovipositor sheaths, orange ovipositor brownish; wings infumate, without any spot; pterostigma dark brown.

Etymology. This species is named in honour of our colleague Luciana Bueno dos Reis Fernandes for improving our photos.

Material examined. HOLOTYPE: Female, Brasil: Brasília, Reserva Ecológica do IBGE (Instituto Brasileiro de Geografia e Estatística)- RECOR, Km 0 BR 251-DF 15° 56’ 41”S e 47°53’07”W GRW, Malaise trap 2-9/II/1980 (DCBU).

Acknowledgments. The authors acknowledge the financial assistance granted by CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico), FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo, Programa Biota), and HYMPAR/SUDESTE (INCT – Instituto Nacional dos Hymenoptera Parasitóides da Região Sudeste Brasileira). Also, special thanks to Luciana Bueno dos Reis Fernandes for editing the photos.

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FIGURES

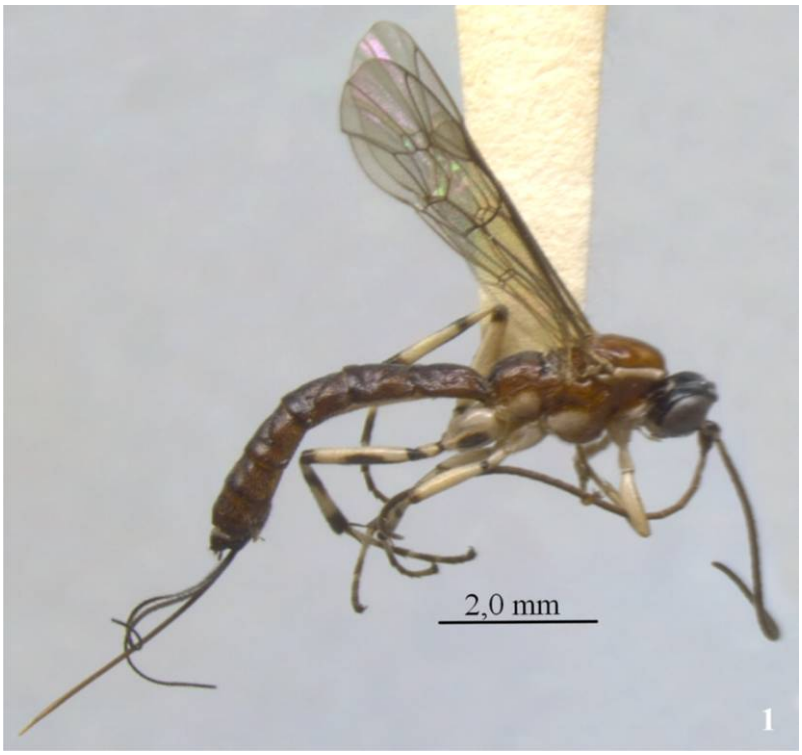


FIGURE 1. Habitus of *Zaglyptomorpha* sp. nov. 11 (Holotype female).

FIGURES 2-7. *Zaglyptomorpha* sp. nov. 11 (female). 2, head, dorsal view; 3, head and mesosoma, lateral; 4, pronoto and mesoscutum, dorsal; 5, propodeum and tergite I of metasoma, dorsal; 6, metasoma, dorsal; 7, hind femur and tibia.

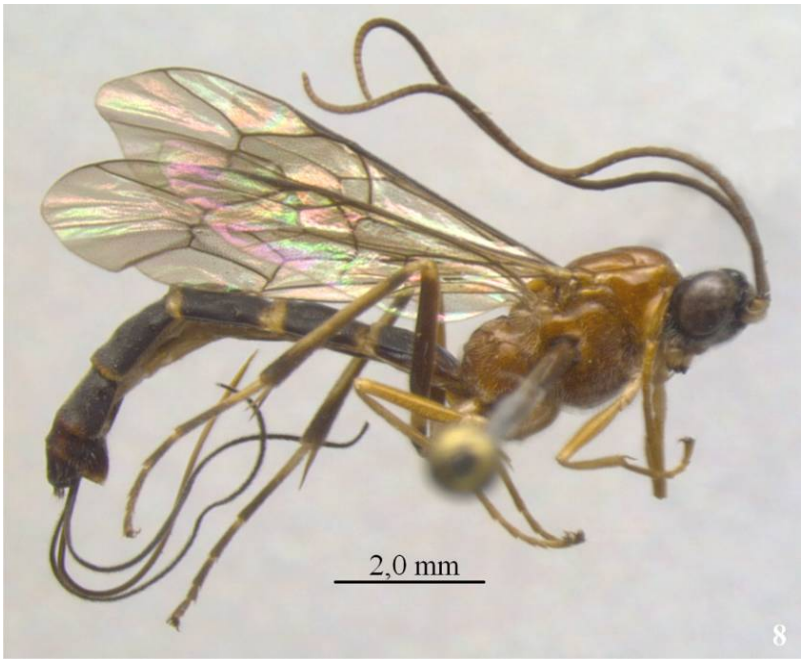
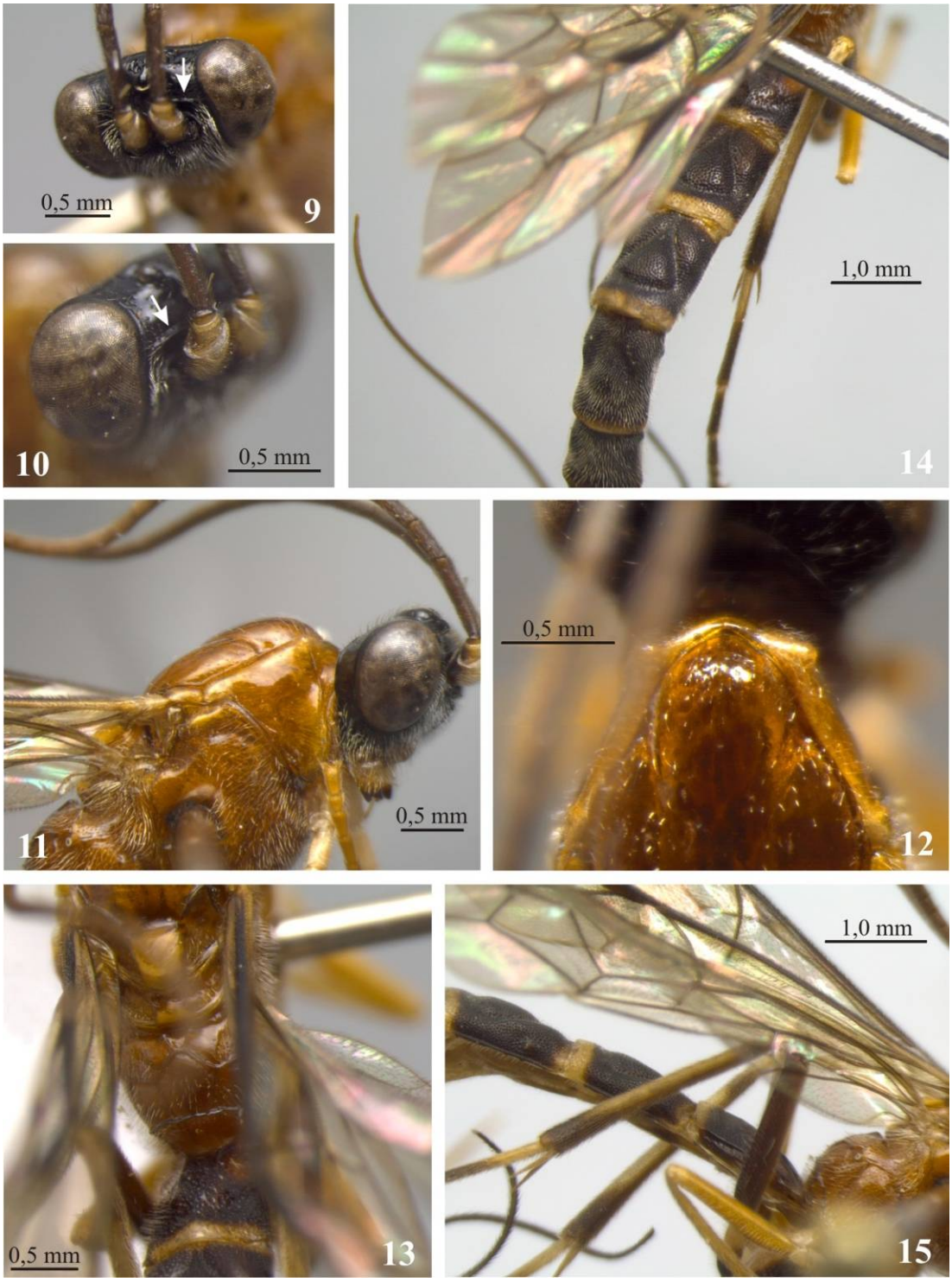


FIGURE 8. Habitus of *Zaglyptomorpha* sp. nov. 12 (Holotype female).



FIGURES 9-15. *Zaglyptomorpha* sp. nov. 12 (female). FIGURES 9-10. Head, arrows indicate carina in the frons; 11, head and part of mesosoma, lateral; 12, pronoto and part of mesoscutum, dorsal; 13, propodeum and tergite I of metasoma, dorsal; 14, metasoma, dorsal; 15, hind tibia.

4.4.3 Ten New species of *Zaglyptomorpha* (Hymenoptera: Ichneumonidae: Banchinae) from Brazil.

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Abstract

Ten new species of the new world genus *Zaglyptomorpha* are described and illustrated from several regions of Brazil. An identification key to the Brazilian species is provided.

Key Words

Parasitoid, Ichneumonoidea, Glyptini, Neotropics, South America.

Introduction

Zaglyptomorpha Viereck, 1913 is a small genus of the Banchinae tribe Glyptini restricted to the New World characterized by a swollen upper end of the epomia. The great majority of species of the genus *Zaglyptomorpha* is registered from the Neotropic region, where twenty five species are described: twenty species are known from Costa Rica, two from Mexico, *Z. attenuata* Viereck, 1913 from Paraguay and *Z. danunciae* Graf, 1979 from Brazil (YU & HORSTMANN, 1998; GAULD *et al.* 2002; YU *et al*., 2005). The *Zaglyptomorpha* species with broader distribution so far is *Z. albopicta* Cresson, 1874, registered in Costa Rica, México, and also Arizona in United States of America, being the only species of the genus present in the Nearctic Region (YU & HORSTMANN, 1998; YU *et al*., 2005). The only registered hosts of *Zaglyptomorpha* species belong to the Lepidopteran families

Crambidae and Tortricidae (GAULD *et al*. 2002). Ten new species of *Zaglyptomorpha* are keyed and described from Brazil in this paper.

Material and methods

The material included in this revision was obtained in the main entomological collections of the Southeast and South of Brazil: Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos, São Carlos, SP, Brasil (DCBU), Universidade Federal de Paraná (UFPR), Museu de Zoologia Universidade de São Paulo (MZUSP), Universidade Federal de Espírito Santo (UFES), Universidade Federal de Rio de Janeiro (UFRJ), Coleção Entomológica Instituto Oswaldo Cruz (CEIOC), and material from the Project Biota Noroeste UNESP São José de Rio Preto (UNESP-SJRP). Type material was not available to us, but species treated in this study were identified using the keys of GAULD *et al*. (2002) or through comparison with the original descriptions.

The nomenclatural treatment, morphological terminology and taxonomic characters used here follow GAULD (1991) and GAULD *et al*. (2002). Type material from other described species of the genus was not available to us, but species treated in this study were compared with those included in GAULD *et al*. (2002) or through confrontation with the original descriptions. CRESSON (1874), VIERECK (1913), MORLEY (1914) and GRAF (1979) provided comprehensive information; data from those works have been used here to produce the key for the Brazilian *Zaglyptomorpha* species.

RESULTS

Key to Brazilian species of *Zaglyptomorpha*

1. Frons flat, simple…….....…….***Zaglyptomorpha* sp. nov. 11**

- Frons with either a strong angular projection or a simple arched carina above each antennal socket (Figs 11-20)…….....……..2

2. Frons with only a low, simple and arched carina above each antennal socket (Figs 11-13, 16, 18-20)…….....3

- Frons with a strongly raised carina-like ridge above each antennal socket (Figs 14, 15, 17) …….....10

3. Propodeum with only a strong posterior transverse carina present (Fig. 43)….....… …….....***Zaglyptomorpha* sp. nov. 3**

- Propodeum with at least posterior transverse and anterior transverse carinae present (Fig. 41, 42, 44-50).…….....……..4

4. Propodeum without a delineated area superomedia (Figs 41, 42, 44, 46, 48, 49)……...…..5

- Propodeum with a delineated area superomedia (Figs. 44, 45, 47, 50)…….....……..9

5. Tergite II with a distinct median long carina (Figs 54, 55, 56, 57, 59).....6

- Tergite II without a distinct median long carina-like ridge (Figs 51, 52, 53, 60)…….....7

6. Tergites II-IV of metasoma mostly smooth except for a few insconspicuous sparse punctures (Fig. 56). Antenna with 42 flagellomeres.……..…….***Zaglyptomorpha* sp. nov. 6**

- Tergites II-IV of metasoma uniformly punctuate, the raised triangular part with similar extensively fine close punctures to anterolateral part (Fig. 59). Antenna with 44 flagellomeres

…….....……...***Zaglyptomorpha* sp. nov. 9**

7. Tergite II uniformly punctuate (Fig. 52)…….....…….***Zaglyptomorpha* sp. nov. 2**

- Tergite II rather smooth (Figs 51, 58)…….....……..8

8. Propodeum without lateral and lateromedian longitudinal carinae (Fig. 41) …….....***Zaglyptomorpha* sp. nov. 1**

- Propodeum with lateral and lateromedian longitudinal carinae present anteriorly (until the level of anterior transverse carina) (Fig. 48).……....***Zaglyptomorpha* sp. nov. 8**

9. Tergite II without a distinct median longitudinal carina-like ridge (Figs 51, 52, 53, 60)……...……....***Zaglyptomorpha* sp. nov. 10**

- Tergite II with a distinct median longitudinal carina-like ridge (Figs 54, 55, 56, 57, 59) …… …….....…***Zaglyptomorpha* sp. nov. 12**

10. Area superomedia with an incomplete median longitudinal carina (Fig. 44)…..……...11

- Area superomedia without a median longitudinal carina (Fig. 47)……..……..12

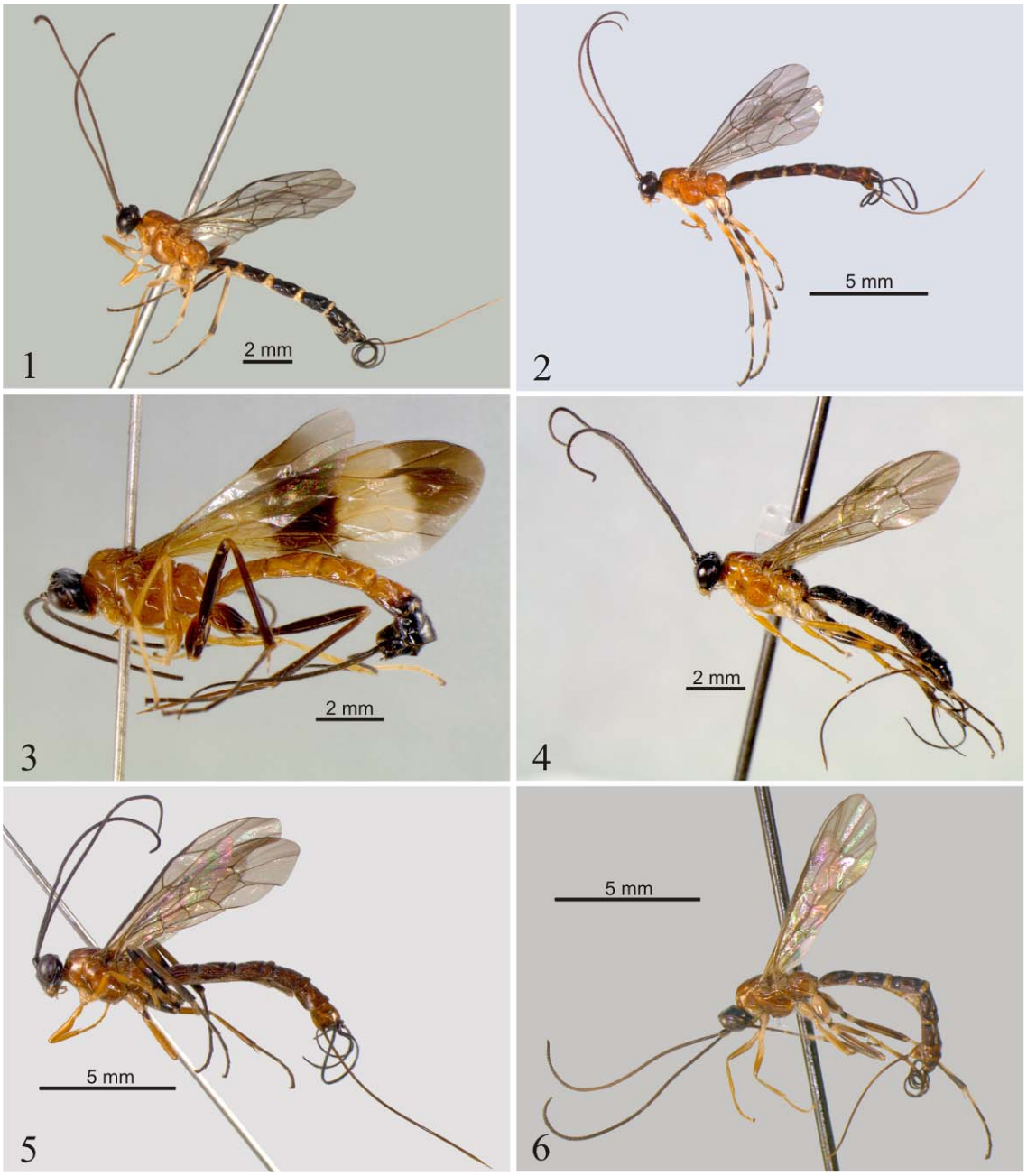
11. Propodeum with lateral longitudinal carina complete…….....…… .....***Zaglyptomorpha danunciae*** Graf, 1979

- Propodeum with lateral longitudinal carina interrupted between anterior and posterior transverse carina (Fig. 44)…….....……...***Zaglyptomorpha* sp. nov. 4**

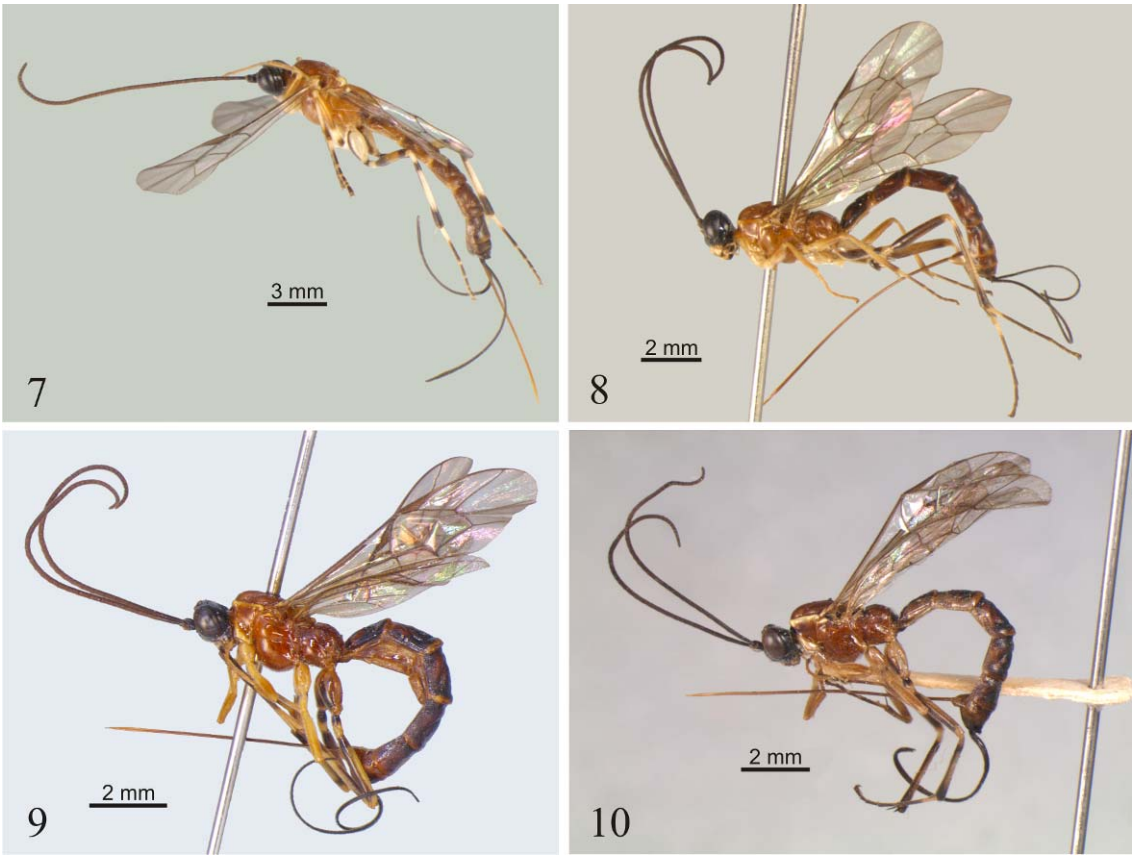
12. Tergite II with lateral area with some sparse punctures (Fig. 55)..... ……...……...***Zaglyptomorpha* sp. nov. 5**

- Tergite II finely, closely and uniformly punctuate all over (Fig. 57)…....…… …….....…….***Zaglyptomorpha* sp. nov. 7**

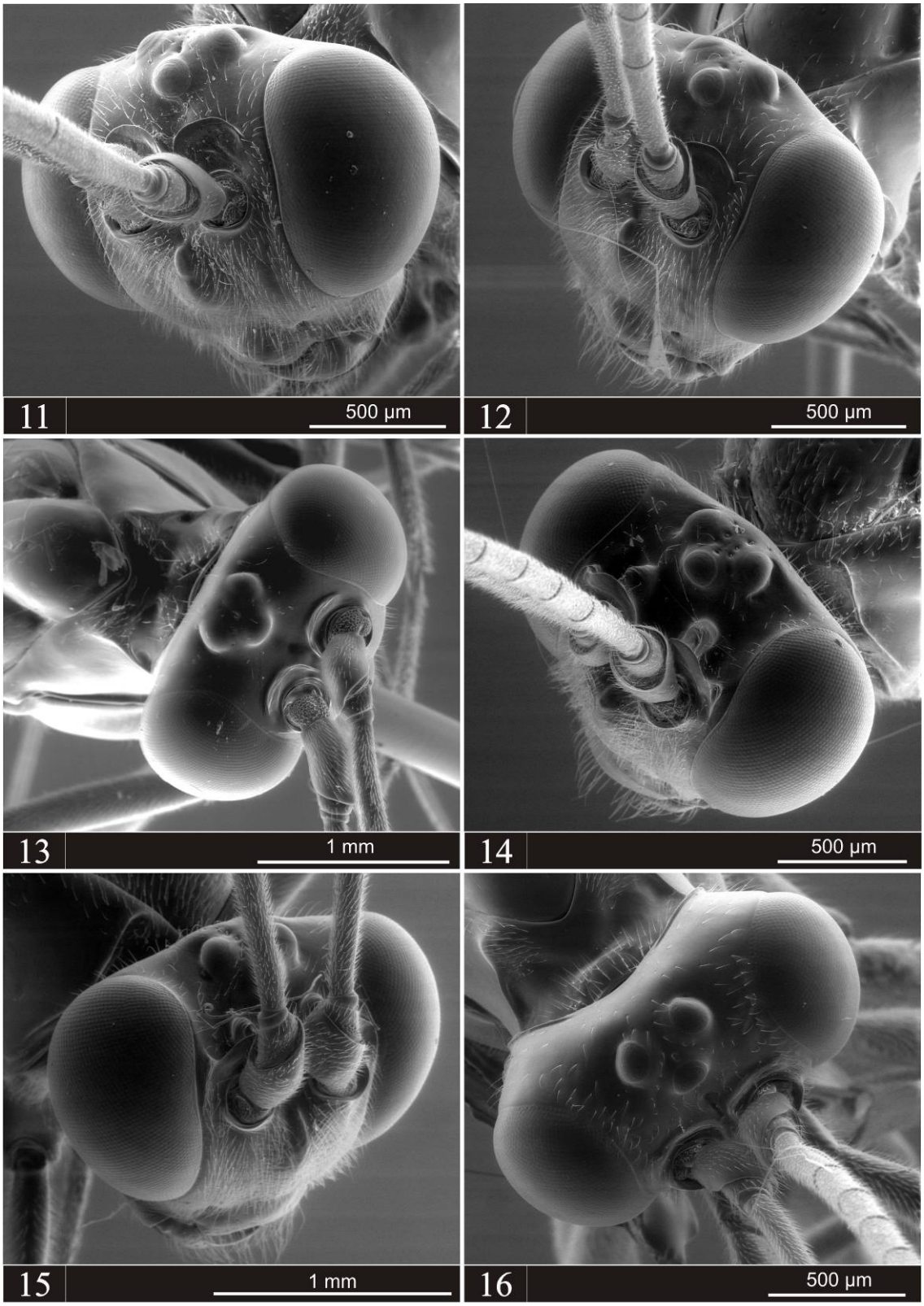
Figures



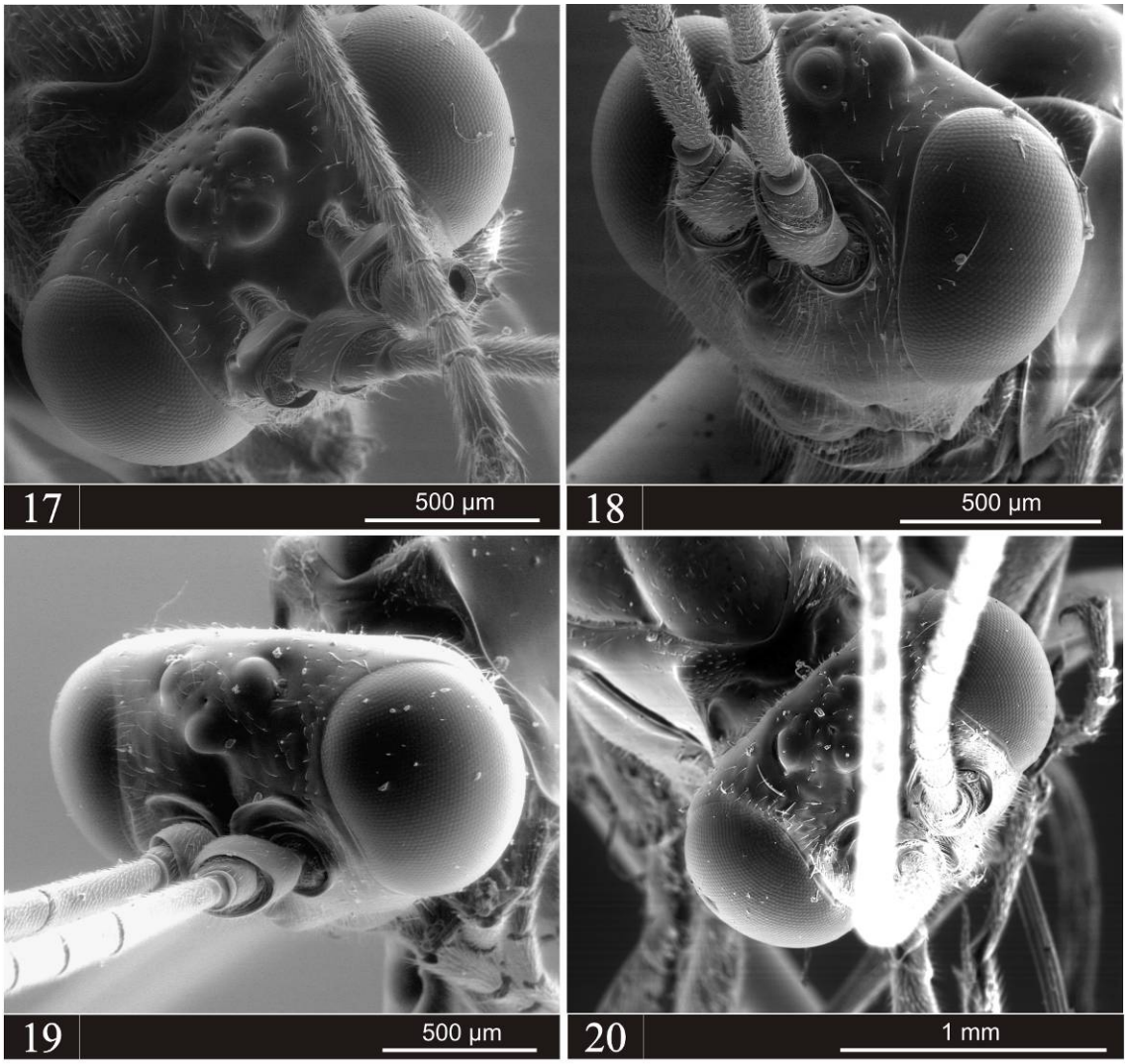
Figures 1-6. *Zaglyptomorpha* spp., habitus; 1, *Zaglyptomorpha* sp. nov. 1; 2, *Z.* sp. nov. 2 ; 3, *Z.* sp. nov. 3; 4, *Z.* sp. nov. 4; 5, *Z.* sp. nov. 5; 6, Z. sp. nov. 6.



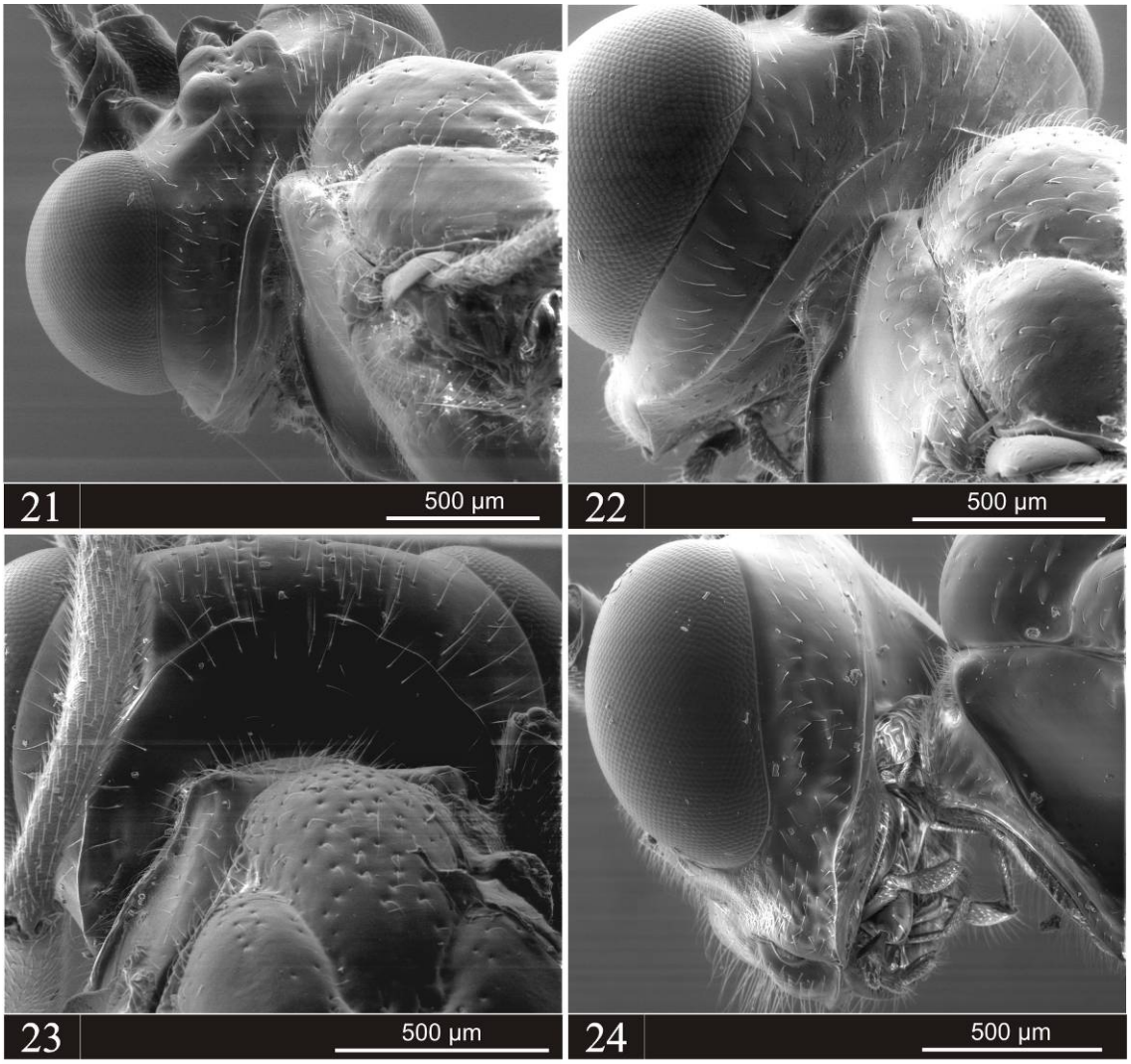
Figures 7-10. *Zaglyptomorpha* spp., habitus; 7, *Z.* sp. nov. 7; 8, *Z.* sp. nov. 8. 9, *Z.* sp. nov. 9; 10, *Z.* sp. nov. 10.



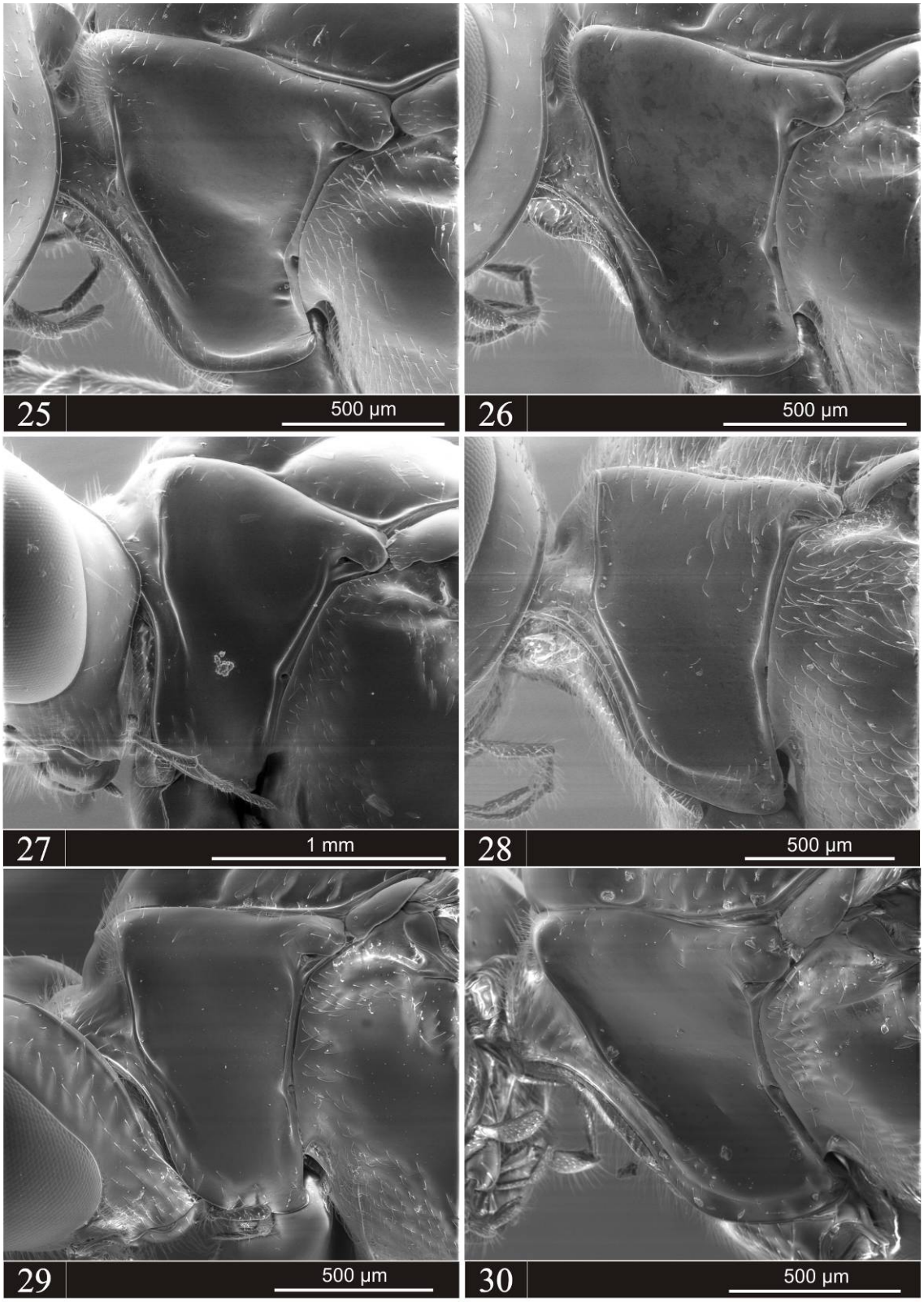
Figures 11-16. Stereoscan photographs of *Zaglyptomorpha* spp., frons; 11, *Zaglyptomorpha* sp. nov. 1; 12, *Z.* sp. nov. 2; 13, *Z.* sp. nov. 3; 14, *Z.* sp. nov. 4; 15, *Z.* sp. nov. 5; 16, Z. sp. nov. 6.



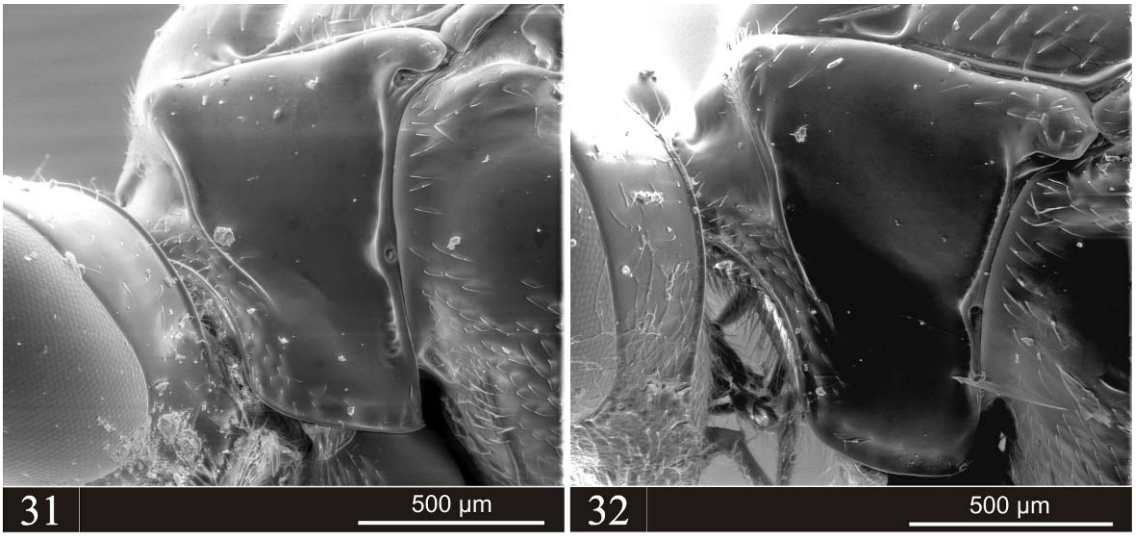
Figures 17-20. Stereoscan photographs of *Zaglyptomorpha* spp., frons; 17, *Z.* sp. nov. 7; 18, *Z.* sp. nov. 8; 19, *Z.* sp. nov. 9; 20, *Z.* sp. nov. 10.



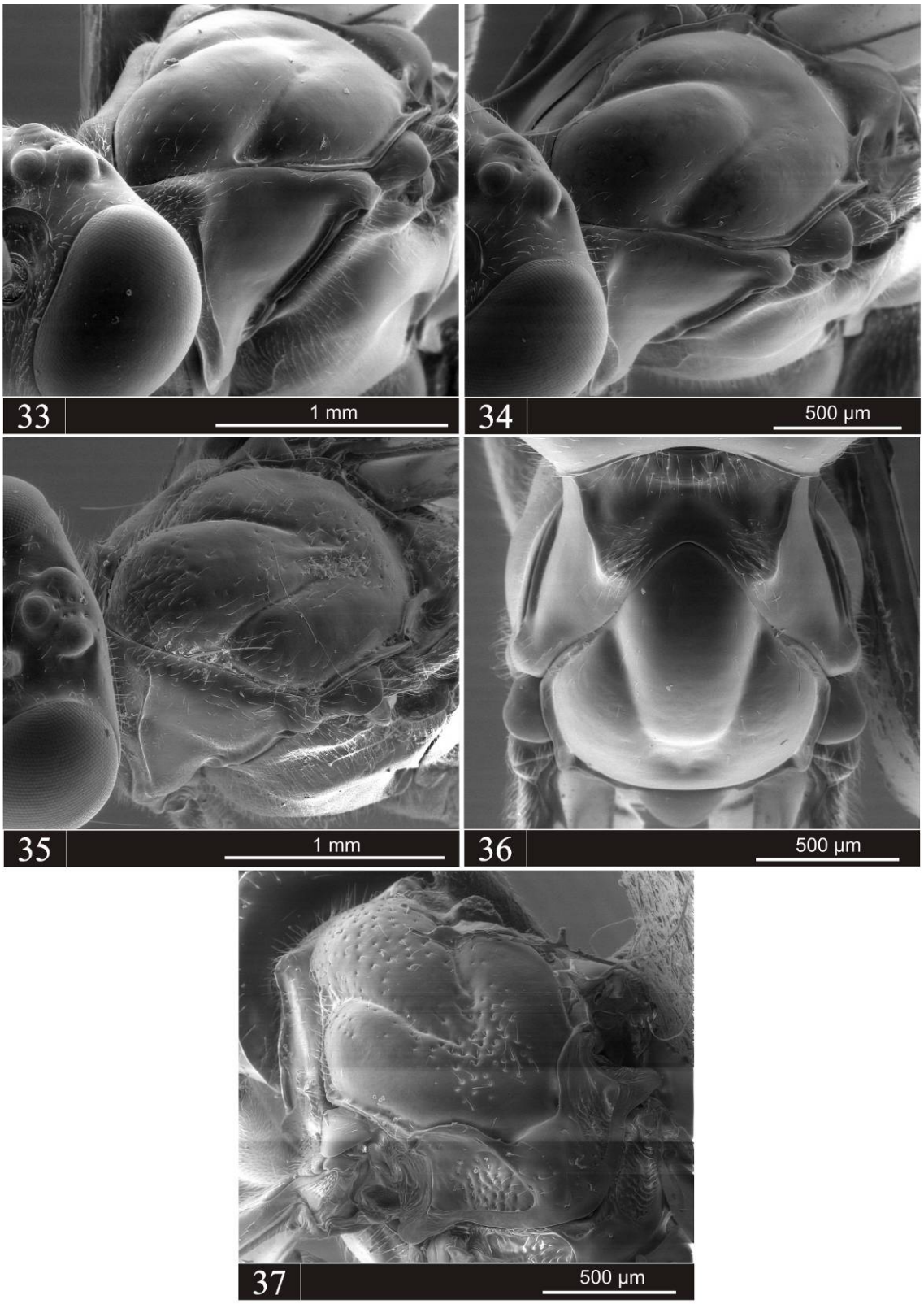
Figures 21-24. Stereoscan photographs of *Zaglyptomorpha* spp., head, posterior view, showing occipital carina; 21, *Z.* sp. nov. 4; 22, *Z.* sp. nov. 5; 23, *Z.* sp. nov. 7; 24, *Z.* sp. nov. 8.



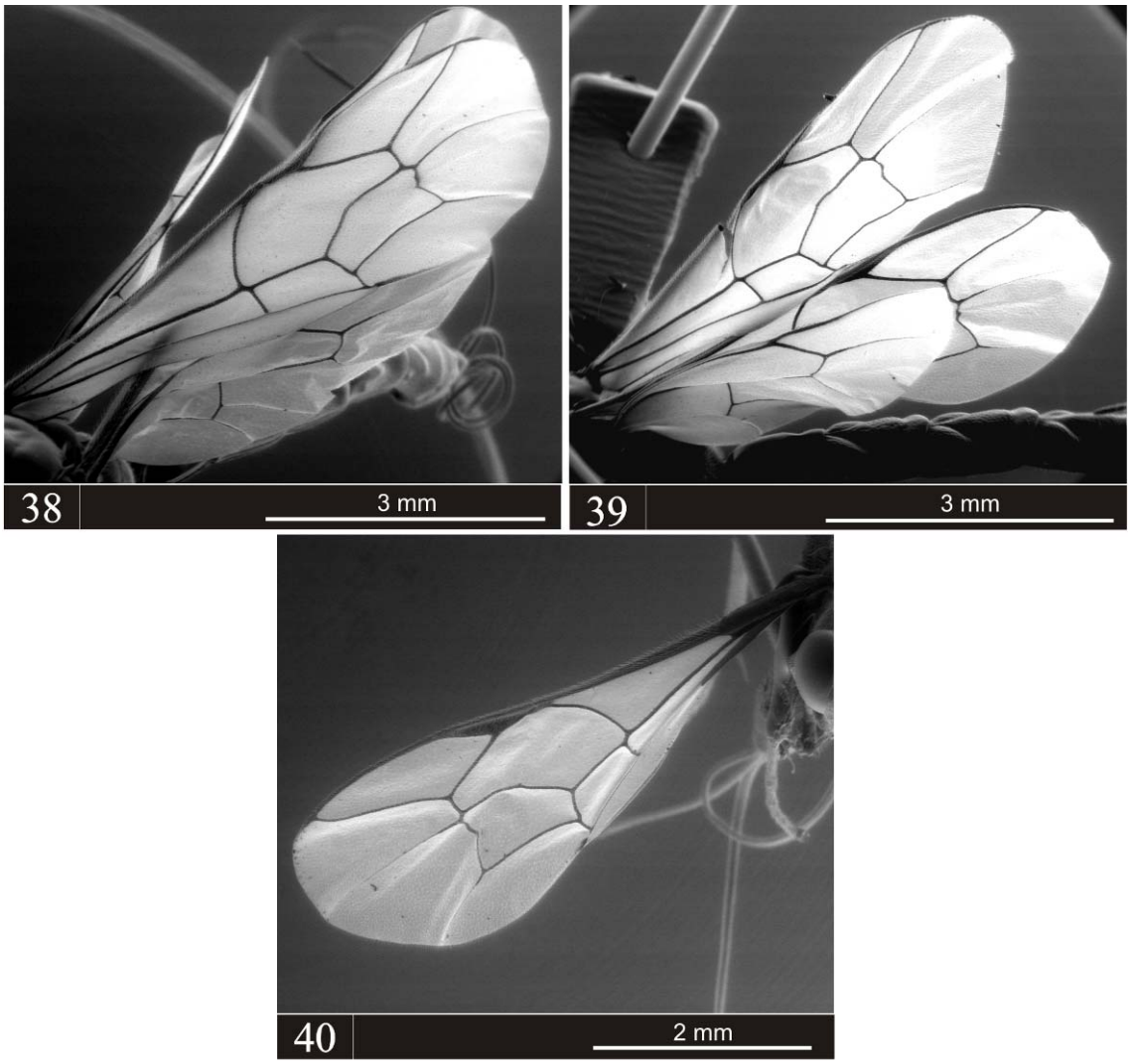
Figures 25-30. Stereoscan photographs of *Zaglyptomorpha* spp., pronotum, lateral, showing epomia; 25, *Z.* sp. nov. 1; 26, *Z.* sp. nov. 2; 27, *Z.* sp. nov. 3; 28, *Z.* sp. nov. 5; 29, *Z.* sp. nov. 6; 30, *Z.* sp. nov. 8.



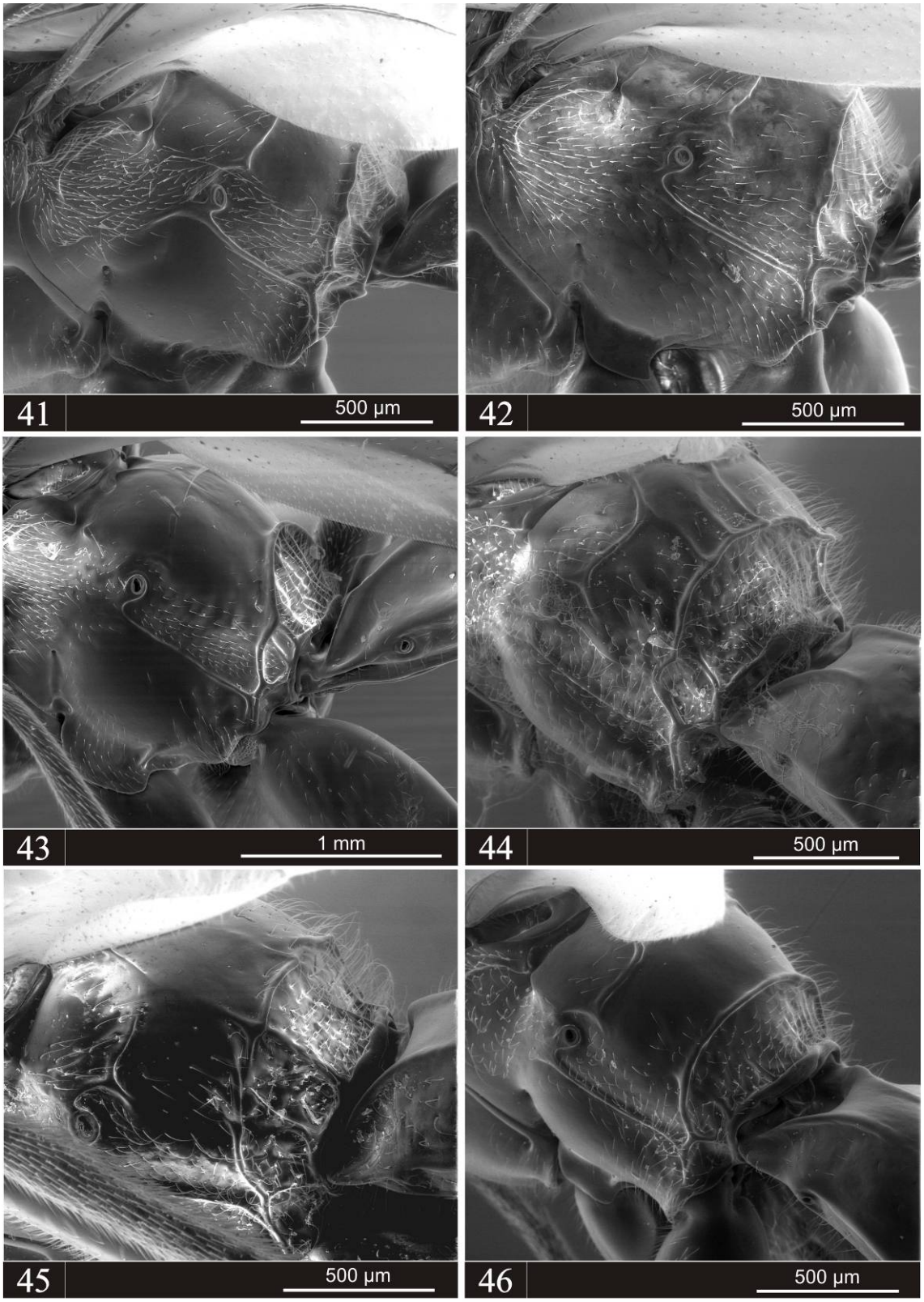
Figures 31-32. Stereoscan photographs of *Zaglyptomorpha* spp., pronotum, lateral, showing epomia; 31, *Z.* sp. nov. 9; 32, *Z.* sp. nov. 10.



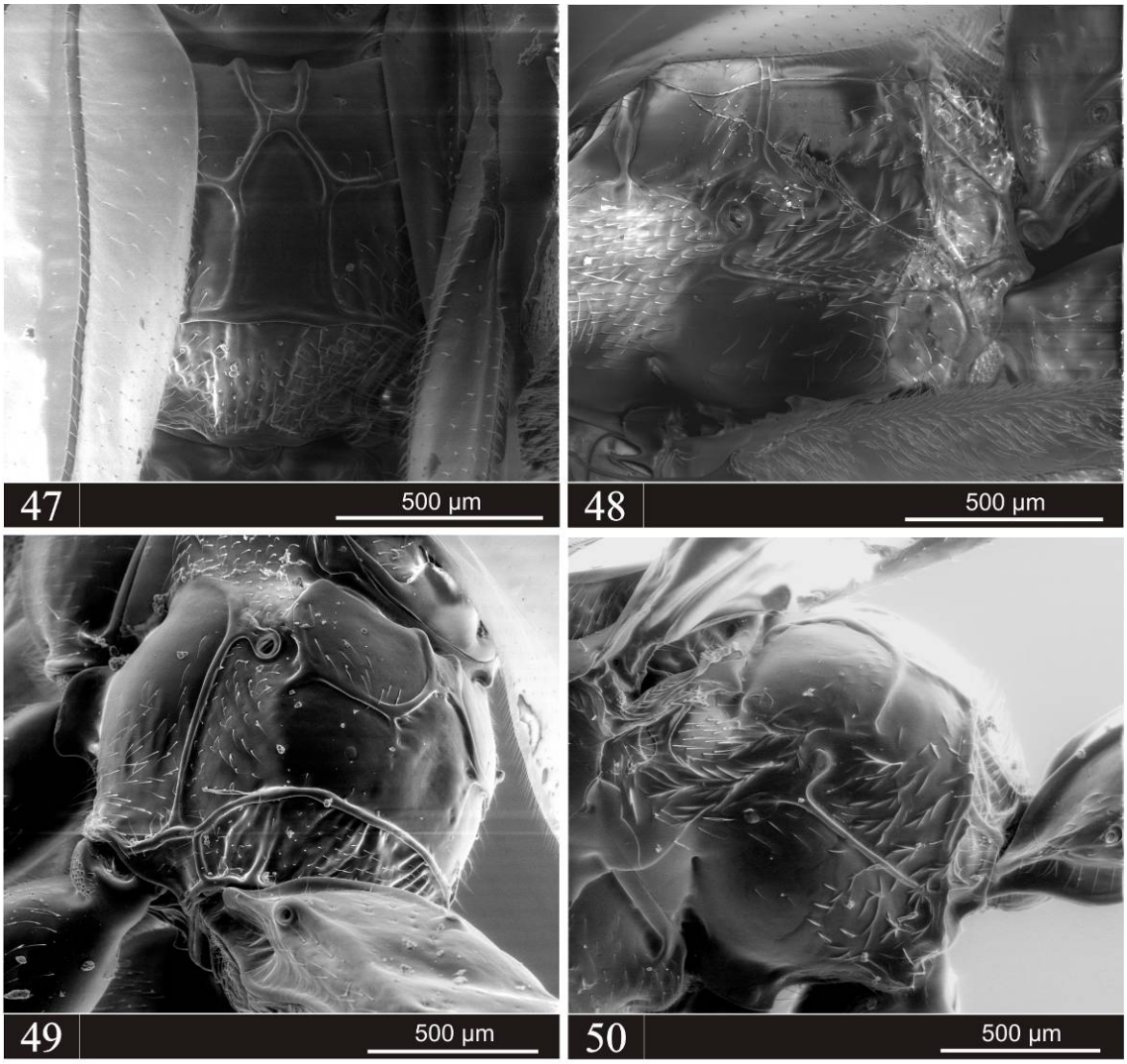
Figures 33-37. Stereoscan photographs of *Zaglyptomorpha* spp., mesoscutum; 33, *Z.* sp. nov. 1; 34, *Z.* sp. nov. 2; 35, *Z.* sp. nov. 5; 36, *Z.* sp. nov. 6; 37, *Z.* sp. nov. 7.



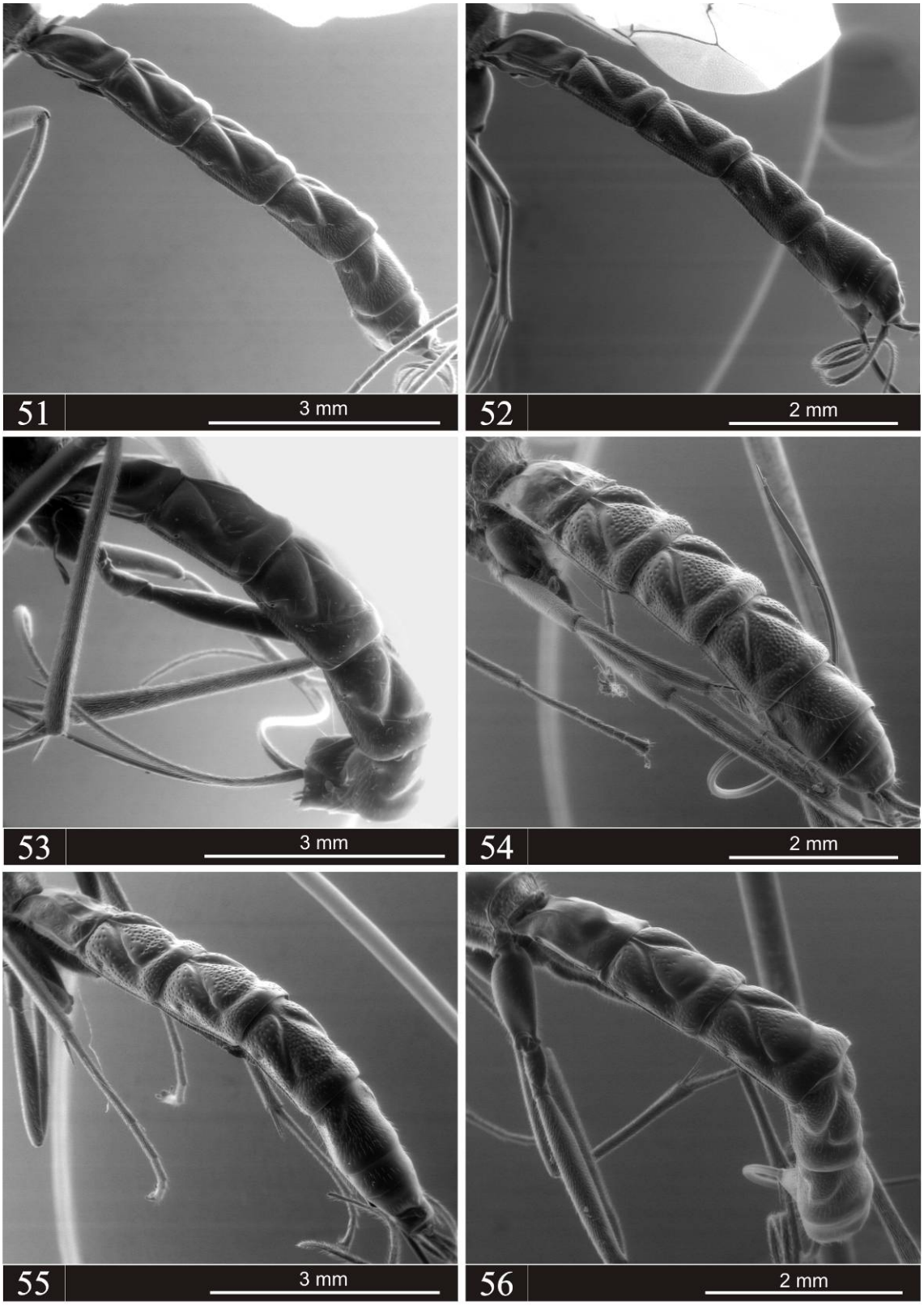
Figures 38-40. Stereoscan photographs of *Zaglyptomorpha* spp. Figs 38-39. Wings; 38, *Z.* sp. nov.1; 39, *Z.* sp. nov. 2. Fig. 40. *Z.* sp. nov. 7, fore wing.



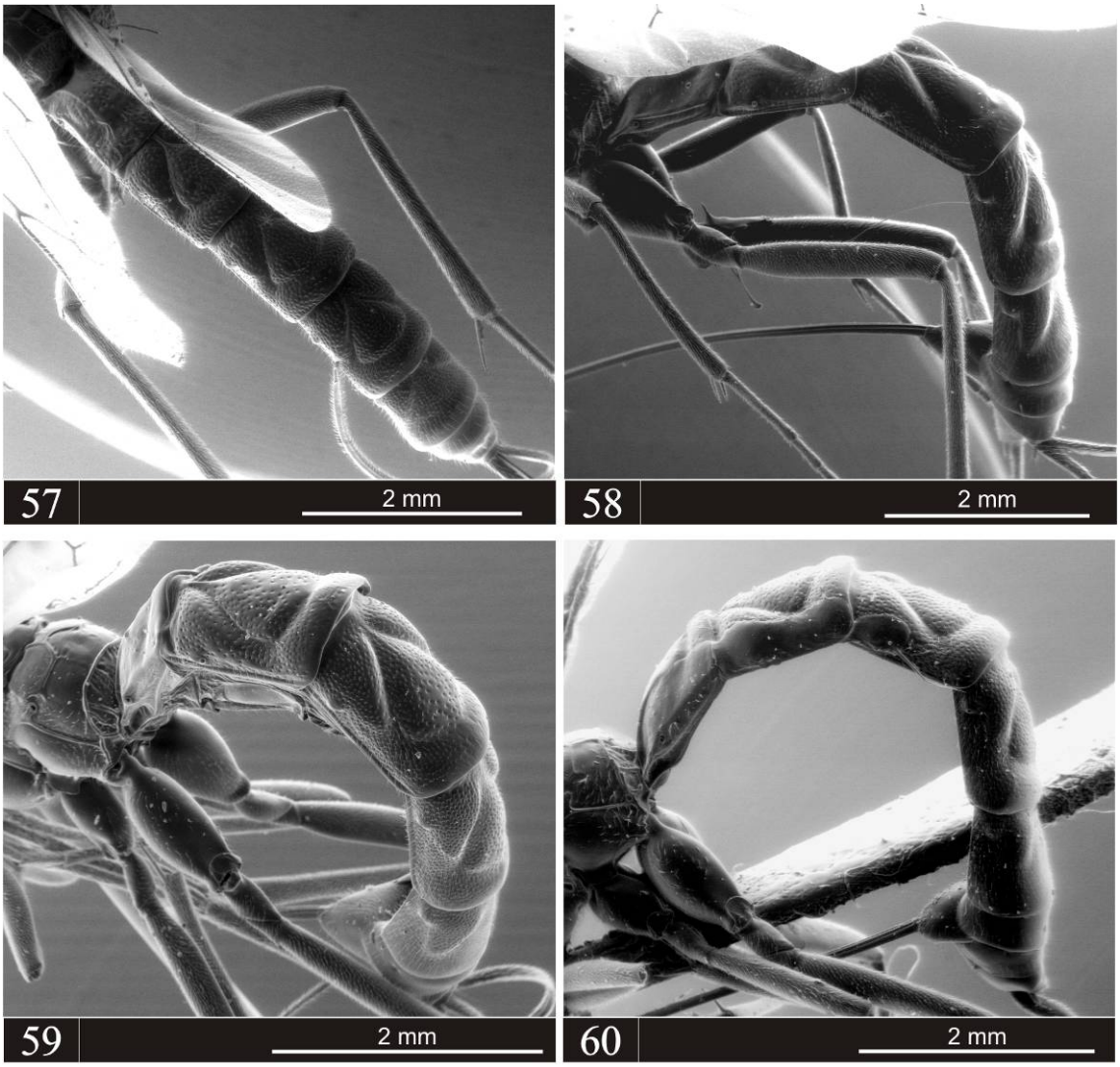
Figures 41-46. Stereoscan photographs of *Zaglyptomorpha* spp., propodeum; 41, *Z.* sp. nov. 1; 42, *Z.* sp. nov. 2; 43, *Z.* sp. nov. 3; 44, *Z.* sp. nov. 4; 45, *Z.* sp. nov. 5; 46, *Z.* sp. nov. 6.



Figures 47-50. Stereoscan photographs of *Zaglyptomorpha* spp., propodeum; 47, *Z.* sp. nov. 7; 48, *Z.* sp. nov. 8; 49, *Z.* sp. nov 9; 50, *Z.* sp. nov. 10.



Figures 51-56. Stereoscan photographs of *Zaglyptomorpha* spp., mesosoma; 51, *Z.* sp. nov. 1 ; 52, *Z.* sp. nov. 2; 53, *Z.* sp. nov 3; 54, *Z.* sp. nov. 4; 55, *Z.* sp. nov 5; 56, *Z.* sp. nov 6.



Figures 57-60. Stereoscan photographs of *Zaglyptomorpha* spp., mesosoma; 57, *Z.* sp. nov. 7; 58, *Z.* sp. nov. 8; 59, *Z.* sp. nov 9; 60, *Z.* sp. nov. 10.

Zaglyptomorpha sp. nov. 1

(Figures 1, 11, 25, 33, 38, 41, 51)

Type materials

Female holotype from Brazil, SP, São Carlos, Fazenda Macaúbas-mata 47W 53’34”, 21S 50’ 50”, Malaise trap collected on 2 Dezember 2006 E.M. Shimbori coll., in DCBU. Two Female paratypes from the same locality, collector and collecting method on 2 April 2007 and 14 May 2007, in DCBU.

Additional material examined

Female from Brazil, SP, São Carlos, Mata do Português, Malaise trap, collected on 19 June 2007 E.M. Shimbori coll., in DCBU.

Diagnosis

Zaglyptomorpha sp. nov. 1 is distinguished from *Z. decolorata* (Cresson, 1874) from Mexico in pattern color; it can be separated from *Z. attenuata* Viereck, 1913 from Paraguay and *Z.* sp. nov. 12 of Brazil because these species have a completely defined area superomedia, while the new species lacks longitudinal carinae on the propodeum, thus not forming that area (Fig. 41). It differentiates from *Z. albopicta* (Cresson, 1874) in pattern color and in the carinae of propodeum (Fig. 41). It can be recognized of *Z. longula* (Cresson,1874), *Z. danunciae* Graf, 1979 and in *Z.* sp. nov. 11 in the frons. The new species has only a raised and flared outwards carina above each antennal socket (Fig. 11), while *Z. longula* and *Z. danunciae* have a cornuted process and *Z.* sp. nov. 11 has a simplified frons. It is distinguished from *Z.* sp. nov. 2 in its metasoma sculpture characteristics: tergite II smooth and polished in *Z.* sp. nov. 1 (Fig. 51) and tergite II uniformly punctate centrally and peripherally in *Z.* sp. nov. 2 (Fig. 52).

Description

Female (holotype).

Head: Clypeus, in profile, strongly convex, in anterior view 1.4 times as broad as long, clypeal margin protuberant; malar space 0.7 times as long as basal mandibular width; lower face in lateral view, strongly convex centrally, sparsely punctate and pubescent; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 11); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this very weakly bowed forwards. Antenna with 45 flagellomeres, flagellomere I 0.9 times as long as flagellomeres II and III combined. ***Mesosoma:*** Pronotum with subvertical part of epomia dorsally strong, ventrally weak and not continuing close to lower margin of pronotum (Fig. 25); pronotum, in dorsal view with lateral margins forming two weakly convex lobes; mesoscutum smooth and polished, with some sparse, fine setae (Fig. 33); notauli present until 0.3 of way along (Fig. 33); scutellum and dorsellum smooth with some very inconspicuous setae; scutellum, in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with some sparse and inconspicuous setae; epicnemial carina present, laterally just exceeding for few the level of lower corner of pronotum; ventrally unspecialized; sternal part of mesothorax 1.9 times as long as the mid coxa; metapleuron smooth with some isolated setae posteriorly and with juxtacoxal carina absent, but with one or two transverse striae at the posterior margin of submetapleural carina; pleural carina weak but present (Fig. 41); propodeum smooth with pubescence at anterolateral and posterior margins, with posterior transverse carina complete and strong, anterior transverse carina complete but weak, lateral and lateromedian longitudinal carinae absent (Fig. 41). Fore tibia with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.3 times the

length of the shorter; hind leg with tarsomere I 1.3 times as long as tarsomeres II and III combined. Fore wing length 7.9 mm; hind wing length 5.8 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.6 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a* (Fig. 38).

Metasoma (Fig. 51) with tergite I moderately slender, about 1.5 times as long as posteriorly broad, smooth, with lateromedian longitudinal carina short, posteriorly evanescent, reaching 0.2 of way along; lateral longitudinal carina complete, stronger until spiracle level, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.4 times as long as posteriorly broad, smooth, and polished, with oblique grooves strongly impressed, convergent anteriorly, without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.2 times as long as hind tibia.

Color

Head black, clypeus orange, mandibles yellow with apex brownish; maxilar and labial palps yellow; eyes dark reddish ferrugineous with black spots. Antenna with scape and pedicel ventrally dark yellow, flagellum brown. Mesosoma uniformly orange. Wings hyaline, pterostigma black. Fore leg orange with coxa, trochanter and trochantellus light yellow; mid leg with coxa, trochanter and trochantellus light yellow, femur light orange, tibia and tarsomere I yellow with apex infuscate, tarsomeres II-V brownish; hind leg with coxa with a black spot in the anterior side, trochanter mostly dark brown, trochantellus yellow, femur mostly brown ferrugineous with ventral margin partly orange, tibia yellow with two black rings (a sub-basal and apical); tarsomere I with basal half orange, the rest dark brown, rest of tarsomeres dark brown. Metasoma with tergites I-III mostly brownish ferrugineous with basal and apical yellow band; tergite I with lateral orange spot. tergite IV-VI, black with apical

yellow band; tergite VII brownish ferrugineous with apical light brown band; tergite VIII brownish ferrugineous. Ovipositor sheaths black. Ovipositor dark orange.

Male. Unknown.

Zaglyptomorpha sp. nov. 2

(Figures 2, 12, 26, 34, 39, 42, 52)

Type material

Female holotype from Brazil: SP, São Carlos, UFSCar-CERRADO 47W 53', 21S 58', Malaise trap, collected on 29 January 2009 A.M. Penteado Dias coll., in DCBU.

Diagnosis

Zaglyptomorpha sp. nov. 2 differs from *Z. albopicta* and *Z. decolorata* in pattern color, keys out of *Z. attenuata* described from Paraguay in the propodeum, which has a completely delineated area superomedia, while *Z.* sp. nov. 2 lacks longitudinal carinae, thus not forming area superomedia (Fig. 42). Tells apart of *Z. longula*, *Z. danunciae* and *Z.* sp. nov. 11 in the frons, having a cornuted process in *Z. longula* and *Z. danunciae*, being smooth in *Z.* sp. nov. 11 and having a simple raised carina in *Z.* sp. nov. 2 (Fig. 12). It separates from *Z.* sp. nov. 1 by its metasoma sculpture characteristics: tergite II uniformly punctate centrally and peripherally in *Z.* sp. nov. 2 (Fig. 52); tergite II smooth and polished in *Z.* sp. nov.1 (Fig.51).

Description

Female (holotype).

Head: Clypeus, in profile, evenly convex in anterior view 1.5 times as broad as long, clypeal margin truncate; malar space 0.9 times as long as basal mandibular width; lower face in lateral view, convex centrally, with sparse setiferous punctures; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 12); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 45 flagellomeres, flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with upper part of epomia strong and straight, ventrally weak and not continuing close to anterior margin of pronotum (Fig. 26); pronotum, in dorsal view, with lateral margins forming two weakly convex lobes; mesoscutum smooth and polished, with some sparse, fine setae; notauli present until 0.2 of way along (Fig. 34); scutellum weakly areolate with some few fine setae, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, weakly convex; mesopleuron smooth, with ventral margin pubescent; epicnemial carina present, laterally exceeding the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.6 times as long as the mid coxa; metapleuron smooth with long fine setae centrally, without any trace of a juxtacoxal carina, but with a transverse carina and two transverse striae after the posterior margin of submetapleural carina; pleural carina weak but present to spiracle level, then absent (Fig. 42); propodeum smooth with some pubescence at posterior margin, with posterior transverse carina complete and strong, anterior transverse carina complete but weak, lateral and lateromedian longitudinal carinae absent (Fig. 42). Fore tibia with spur normally developed, 1.6 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.3 times the length of the shorter; hind leg with tarsomere I 1.2 times as long as tarsomeres II and III combined. Fore wing length 6.9 mm; hind wing length 5.1 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.7 times as long as *Cu*1b; hind wing with length of

abscissa of *Cu*1 between *M* and cu-a 0.7 times as long as the combined lengths of this vein and *cu-a* (Fig. 39).

Metasoma (Fig. 52) with tergite I moderately slender, about 1.6 times as long as posteriorly broad, smooth with some sparse setiferous punctures mainly at the posterior margin, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina strong and complete, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.3 times as long as posteriorly broad, uniformly punctate centrally and peripherally, with oblique grooves strongly impressed, convergent anteriorly, without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.5 times as long as hind tibia.

Color

Head black, clypeus yellow, surrounding area of clypeus orange, mandibles yellow with apex brownish ferrugineuos, eyes dark reddish ferrugineous with black spots; scape black, with ventral apex dark yellow, pedicel dark yellow; flagellomeres brown. Labial and maxilar palps light yellow. Mesosoma uniformly orange. Wings hyaline, pterostigma dark brown. Fore legs orange with coxa, trochanter and trochantellus light yellow; mid legs with coxa, trochanter and trochantellus light yellow, femur light orange, tibia and tarsomere I yellow with apex infuscate, tarsomeres II-V brownish; hind leg with coxa with a black spot in the anterior side, trochanter mostly dark brown, trochantellus yellow, femur brownish ferrugineous with dorsal margin orange. Metasoma: tergite I dark orange anterior an apical margins brown ferrugineous; tergites II and III similar with yellow band. Tergite IV mostly brown ferrugineous, tergite V dark orange, tergite VI basal half orange, apical half brown ferrugineous, tergites VII and VIII dark brown. Ovipositor orange and ovipositor sheaths black.

Male. Unknown.

Zaglyptomorpha sp. nov. 3

(Figures 3, 13, 27, 43, 53)

Type Material

Female Holotype from Brazil: RONDÔNIA Vilhena, 60W 08' 45", 12S 44' 26", 19/XI/1986 C. Elias, leg. POLONOROESTE (UFPR).

Diagnosis

It separates to *Z. attenuata* and *Z. albopicta* in the carinae of propodeum, forming a defined area superomedia in *Z. attenuata*, having a weakly delineated area superomedia in *Z. albopicta* and with only a posterior transverse carina in the new species (Fig. 43). It distinguishes to *Z. danunciae* and *Z. longula* in the frons, with a cornuted process in these species and a slightly raised carina above each antennal socket in the new species (Fig. 13). It recognizes from *Z. decolorata* in pattern color.

Description

Female (holotype).

Head: Clypeus, in profile, evenly convex, in anterior view 1.9 times as broad as long, clypeal margin truncate; malar space 1.2 times as long as basal mandibular width; lower face rather flat, smooth; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 13); occipital carina dorsally, centrally interrupted, lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 50 flagellomeres, flagellomere I 0.8 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and something sinuous, not reaching dorsal nor ventral margins (Fig. 27); pronotum, in dorsal view with rather truncated lateral margins; mesoscutum smooth and polished, with some

sparse, fine setae; notauli present until 0.5 of way along; scutellum with some weak punctures; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with some sparse and inconspicuous setae; epicnemial carina present, laterally exceeding the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.6 times as long as the mid coxa; metapleuron smooth with some sparse fine setae and a posterior transverse stria, and with a carina originating from the posterior margin of submetapleural carina and extending dorsally toward the apical part of metapleuron; pleural carina weak but present to spiracle level, then absent (Fig. 43); propodeum smooth with some pubescence at posterior margin, with only a strong posterior transverse carina present (Fig. 43). Fore tibia with spur normally developed, 1.8 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.3 times the length of the shorter; hind leg with tarsomere I 1.2 times as long as tarsomeres II and III combined. Fore wing length 10.8 mm; hind wing length 7.8 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.4 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 53) with tergite I moderately slender, about 1.3 times as long as posteriorly broad, smooth with some few weak areolae, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina in lateral view, only evident at the anterior and the posterior margins, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.3 times as long as posteriorly broad, smooth, with oblique grooves strongly impressed, convergent anteriorly, without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 1.9 times as long as hind tibia.

Color

Head black, clypeus yellow, mandibles yellow with apex orange with margins brown ferrugineous; eyes brown. Antenna blackish. Mesosoma orange. Fore wing with a median and an apical dark brown spots; pterostigma dark brown; hind wings with a submedial brown spot. Fore and mid legs orange; hind legs brown ferrugineous. Metasoma mostly orange, tergite IV with apex with a brown ferrugineous band, tergite V + brown ferrugineous; sternites mostly yellow, last two sternites brown ferrugineous. Ovipositor orange and ovipositor sheaths black.

Male. Unknown.

Zaglyptomorpha sp. nov. 4

(Figures 4, 14, 21, 35, 44, 54)

Type Material

Female holotype from Brazil: SP Iperó, Flona de Ipanema, Morro Araçoiaba-Trilha caminho da Cobra Ponto 3, Malaise, 47W 37 ' 07.2 " , 23S 27 ' 01.7", 833 m, 17.IX-24.X.2007. Arouca e equipe col. (DCBU).

Diagnosis

It resembles *Z. danunciae* and *Z. longula* having a frons with a strong angular projection (Fig. 14). It distinguishes from *Z. decolorata* and *Z. albopicta* in pattern color. Distinguishes to *Z. danunciae* and *Z. longula* in that these species have a complete lateral longitudinal carina and *Z.* sp. nov. 4 has a lateral longitudinal carina interrupted between anterior and posterior transverse carina (Fig. 44).

Description

Female (holotype).

Head: Clypeus, in profile, weakly convex, in anterior view, 1.5 times as broad as long; clypeal margin truncate; malar space 1.3 times as long as basal mandibular width; lower face rather flat, with setiferous punctures; frons with a strong angular projection (Fig. 14); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards (Fig. 21). Antenna with 48 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with upper part of epomia strong and very close to the dorsal margin of pronotum, ventrally weaker and evanescent not achieving lower margin (Fig. 35); pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth with some sparse setae; notauli present until 0.3 of way along (Figs 21, 35); scutellum mostly smooth with some weak areolae and sparse dark setae, dorsellum something punctuate; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth, with long, fine setae; epicnemial carina present, laterally not reaching the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.8 times as long as the mid coxa; metapleuron smooth with setiferous sparse setiferous punctures all over, and with a strong mostly longitudinal carina from the posterior margin of submetapleural carina to the apical part of metapleuron; pleural carina weak but present to spiracle level, then absent (Fig. 44); propodeum smooth with setiferous punctures, more concentrated at posterior margin, with lateral longitudinal carina interrupted between anterior and posterior transverse carina (which are present and strong), lateromedian longitudinal carina present (Fig. 44). Fore tibia with spur normally developed, 2.1 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.0 times the length of the shorter; hind leg with tarsomere I 1.5 times as long as tarsomeres II and III combined. Fore wing length 7.5 mm; hind wing length 5.4 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.6 times as long as *Cu*1b;

hind wing with length of abscissa of *Cu*1 between *M* and cu-a 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 54) with tergite I moderately slender, about 1.3 times as long as posteriorly broad, smooth with sparse setiferous punctures, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina complete, with a vestige of a central carina on the posterior margin; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.2 of way along; tergite II 1.1 times as long as posteriorly broad, the raised triangular area centrally coarsely and sparsely punctate, and laterally smooth; the rest of tergite II smooth with some coarse punctures in the anterior and posterior margins, with oblique grooves strongly impressed, convergent anteriorly, and with a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.5 times as long as hind tibia.

Color

Head black, clypeus yellow, mandibles and surrounding area yellow with apex brown ferrugineous. Antenna black; maxilar and labial palps yellow. Mesosoma mostly orange, metapleuron mostly yellow. Wings infumate, pterostigma dark brown. Propodeum mostly black with two orange spots in the area externa. Fore legs orange, with coxa and trochanter light yellow; mid legs with coxa yellow, trochanter yellow with an outer spot, femur and tibia orange; tarsomeres mostly dark orange; hind legs, coxa yellow with a lateral blackish spot, trochanter mostly black, trochantellus light brown, femur brownish ferrugineous with an orange ring; tibia dark brown with a basal yellow ring; tarsomere I dark brown with base yellow. Metasoma ferrugineous brown. Ovipositor dark orange, ovipositor sheaths black.

Male. Unknown

Zaglyptomorpha sp. nov. *5*

(Figures 5, 15, 22, 28, 45, 55)

Type Material

Female holotype from Brazil: SP, Jundiaí, Serra do Japí, 46W 56' 18" , 23S 13' 55" Armadilha Malaise- (“pântano”) 20.I.2008. J.F.Sobczak col. (DCBU).

Diagnosis

It resembles to *Z. danunciae* and *Z. longula* in having a strong angular projection in the frons. However, the epicnemial carina laterally reaches clearly above the level of lower corner of pronotum *in Z. danunciae*, and not reaches the level of lower corner of pronotum in *Z.* sp. nov. 5. The carinae of the propodeum is complete in *Z. longula* and without lateral longitudinal carina in *Z.* sp. nov. 5 (Fig. 45). It tells apart in pattern color of *Z. decolorata*, *Z. attenuata* and *Z. albopicta*. It differentiates to Z. sp. nov. 7 in metasoma sculpture: Tergite II with the lateral area with only some sparse setiferous punctures in *Z.* sp. nov. 5 (Fig. 55), Tergite II coarsely and uniformly punctuate all over in Z. sp. nov. 7 (Fig. 57).

Description

Female (holotype).

Head: Clypeus, in profile, weakly convex, in anterior view 1.5 times as broad as long, clypeal margin truncate, malar space 0.5 times as long as basal mandibular width, lower face weakly convex, with setiferous punctures; frons with a strong angular projection (Fig. 15); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 48 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: pronotum with epomia strong, weakly bowed, extending from near upper margin of pronotum downwards to near lower corner, the lower part subparallel to anterior margin of pronotum (Fig. 28); pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth with sparse setae; notauli present until 0.4 of way along; scutellum with long black setae and few isolated punctures, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth, with ventral margin pubescent; epicnemial carina present, laterally not reaching the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.4 times as long as the mid coxa; metapleuron smooth and uniformly pubescent and with a weak mostly transverse carina at the posterior margin of submetapleural carina; pleural carina complete (Fig. 45); propodeum smooth with setiferous punctures more concentrated in the area petiolaris, with lateromedian longitudinal carina present between the anterior and the posterior transverse carinae, lateral longitudinal carina absent (Fig. 45). Fore tibia with spur normally developed, 2.1 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.0 times the length of the shorter; hind leg with tarsomere I 1.4 times as long as tarsomeres II and III combined. Fore wing length 8.3 mm; hind wing length 6.4 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.0 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 55) with tergite I moderately slender, about 1.4 times as long as posteriorly broad, smooth with setiferous punctures on lateral margins, with lateromedian longitudinal carina reaching 0.9 of way along, but sclerotized only until 0.2 of way along; lateral longitudinal carina complete, with a vestige of a central carina on the posterior margin; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; tergite II 1.2 times as long as posteriorly broad, the raised triangular area centrally coarsely

punctate, laterally smooth, the rest of tergite II with some setiferous punctures specially in lateral and posterior margins, with oblique grooves strongly impressed, convergent anteriorly, with a distinct median longitudinal carina-like ridge; tergites III and IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.4 times as long as hind tibia.

Color

Head black, clypeus mandibles and surrounding area brownish, apex dark brown, maxilar and labial palps orange; eyes brownish violet with black spots. Antenna black. Mesosoma orange. Propodeum with a blackish spot in the area superomedia. Fore legs orange with coxa, trochanter and trocantellus yellow; mid legs with coxa light yellow, trochanter blackish, trochantellus yellow, femur orange, tibia orange with apex brown, tarsi brownish; hind legs with coxa mostly black with posterior side yellow.

Male. Unknown.

Zaglyptomorpha sp. nov. 6

(Figures 6, 16, 29, 36, 46, 56)

Type material

Female holotype from Brazil: SANTA CATARINA, São Bento do Sul, Río Natal. 49W 22' 43" , 26S 15' 01", 838,39 m. Marco/2002. Armadilha Malaise. M.M. Dombeck col. (DCBU).

Diagnosis

It differs of *Z.* sp. nov. 11, *Z. danunciae*, and *Z. longula* in frons characteristics. *Z.* sp. nov. 11 has a smooth frons, the others have a strong angular projection, while *Z.* sp. nov. 6

has a slightly raised and flared outwards carina above each antennal socket (Fig. 16). *Z. attenuata* has a completely delineated area superomedia, while *Z.* sp. nov. 6 lacks longitudinal carinae, thus not forming an area superomedia (Fig. 46). It differentiates in pattern color of *Z. decolorata* and *Z. albopicta*.

Description

Female (holotype).

Head: Clypeus, in profile, convex, in anterior view, 2.0 times as broad as long; clypeal margin truncate; malar space 0.9 times as long as basal mandibular width; lower face weakly convex, with setiferous punctures; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 16); occipital carina dorsally, centrally interrupted (Fig. 36); lower part of occipital carina complete, reaching hypostomal carina at base of mandible. Antenna with 42 flagellomeres, flagellomere I 1.0 times as long as flagellomeres II and III combined. ***Mesosoma:*** Pronotum with subvertical part of epomia dorsally and ventrally weak and evanescent, not reaching dorsal nor ventral margins (Fig. 29); pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth; notauli present until 0.3 of way along (Fig. 36); scutellum foveolate, dorsellum with some punctures; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with setae more concentrated on lower margin; epicnemial carina present, laterally exceeding the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.7 times as long as the mid coxa; metapleuron smooth with setae on upper and posterior margins, and with a transverse carina at the posterior margin of the submetapleural carina; pleural carina weak but present to spiracle level, then absent (Fig. 46); propodeum smooth with setae on lateral and posterior margins, with anterior and posterior transverse carina present, lateromedian and lateral longitudinal carinae absent (Fig. 46). Fore tibia with spur normally developed, 1.7 times as long as breadth of tibia; mid tibia with spurs more or

less equal, the longer 1 times the length of the shorter; hind leg with tarsomere I 1.5 times as long as tarsomeres II and III combined. Fore wing length 7.5 mm; hind wing length 5.6 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.0 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 56) with tergite I moderately slender, about 1.5 times as long as posteriorly broad, smooth and polished, with lateromedian longitudinal carina reaching 0.4 of way along, lateral longitudinal carina complete, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.5 times as long as posteriorly broad, smooth and polished except for a few punctures, with oblique grooves strongly impressed, convergent anteriorly, and with a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.0 times as long as hind tibia.

Color

Head black; eyes brown with some weak blackish spots. Clypeus and surrounding area yellow, with apex brown; labial and maxilar palps yellow. Antenna with scape and pedicel dark brown. Flagellomere brown. Mesosoma mostly orange with scutellum and dorsellum yellowish. Pronotum, ventrally yellowish. Wings something infuscate, pterostigma brown. Fore legs light orange; mid legs: coxa, trochanter, trochantellus and femur light orange, tibia orange with an apical brown spot; tarsomere I brownish with base yellowish, tarsomere II + brownish; hind legs with coxa light orange with two lateral strips (on inner and outer side); trochanter orange with a basal dark brown spot; trochantellus, light orange; femur mostly orange with basal and apical brown spots; tibia mostly yellow, base and apex brown; tarsomeres I brown with basal half yellow; tarsomeres II + brown. Metasoma brownish

ferrugineous, tergite I-III with apical yellowish band (strip), tergite IV+ with an apical orange strip. Ovipositor orange, ovipositor sheaths blackish.

Male. Unknown.

Zaglyptomorpha sp. nov.7

(Figures 7, 17, 23, 37, 40, 47, 57)

Type Material

Female holotype from Brazil, SP state, Vargem Grande Paulista, 47W 00' 47" , 23S 22' 24", 875 m., IV/1997. Brombal, J.C. col. NKI 24-017. (DCBU).

Diagnosis

It resembles *Z. danunciae*, and *Z. longula* in having a strong angular projection (Fig. 17). While *Z. danunciae* have a mid longitudinal carina dividing the superomedia area, *Z.* sp. nov. 7 lacks this carina (Fig. 47). Also the pattern color is different between these two species. *Z. longula* has complete carinae, while *Z.* sp. nov. 7 lacks lateral longitudinal carina (Fig. 47). It distinguishes to *Z. attenuata*, *Z. albopicta* and *Z. decolorata* in pattern color.

Description

Female (holotype).

Head: Clypeus, in profile, very weakly convex, in anterior view 1.4 times as broad as long; clypeal margin convex; malar space 0.8 times as long as basal mandibular width; lower face rather flat, with setiferous punctures; frons with a strong angular projection (Fig. 17); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed

forwards. Antenna with 44 flagellomeres; flagellomere I 1.1 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with epomia strong, ending as a pointed swelling near dorsal margin, the upper part straight angled at junction with lower part, which is subparallel to anterior margin of pronotum; pronotum, in dorsal view, with rather truncated lateral margins (Fig. 23); mesoscutum with setiferous punctures all over; notauli present until 0.5 of way along (Figs 23, 37); scutellum smooth with some setae, dorsellum smooth and polished; scutellum in lateral view, convex, with posterior end, in dorsal view, weakly convex; mesopleuron smooth with setae all over except posterodorsal margin; epicnemial carina present, laterally exceeding the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.7 times as long as the mid coxa; metapleuron smooth with long setae all over and with a weak mostly longitudinal carina from the posterior margin of submetapleural carina to the apical part of metapleuron; pleural carina weak but present (Fig. 47); propodeum smooth with setae on lateral and posterior margins, with anterior transverse carina present, posterior transverse carina present and strong, lateromedian longitudinal complete, lateral longitudinal carina absent (Fig. 47). Fore tibia with spur normally developed, 1.9 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.0 times the length of the shorter; hind leg with tarsomere I 1.5 times as long as tarsomeres II and III combined. Fore wing length 6.2 mm; hind wing length 4.2 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.6 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a* (Fig. 40).

Metasoma (Fig. 57) with tergite I moderately slender, about 1.1 times as long as posteriorly broad, smooth with sparse setiferous punctures, with lateromedian longitudinal carina in dorsal view, reaching 0.7 of way along; lateral longitudinal carina complete, without

any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.5 of way along; tergite II 1.1 times as long as posteriorly broad, coarsely but quite sparsely punctuate, with oblique grooves strongly impressed, convergent anteriorly, with a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.2 times as long as hind tibia.

Color

Head black, clypeus light yellow, mandibles and surrounding area light yellow with apex brownish; labial and maxilar palps yellow; eyes brown with black spots. Antenna with scape dark brown; flagellum brown. Mesosoma mostly orange, with pronotum dorsally, tegula scutellum and dorsellum yellow. Wings hyaline, pterostigma brown. Fore legs orange with coxa, trochanter and trochantellus light yellow; mid legs with coxa and trochantellus light yellow, trochanter light yellow with a ventral blackish spot, femur orange, tibia light yellow with a diffuse sub-basal brown spot and a apical brown ring; basitarsus mostly dark brown with anterior half yellow, tarsomeres II-III dark brown with basal and apical light brown rings; tarsomere IV light brown, tarsomere V dark brown; hind leg with coxa mostly yellow with two brown bands at outer and inner sides; trochanter mostly dark brown, trochantellus light yellow; femur orange, basally and apically brown; tibia mostly whitish, the rest, specially a sub-basal and apical ring dark brown; basitarsus mostly dark brown with anterior half yellow; tarsomere II dark brown with a basal yellow ring; tarsomeres III-V dark brown. Metasoma with tergites I-IV dark orange with tergites V+ dark brown. Ovipositor orange, ovipositor sheaths blackish.

Male. Unknown.

Zaglyptomorpha sp. nov. 8

(Figures 8, 18, 24, 30, 48, 58)

Type Material

Female holotype from Brazil: Santa Catarina, Nova Teutônia, III/1970, 52 W 25’27”, 27 S 09’49”. F. Plaumann leg. (UFPR).

Diagnosis

It differs to *Z. danunciae* and *Z. longula*, in frons characteristics. These two species have a strong angular projection above each antennal insertion and *Z.* sp. nov. 8 have only a slightly raised and flared outwards carina above each antennal socket (Fig. 8). It distinguishes from *Z. attenuata*, *Z. albopicta* and *Z. decolorata* in pattern color.

Description

Female (holotype).

Head: Clypeus, in profile, convex, in anterior view 1.7 times as broad as long; clypeal margin truncate; malar space 0.8 times as long as basal mandibular width; lower face moderately convex centrally, finely punctuate; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 18); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards (Fig. 24). Antenna incomplete; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and something sinuous, not reaching dorsal nor ventral margins (Fig. 30); pronotum, in dorsal view, with lateral margins forming two weakly convex lobes; mesoscutum smooth and polished, with some sparse, fine setae; scutellum smooth with spots like foveolae, dorsellum

smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with some sparse and inconspicuous setae; epicnemial carina weak, laterally not reaching the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.5 times as long as the mid coxa; metapleuron smooth, with a weak mostly longitudinal carina from the posterior margin of submetapleural carina to the apical part of metapleuron; pleural carina weak but present (Fig. 48); propodeum smooth with some pubescence at posterior margin, with carinae more or less complete, posterior transverse carina complete and strong, lateromedian and lateral longitudinal carinae present anteriorly (absent behind anterior transverse carina) (Fig. 48). Fore tibia with spur normally developed, 2.1 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.3 times the length of the shorter; hind leg with tarsomere I 1.4 times as long as tarsomeres II and III combined. Fore wing length 8.2 mm; hind wing length 5.9 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.6 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and cu-a 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 58) with tergite I moderately slender, about 1.5 times as long as posteriorly broad, smooth with sparse setiferous punctures, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina complete, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.2 times as long as posteriorly broad, smooth, with oblique grooves strongly impressed, convergent anteriorly and without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.6 times as long as hind tibia.

Color

Head black; clypeus mandible and surrounding area, labial and maxilar palps yellow, apex of mandible dark reddish; eyes brown with blackish spots. Antenna brown. Mesosoma orange with anterodorsal and posterodorsal margin of pronotum, subalar prominence and scutellum yellow. Wings something infumate with pterostigma brown. Fore legs with coxa, trochanter and trochantellus yellow, femur, tibia and tarsus orange; mid legs with coxa, trochanter, trochantellus yellow; femur orange, basal half yellowish; tibia orange with distal apex darker; tarsomere I brown, base yellowish; tarsomeres II-V brownish; hind legs, coxa yellow with two dark orange spots on inner and outer sides; trochanter brownish, trochantellus yellow; femur brown; tibia mostly yellowish with sub-basal and apical brown ring; tarsomere I basally yellow, the rest brown, tarsomere II + brown, Metasoma with tergite I mostly ferrugineous, with two anterolateral orange spots, posterior margin with a transverse strip. Tergite II + orange ferrugineous, with posterior margins with transverse orange strip. Ovipositor orange, ovipositor sheaths black.

Male. Unknown.

Zaglyptomorpha sp. nov. 9

(Figures 9, 19, 31, 49, 59)

Type material

Female holotype from Brazil: SP, Barueri, 46W 31' 58", 23S 18' 04", 719 m., 02.I/1966. K. Lenko col. (DPTO ZOOL. UFPR). (UFPR).

Diagnosis

It differs from *Z. danunciae* and *Z. longula* in frons characteristics. These two species have a strong angular projection, while *Z.* sp. nov. 9 has a frons with carina slightly raised (Fig. 19). It does not have a completely delineated area superomedia (Fig. 49), which

distinguishes it to *Z. attenuata*. It separates from *Z. decolorata* and *Z. albopicta* in pattern color.

Description

Female (holotype).

Head: Fore wing length 7.4 mm; hind wing length 5.4 mm. Clypeus, in profile, convex, in anterior view 1.7 times as broad as long, clypeal margin truncate; malar space 0.7 times as long as basal mandibular width; lower face convex with sparse setiferous punctures; frons with only a slightly raised and flared outwards carina above each antennal socket (Fig. 19); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible. Antenna with 44 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and something sinuous, not reaching dorsal nor ventral margins (Fig. 31); pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth; notauli present until 0.5 of way along; scutellum smooth with spots like foveolae, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with some inconspicuous setiferous punctures on the lower margin; epicnemial carina present, laterally exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.7 times as long as the mid coxa; metapleuron mostly smooth with some transverse striae at the posterior area, some sparse long setae on the upper margin, and with a small transverse carina at the posterior margin of submetapleural carina; pleural carina present to spiracle level, then absent; propodeum smooth with setiferous punctures, more concentrated at posterior margin, with lateromedian longitudinal carina present in front anterior transverse carina (which is weak), posterior transverse carina present, lateral longitudinal carina absent. Fore tibia with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia with spurs more or less

equal, the longer 1.1 times the length of the shorter; hind leg with tarsomere I 1.4 times as long as tarsomeres II and III combined. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.7 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 59) with tergite I moderately slender, about 1.4 times as long as posteriorly broad, smooth with some sparse setiferous punctures mainly at the posterior margin, with lateromedian longitudinal carina reaching 0.4 of way along, lateral longitudinal carina complete but weak, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; tergite II 1.5 times as long as posteriorly broad, with fine close, punctures, uniformly distributed on the lateral and the central raised triangular area; with oblique grooves strongly impressed, convergent anteriorly, and with a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.6 times as long as hind tibia.

Color

Head black, clypeus mandibles yellow with apex dark brownish; eyes brown surrounding area of clypeus and mandibles dark orange. Antenna with scape, pedicel and first flagellomere, scape and pedicel with apical margin orange; flagellomeres II + brown. Mesosoma mostly orange with ventral and dorsal margin, part of subalar prominence, part of scutellum and dorsellum yellow. Wings infumate, pterostigma brown. Fore legs orange with coxa, trochanter, trochantellus and base of femur yellow; mid legs with coxa, trochanter, femur and tibia yellow (apical half of tibia brownish); tarsomeres brown, basal half of basitarsus yellow; hind legs dark orange with inner and outer ferrugineous spots; trochanther partly ferrugineous the rest yellow, trochantellus yellow, femur with dorsal and ventral sides mostly yellow, inner and outer sides ferrugineous. Tibia mostly yellow with sub-basal and

apical ferrugineous rings. Tarsomere I with 2/3 basal yellow, 1/3 apical ferrugineous; rest of tarsomeres ferrugineous. Metasoma with tergites mostly I-V variably ferrugineous with posterior margin with orange strip; tergites VI orange in part, tergites VII + solid dark uniform ferrugineous. Ovipositor sheaths blackish.

Male. Unknown.

Zaglyptomorpha sp. nov. 10

(Figures 10, 20, 32, 50, 60)

Type Material

Female holotype from Brazil, SP, Campos do Jordão Eug. Lefevre: 1200 m. 24. Jan. 1963 J. Guimarães, Medeiros, L. Silva, A. Rocha & L.T.F. (DPTO ZOOL. UFPR). (UFPR).

Diagnosis

Its frons characteristics distinguishes to *Z. danunciae* and *Z. longula; Z.* sp. nov. 10 has a simple carina (Fig. 20), while the other two species have a strong angular projection. It tells apart of *Z. decolorata*, *Z. attenuata* and *Z. albopicta* in pattern color. It differs from *Z.* sp. nov. 12 in tergite II characteristics: Tergite II without a distinct median longitudinal carina like ridge and epicnemial carina laterally just reaching to about the level of lower corner of pronotum in *Z.* sp. nov. 10, while tergite II with a distinct median longitudinal carina like ridge and epicnemial carina laterally exceeding the level of lower corner of pronotum in *Z.* sp. nov. 12.

Description

Female (Holotype).

Head: Clypeus, in profile, convex, in anterior view 1.5 times as broad as long; clypeal margin truncate; malar space 0.8 times as long as basal mandibular width; lower face convex and pubescent; frons with only a low and simple arcuate carina above each antennal socket (Fig. 20); occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 45 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and evanescent, not reaching dorsal nor ventral margins (Fig. 32); pronotum, in dorsal view, forming two swelling lobes; mesoscutum smooth with a heart-shaped central concavity; notauli present until 0.5 of way along; scutellum mostly smooth with some weak areolae, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with setae more concentrated on lower margin; epicnemial carina present, laterally just reaching to about the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.5 times as long as the mid coxa; metapleuron smooth with some sparse setae on posterior and higher margins, with no trace of a juxtacoxal carina, but with a weak transverse carina at the apical margin of submetapleural carina; pleural carina weak but present to spiracle level, then absent (Fig. 50); propodeum smooth with setiferous punctures more concentrated in the area petiolaris, with anterior transverse carina present but weak, lateromedian longitudinal carina present in front of the posterior transverse carina (which is complete and strong), lateral longitudinal carina absent (Fig. 50). Fore tibia with spur normally developed, 2.1 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1 times the length of the shorter; hind leg with tarsomere I 1.3 times as long as tarsomeres II and III combined. Fore wing length 7.4 mm; hind wing length 5.5 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.5 times as long as

*Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.5 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 60) with tergite I moderately slender, about 1.2 times as long as posteriorly broad, smooth with some sparse setae on posterolateral margins, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina complete, stronger until spiracle level, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; tergite II 1.0 times as long as posteriorly broad, coarsely but quite sparsely punctuate, with oblique grooves strongly impressed, convergent anteriorly, without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 3.0 times as long as hind tibia.

Color

Head black, clypeus, mandibles, labial and maxilar palps yellow, surrounding area of mandibles orange, apex of mandibles dark orange; eyes brown. Antenna dark brown, scape and pedicel with apex dark orange. Mesosoma mostly orange. Pronotum with dorsal and ventral side, subalar prominence, tegula, dorsellum yellow, scutellum, in part yellow. Wings hyaline with pterostigma brown. Fore legs orange; mid legs with coxa, trochanter, trochantellus, femur orange; tarsomere I with basal half yellow, the rest brown; tarsomeres II + brown; hind legs with coxa orange with inner and outer ferrugineous spots; trochanter mostly ferrugineous, trochantellus yellow; femur mostly brownish; tibia with anterior side mostly yellow, posterior side brownish ferrugineous; tarsomere I ferrugineous with first half orange; tarsomeres II + ferrugineous. Metasoma with tergite I, centrally ferrugineous, laterally orange, with posterior margin with a fine yellowish strip; tergite II mostly ferrugineous with posterior margin with a yellowish strip; tergite III mostly ferrugineous with

some central dark orange spots, and posterior margin with a yellowish strip; tergites IV + ferrugineous. Ovipositor dark orange, ovipositor sheaths dark brownish.

Male. Unknown.

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4.4.4 Five new species of the genus *Sphelodon* (Hymenoptera: Ichneumonidae: Banchinae) from Brazil with a key to the Brazilian species.

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Abstract: Five new species of the genus *Sphelodon* Townes 1966 are described and illustrated from several regions of Brazil. An identification key to the Brazilian species is provided.

Key words: Wasps, Glyptini, South America, identification key, taxonomy.

The genus *Sphelodon* TOWNES (1966) includes at the moment, eight species registered in the New World (YU & HORSTMANN, 1998; YU *et al*., 2005); three of them are exclusively Nearctic: *S. beameri* Dasch, 1988, *S. concolor* Dasch, 1988, and *S. nomene* (Davis, 1988); four have a Neotropical distribution: *S. guanacastensis* GODOY & GAULD (2002), *S. ugaldei* Godoy & Gauld, 2002, *S. wardae* Godoy & Gauld, 2002, so far only registered in Costa Rica, and *S. annulicornis* (Morley,1914), which is the only species of this

genus already registered in Brazil, but also with individuals known to occur in Mexico and Costa Rica, suggesting it is very probably widespread throughout the Neotropical region (GAULD *et al*. 2002). The last species *S. phoxopteridis* (Weed, 1888) is founded both in Nearctic and Neotropical regions (YU & HORSTMANN, 1998; GAULD *et al*. 2002; YU *et al*., 2005). The main diagnostic feature of *Sphelodon* is its first abdominal tergite with a prominent basolateral tooth, giving this genus its name (i.e. *sphelas*= pedicel, plus *odons*= tooth). The only host records for any species of this genus belong to the Nearctic region, known hosts include the lepidopterous families Oecophoridae, Pyralidae and Tortricidae (DASCH, 1988; GAULD *et al*. 2002).

Here five new species of *Sphelodon* are keyed and described from Brazil.

Material and methods

The material included was obtained in the main entomological collections of the Southeast and South of Brazil: Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos, São Carlos, SP, Brasil (DCBU), Universidade Federal de Paraná (UFPR), Museu de Zoologia Universidade de São Paulo (MZUSP), Universidade Federal de Espírito Santo (UFES), Universidade Federal de Rio de Janeiro (UFRJ), Coleção Entomológica Instituto Oswaldo Cruz (CEIOC), and material from the Project Biota Noroeste UNESP São José de Rio Preto (UNESP-SJRP).

The nomenclatural treatment, morphological terminology and taxonomic characters used here follow GAULD (1991) and GAULD *et al*. (2002). Type material from other described species of the genus was not available to us, but species treated in this study were compared with those included in GAULD *et al*. (2002) or through confrontation with the original descriptions. MORLEY (1914) and DASCH (1988) provided comprehensive

information; data from those works have been used here to produce the key for the Brazilian *Sphelodon* species.

Sphelodon n. sp.1

(Figs 1, 10, 15, 20)

Diagnosis. It differs from the other described species of the genus in having the flagellum without a median whitish band.

Female.

Head: Clypeus 1.5 times as broad as long; lower face flat and smooth; malar space 0.7 times as long as basal mandibular width; frons flat and smooth; occipital carina dorsally centrally interrumpted, its lower end reaching hypostomal carina before mandibular base; head in dorsal view, with gena very strongly constricted behind eyes, flat. Antenna incomplete (without apical flagellomeres); flagellum without a median whitish band.

Mesosoma: Pronotum long, not swollen above epomia, the epomia itself strong but short, not reaching the upper margin of the pronotum; mesoscutum centrally rather finely and sparsely punctate with hairs, laterally weakly punctulate with setae; notauli quite strongly impressed anteriorly; mesopleuron polished with some sparse punctures; epicnemial carina dorsally sinuous, not reaching the anterior margin of mesopleuron and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.4 times as long as the mid coxa. Metapleuron uniformly finely and sparsely punctate, with a transverse stria at the anterior margin of the submetapleural carina, and a strong carina from the posterior margin of submetapleural carina and the apical margin of metapleuron. Pleural carina complete and strong (Fig. 10); propodeum with carinae complete and strong, delineating an elongate

enclosed area superomedia (Fig. 10). Fore tibia with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface and with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 9.1 mm; hind wing length 6.5 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.7 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.8 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 15) with tergite I smooth and polished, with lateromedian longitudinal carinae quite strong, present on anterior 0.6; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along, base with a rather rounded lateral tooth, which margin points to the side (Fig. 20); tergite II 1.0 as long as posteriorly broad, with oblique grooves strongly impressed, with central triangular and lateral areae smooth and with some fine and sparse pubescence; tergites III-IV similar though the latter with the oblique grooves very weak, almost vestigial. Ovipositor of moderate length, 1.7 times as long as hind tibia.

Coloration. Head mostly black. Lower face partly yellow, clypeus and mandible yellow. Apex of mandibles ferrugineous. Gena posteriorly ferrugineous, anteriorly surrounding area of eye dark orange. Labial and maxilar palps orange. Antenna brown, pedicel orange, in dorsal margin. Mesosoma orange. Fore wing with two brownish spots close to the middle at the posterior margin, pterostigma yellow; hind wing infuscate (hyaline yellowish). Fore and mid legs orange, hind legs with coxa, trochanter, trochantellus and base of femur dark orange, tibia and tarsomere brownish. Metasoma mostly orange, with tergites V+ ferrugineous. Ovipositor orange, ovipositor sheaths blackish.

Holotype. Female BRASIL, PA, Canindé, Rio Gurupí. IV 1963 Malkin & Pinheiros col.(UFPR)

Comments. All the described species of *Sphelodon* so far have a flagellum with a median whitish band.

Sphelodon n. sp.2

(Figs 2, 8, 11, 16, 21)

Diagnosis. It differs to *S. annulicornis* (Morley, 1914) and *S. wardae* Godoy & Gauld, 2002 in its propodeum characteristics. These two species have a completely delineated area superomedia, while *S.* n. sp.2 has lateromedian longitudinal carina only present anteriorly (i.e. until spiracle level), thus not forming an area superomedia (Fig. 11). It differs from *S. guanacastensis* Godoy & Gauld, 2002 in the mesopleuron. That of *S.* n. sp.2 have some sparse setiferous punctures, while *S. guanacastensis* has a closely and coarsely punctate mesopleuron. It differs from *S. phoxopteridis* (Weed, 1888) in pattern color and in lacking an occipital carina, while in *S. phoxopteridis* the lower end of the occipital carina is present. It differs to *S. ugaldei* Godoy & Gauld, 2002 in pattern color.

Female.

Head: Clypeus 1.3 times as broad as long; lower face with a weak median swelling; malar space 0.8 times as long as basal mandibular width; frons flat and smooth; occipital carina absent; head in dorsal view, with gena very strongly constricted behind eyes, flat. Antenna with 44 flagellomeres, flagellum with a median whitish band between flagellomeres XII and XXI.

Mesosoma: Pronotum long, slightly swollen above upper end of epomia, the epomia itself long and very strong, mesoscutum centrally rather finely and sparsely punctate with hairs, laterally weakly punctulate with setae; notauli present, but weak and shallow; mesopleuron with sparse fine setiferous punctures; epicnemial carina rather straight, not

reaching the anterior margin of mesopleuron and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.2 times as long as the mid coxa. Metapleuron uniformly punctate with hairs, and with a weak to strong stria at the posterior margin of submetapleural carina. Pleural carina complete (Fig. 11); propodeum with posterior transverse carina complete, strong and sinuous, anterior transverse carina, complete and strong, lateral and lateromedian longitudinal carinae present from anterior margin to spiracle level, then with small vestiges (Fig. 11). Fore tibia with spur normally developed, 2.3 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface, and with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 7.6 mm; hind wing length 5.3 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.0 times as long as *Cu*1b*;* hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 16) with tergite I smooth and polished, with lateromedian longitudinal carinae weak, present on anterior 0.2; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along, base with a sharp lateral tooth, which margin points underside (Fig. 21); tergite II 1.1 as long as posteriorly broad, with oblique grooves strongly impressed, with central triangular area smooth and polished, and lateral area smooth with some pubescence; tergites III-IV similar though the latter with the oblique grooves very weak, almost vestigial. Ovipositor of moderate length, 1.6 times as long as hind tibia.

Coloration. Head with face mostly withish with a medium longitudinal brown spot; clypeus withish, mandibles withish with apex brownish; antenna ventrally with margin of scape and pedicel whistish, flagellomeres blackish with flagellomeres XII-XXI white, flagellomeres XI and XXII brownish. Eyes gray, gena, frons black, vertex with two yellowish spots parallel to posterior ocelli and very close to eyes, ocellus light gray; labial and maxilar

palps yellowish. Mesosoma mostly orange, mesoscutum with two ferruginous spots (the submedial one bigger than the posterior one); propleura, mesopleura and metapleura light orange. Wings hyaline with pterostigma brown. Fore legs light orange with tarsus infuscate, mid legs orange, with tarsus brownish, hind legs with coxa, trochanter and trochantellus orange, with tibia orange, with apex ferrugineous; tarsomeres mostly whitish, with basitarse ferrugineous at the base, telotarse mostly ferrugineous. Metasoma orange, with triangular area of tergites II-IV orange ferrugineous. Ovipositor orange; ovipositor sheaths dark brownish, with apex brown.

Holotype. Female BRASIL, SP, Salesópolis, Reserva Biológica Boracéia 23° 39'S 45°53.9'W. Trilha dos Pilões, PT.6 19-22.VI.2002 Bandejas Amarelas APAguiar & ACCMacedo col.BIOTA-FAPESP (MZUSP).**Paratypes.** 2 Females BRASIL, SP, Salesópolis, Reserva Biológica Boracéia 45W 53.9', 23S 39. Trilha dos Pilões, PT.4 (MZUSP).19-22.VI.2002 Bandejas Amarelas APAguiar & ACCMacedo col.BIOTA-FAPESP. 45W 53' 51.4", 23S 39' 03.6". Trilha dos Pilões, PT.3 9-15.I.2003 Malaise 863 m ACCMacedo & JSFreitas col.BIOTA-FAPESP (MZUSP).

Sphelodon n. sp.3

(Figs 3, 6, 7, 12, 17)

Diagnosis. It differs to *S.* n. sp.2, *S.* n. sp.4, *S. guanacastensis*, *S. phoxopteridis*, and *S. ugaldei* in propodeum characteristics. In these species the area superomedia is not delineated. It resembles *S. annulicornis*, *S.* n. sp.1, *S.* n. sp.5, *S. wardae* in having a completely delineated area superomedia (Fig. 12). It differs to *S. annulicornis*, *S.* n. sp.5, and to *S. wardae* in pattern color, to *S.* n. sp.1 in having a median whitish band in the flagellum (Fig. 3).

Female.

Head: Clypeus 1.4 times as broad as long; lower face very weak convex and smooth; malar space 1.0 times as long as basal mandibular width; frons weakly concave and smooth; occipital carina absent (Fig. 6); head in dorsal view, with gena rounded behind eyes. Antenna with 44 flagellomeres, flagellum with a median whitish band between inner side of flagellomeres IX and XX. **Mesosoma:** Pronotum long, not swollen above epomia, the epomia itself strong and long, but not reaching the upper margin of pronotum; mesoscutum punctulate with setae, laterally with punctures finer and weaker; notauli quite strongly impressed anteriorly; mesopleuron mostly smooth, with some setiferous punctures specially at the anterior margin; epicnemial carina rather straight, not reaching the anterior margin of mesopleuron and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.5 times as long as the mid coxa. Metapleuron with some sparse, fine punctures with setae, and with a carina from posterior margin of submetapleural carina to apical margin of metapleuron. Pleural carina complete; propodeum with carinae more or less complete, delineating an enclosed area superomedia; lateral longitudinal carina incomplete (only present anteriorly until spiracle level). Fore tibia with spur normally developed, 1.8 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface, and with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 5.6 mm; hind wing length 4.0 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.1 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 17) with tergite I smooth, with lateromedian longitudinal carinae weak, present on anterior 0.3, tergite I in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along, base with a sharp lateral tooth; tergite II 0.9 as long as posteriorly broad, with oblique grooves strongly impressed, with central triangular area

smooth and polished and lateral area with some fine sparse punctures, tergite III with oblique grooves strongly impressed, with triangular area with some fine punctures, and lateral area with setiferous punctures all over strongly impressed; tergite IV with oblique grooves weaker, with fine setiferous punctures all over. Ovipositor of moderate length, 1.6 times as long as hind tibia.

Coloration. Head: face orange ocher, clypeus orange ocher, mandibles orange ocher with apex reddish ferrugineous, labial and maxilar palps yellowish ocher; vertex and frons blackish centrally, with margins ocher; occiput black; ocelli brownish; gena dorsally blackish, ventrally ocher; eyes mostly blackish, the rest brownish; scape ventrally brownish with margin yellowish pedicel ventrally yellowish; flagellomeres I-VIII dark brownish, flagellomere IX mostly light brownish, flagellomeres X-XX light brownish, flagellomeres XXI + dark brownish. Mesosoma, mesoscutum orange, scutellum and dorsellum light orange; pronotum mostly orange with ventral margin yellowish; mesopleuron mostly yellowish, dorsally orange; metapleuron yellowish, with a mid anterior blackish spot. Wings hyaline with pterostigma dark brown and apex of fore wings with a weak brownish spot. Propodeum ferrugineous, area petiolaris, area posteroexterna, and mostly of area dentipara and area superomedia yellowish, area externa mostly orange. Fore legs with coxa, trochanter light orange, trochantellus mostly orange with an apical brownish spot, femur orange with a basal brownish spot, tibia and tarsus orange; mid legs, coxa light orange, trochanter light orange with two basal brownish spots, trochantellus mostly brownish, femur orange with a basal brownish spot, tibia orange, tarsus brownish; coxa light orange with a big blackish spot at the outer side, and a small dorsal blackish spot at the inner side; trochanter yellow with a dark brown spot in the base, trochantellus mostly brownish, femur mostly orange with a basal blackish spot and a longitudinal brownish strip at the outer side; tibia mostly ferrugineous brownish with a yellow strip at the anterior side, tibial spur brownish ferrugineous, tarsus

mostly brown, tarsomere I with distal half yellowish ocher. Metasoma with tergite I black, anteriorly and posteriorly yellowish; tergite II-IV mostly black, with a posterior yellow strip; tergite V-VI with first half black, last half yellowish, tergite VII yellowish, first half ferrugineous; tergite VIII ferrugineous. Ovipositor orange. Ovipositor sheaths dark brownish.

Holotype. Female, BRASIL, RJ, Teresópolis, Parque Nacional Serra dos Orgãos 42W 56', 22S 26' Armadilha Malaise 43 31.X-05.XI.2004 ALBG Peronti e equipe col. (UFES)

Sphelodon n. sp.4

(Fig. 4, 13, 18, 23)

Diagnosis. It resembles *S.* n. sp.2, *S. guanacastensis*, *S. phoxopteridis* and *S. ugaldei* in not having a delineated area superomedia (Fig. 13). It differs to *S. guanacastensis* in mesopleuron characteristics; this species has a closely and coarsely punctuate mesopleuron. That of *S.* n. sp.4 is rather smooth. It differs to *S. phoxopteridis* in that in this species the lower end of occipital carina is distinct, while in *S.* n. sp.4 it is absent. It differs to *S. ugaldei* in number of flagellomeres (39-40 in *S. ugaldei*, 45 in *S.* n. sp.4). It differs to *S.* n. sp.2 in pattern color. It differs to *S. annulicornis*, *S.* n. sp.1, *S.* n. sp.5, and *S. wardae* in that these species have a completely delineated area superomedia.

Female.

Head: Clypeus 1.5 times as broad as long; lower face with a weak median swelling; malar space 0.7 times as long as basal mandibular width; frons flat and smooth; occipital carina absent; head in dorsal view, with gena rounded behind eyes. Antenna with 45 flagellomeres, flagellum with a median whitish band between flagellomeres XIII and XXII.

Mesosoma: Pronotum long, not swollen above epomia, the epomia itself strong and long, but not reaching the upper margin of pronotum; mesoscutum uniformly punctulate with setae; notauli weakly impressed anteriorly; mesopleuron with setiferous punctures at ventral and anterior margins; epicnemial carina weakly impressed, something sinuous at dorsal margin, not achieving the anterior margin of mesopleuron, and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.4 times as long as the mid coxa. Metapleuron punctulate with setae, and with a transverse stria at posterior margin of submetapleural carina. Pleural carina complete (Fig. 13); propodeum with posterior transverse and anterior transverse carinae present, lateral longitudinal carina present anteriorly until spiracle level, and lateromedian longitudinal carina present anteriorly until joining anterior transverse carina (Fig. 13). Fore tibia with spur normally developed, 2.9 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface, and with spurs nearly equal, the longer 1.1 times the length of the shorter. Fore wing length 6.7 mm; hind wing length 4.7 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.0 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*. **Metasoma** (Fig. 18) with tergite I smooth with some small setiferous punctures, with lateromedian longitudinal carinae very weak, in dorsal view with vestiges present until 0.83; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along, base with a sharp lateral tooth, which apex points underside (Fig. 23); tergite II 1.2 as long as posteriorly broad, with oblique grooves strongly impressed, with some few sparse setiferous punctures in the central triangular and lateral areae; tergites III-IV similar though the latter with the oblique grooves weak and with more setiferous punctures than in tergite III.

Coloration. Head: Face yellow with apex brownish ferrugineous, vertex brownish ferrugineous, clypeus, mandibles with two yellow spots parallel to ocelli close to eyes, ocelli

dark orange, frons mostly ferruginous brownish with two lateral strips close to eyes, eyes brown with black spots; scape and pedicel ventrally yellow, dorsally yellowish infuscate. Flagellomere I, brownish with outer side with an orange strip; flagellomeres II – XII Brown, flagellomere XIII mostly yellowish; flagellomeres XIV –XXII yellowish; flagellomeres XXIII+ Brown. Gena dorsally ferrugineous brown, ventrally yellow. Maxilar palps and labial orange. Mesosoma orange.; propleuron, mesopleuron and metapleuron light orange. Wings hyaline with pterostigma brown. Fore legs orange, mid legs orange with tarsomeres brown; hind legs, coxa, trochanter, trochantellus, femur orange, tibia mostly orange with apex ferruginous, tarsomeres mostly yellowish, tarsomere I with base half ferruginous, tarsomere V ferruginous. Metasoma with tergites I –III dark orange, tergites IV + ferruginous.

Holotype. Male. BRASIL: Santa Catarina, Nova Teutônia, 52W 25'27", 27 S 09'49", IX/1967 F.Plaumann leg. (UFPR).

Sphelodon n. sp.5

(Figs 5, 9, 14, 19, 22)

Diagnosis. It resembles *S. annulicornis*, *S.* n. sp.1, and *S. wardae* in having a completely delineated area superomedia (Fig. 14). It differs to *S. annulicornis* in number of flagellomeres and pattern color (39-40 flagellomeres in *S. annulicornis*, 43 in *S.* n. sp.5), to *S.* n. sp.1 in the color of the flagellum, differs to *S. wardae* in pattern color. It differs to *S.* n. sp.2, *S. guanacastensis*, *S. phoxopteridis* and *S. ugaldei* in that these species do not have a delineated area superomedia.

Female.

Head: Clypeus 1.3 times as broad as long; lower face very weak convex and smooth; malar space 0.8 times as long as basal mandibular width; frons flat and smooth;

occipital carina more or less entirely absent, with a short vestige laterally; Head in dorsal view, with gena rounded behind eyes. Antenna with 43 flagellomeres, flagellum with a median whitish band between flagellomeres X and XIX.

Mesosoma: Pronotum long, not swollen above epomia, the epomia itself strong but short, not reaching the upper margin of the pronotum; mesoscutum punctulate with setae, laterally with punctures finer and weaker; notauli present, but weak and shallow; mesopleuron mostly punctulate with setae; epicnemial carina rather sinuous, achieving the anterior margin of mesopleuron and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.3 times as long as the mid coxa. Metapleuron punctulate with setae, and with a transverse carina at posterior margin of submetapleural carina. Pleural carina complete and strong (Fig. 14); propodeum with carinae almost complete, delineating an enclosed area superomedia; lateral longitudinal carina present on anterior margin until anterior transverse carina; posterior transverse carina sinuous, forming a "*M*" (Fig. 14). Fore tibia with spur normally developed, 1.4 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface, and with spurs nearly equal, the longer 1.1 times the length of the shorter. Fore wing length 6.1 mm; hind wing length 3.5 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.5 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.4 times as long as the combined lengths of this vein and *cu-a*.

Metasoma (Fig. 19) with tergite I smooth with some setiferous punctures, with lateromedian longitudinal carinae very weak, in dorsal view present on anterior 0.2; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; base with a rather truncated lateral tooth, which apex points underside (Fig. 22); tergite II 1.0 as long as posteriorly broad, with oblique grooves strongly impressed, with a central triangular area smooth and polished and lateral area similar but with some isolated setae; tergites III-IV

similar though the latter with the oblique grooves weaker, with some setae specially in the lateral area. Ovipositor of moderate length, 1.9 times as long as hind tibia.

Coloration. Head: Face light yellow with a central longitudinal brown spot, clypeus and mandible light yellow, apex of mandibles ferruginous, labial and maxilar palps light yellow; frons, vertex and occiput centrally brownish ferruginous, light yellow laterally; ocelli brownish ferruginous; gena mostly light yellow. Eyes dark brownish. Antenna, scape brownish with margin yellowish, pedicel yellowish. First flagellomere brownish, flagellomeres II-VIII dark brown, flagellomere IX mostly dark brown, flagellomeres X-XVIII whitish, flagellomere XIX mostly whitish, flagellomeres XX+ dark brownish. Mesosoma: mesoscutum reddish, scutellum yellow, dorsellum yellow; pronotum mostly yellow with dorsal and ventral margins yellow; mesopleuron yellow centrally, reddish epicnemium, dorsal margin and posterior margin; metapleuron mostly yellow, subalar prominence and tegula yellow. Wings hyaline, pterostigma brown. Propodeum mostly reddish with yellow spots in area dentipara. Fore legs: coxa, trochanter, trochantellus light yellow; femur tibia and tarsus orange; mid legs, coxa, trochanter light yellow, trochantellus mostly light yellow with a marginal brownish ferrugineous spot; femur and tibia orange; tarsomeres brownish; hind legs coxa yellowish with an inner and a outer ferrugineous spot, trochanter basal half ferrugineous, the rest yellow, trochantellus with apex ferrugineous, femur with inner side orange, outer side dark orange; tibia brownish with base and apex ferrugineous; tarsus mostly whitish; tarsomere I with base ferrugineous, telotarsus ferrugineous. Metasoma with tergite I ferruginous with anterior and posterior margins yellow; tergite II-III ferruginous with anterior corners and posterior margin yellow; tergite IV mostly ferruginous, the rest light yellow; tergite V light yellow, basal half ferruginous; tergites VI-VII light yellow with anterior margin with a ferruginous strip. Ovipositor orange, ovipositor sheaths dark brown.

Holotype. Female BRASIL, SÃO PAULO, Botucatu, 48W 26' 41", 22S 53' 07", VIII, 1986, 804 m, H.C.Almeida col. (UFPR).

Key to Brazilian species of *Sphelodon*

1. Flagellum without a median whitish band (Fig.1)……..……***Sphelodon.* n. sp.1**

- Flagellum with a median whitish band (Figs 2-5)…….....……...2

2. Propodeum not delineating an enclosed area superomedia (Figs 11, 13)…...……3

- Propodeum delineating an enclosed area superomedia (10, 12, 14)……..…...4

3. Propodeum with posterior transverse and anterior transverse carinae normally developed and rather straight (Fig. 13). Triangular area of tergite II with some punctures (Fig. 18)..... ……...…….....***Sphelodon* n. sp.4**

- Propodeum with posterior transverse carina complete, strong and sinuous, anterior transverse carina, complete and strong (Fig. 11). Triangular area of tergite II smooth and polished (Fig. 16)….…….....…….....***Sphelodon* n. sp.2**

4. Antenna with 39-40 flagellomeres. Mesosoma mostly black. Triangular area of tergite II smooth……..……***Sphelodon annulicornis*** Morley, 1914

- Antenna with 43 or more flagellomeres. Mesosoma mostly orange or reddish. Triangular area of tergite II smooth and polished (Figs 17, 19)…….…….....5

5. Lateral area of tergite II with some sparse punctures (Fig. 17). Propodeum with area petiolaris, area posteroexterna, and mostly of area dentipara and area superomedia yellowish; area externa mostly orange, rest of propodeum dark ferrugineous; apex of fore wings with a weak brownish spot (Fig. 3)…….…….....***Sphelodon* n. sp.3**

- Lateral area of tergite II different (smooth with some pubescence) (Fig. 19). Propodeum mostly reddish with yellow spots in area dentipara; fore wings hyaline (Fig. 5).....

…….....……..***Sphelodon* n. sp.5**

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RESUMO

Cinco espécies novas do gênero *Sphelodon* Townes 1966 são descritas e ilustradas de várias regiões do Brasil. É fornecida uma chave de identificação para as espécies brasileiras.

Palavras chave: Vespas, Glyptini, América do Sul, chave de identificação, taxonomia.

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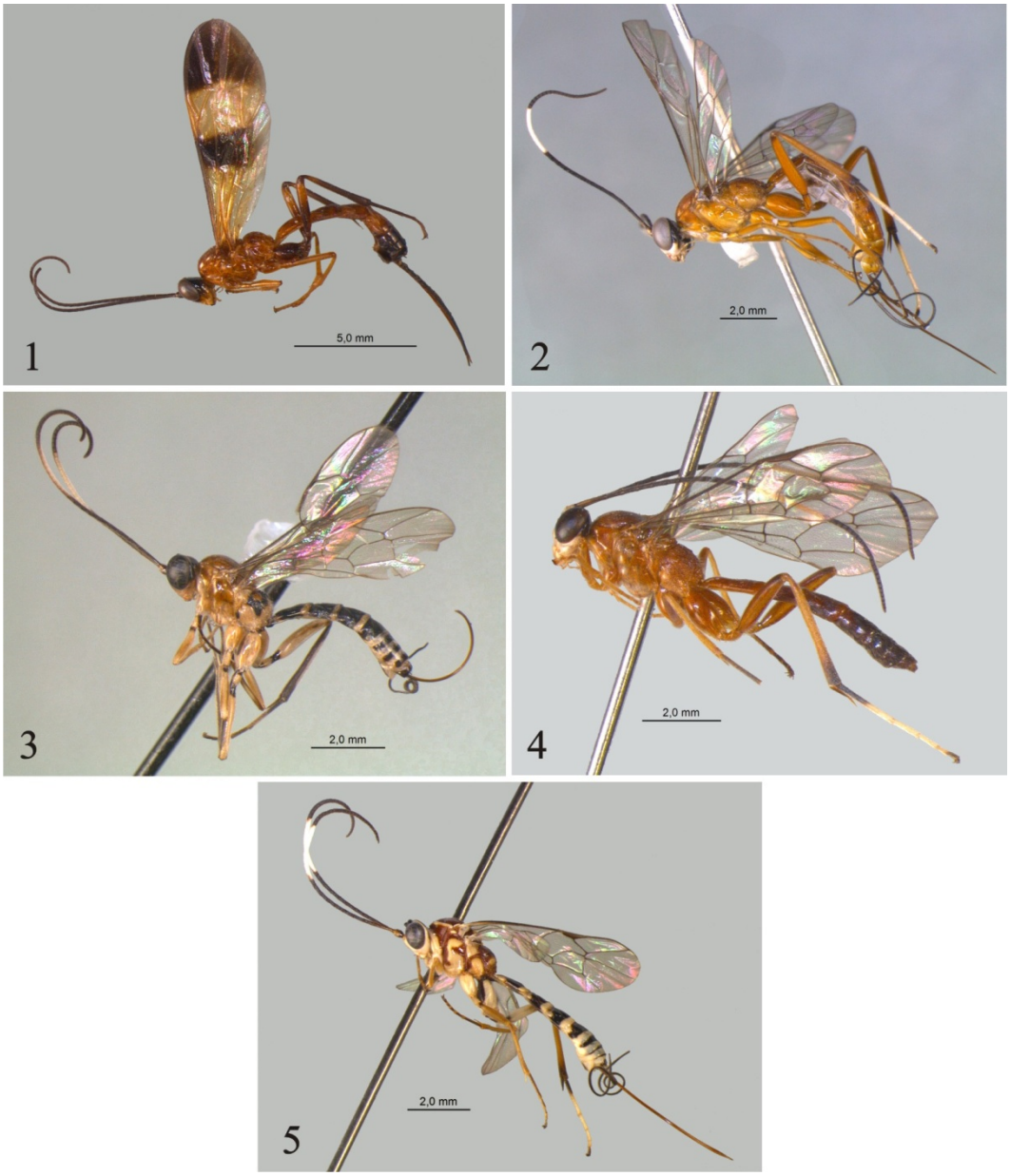
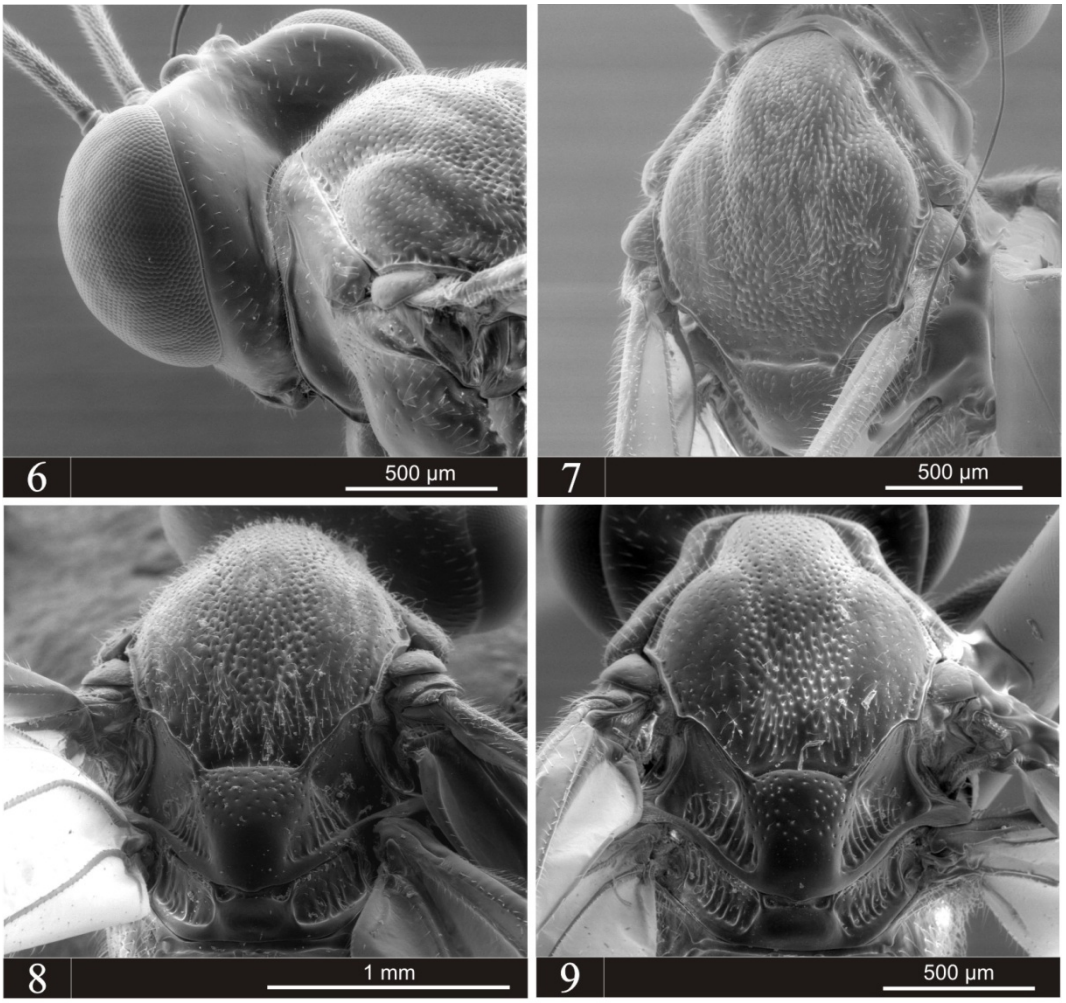
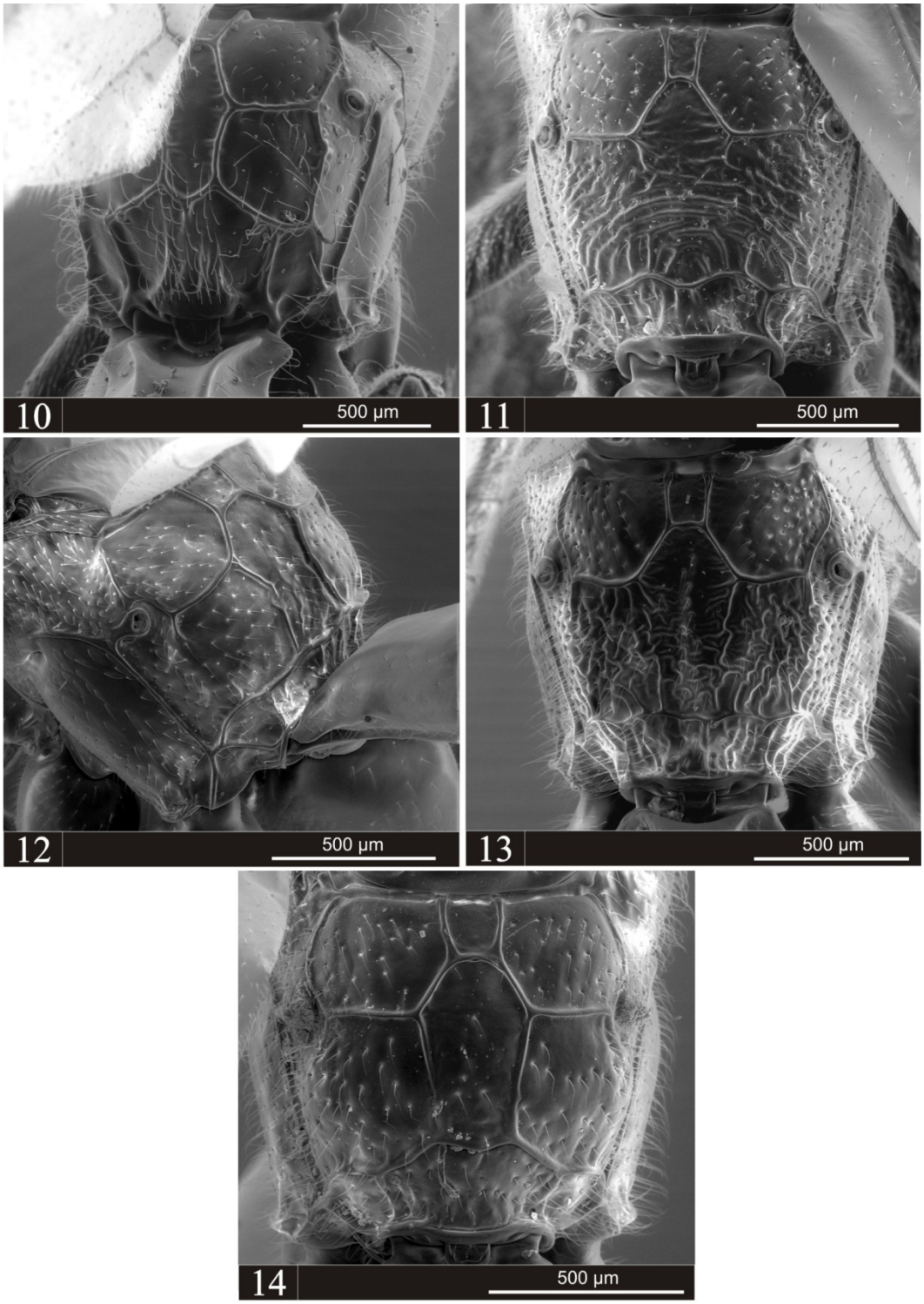
Figures



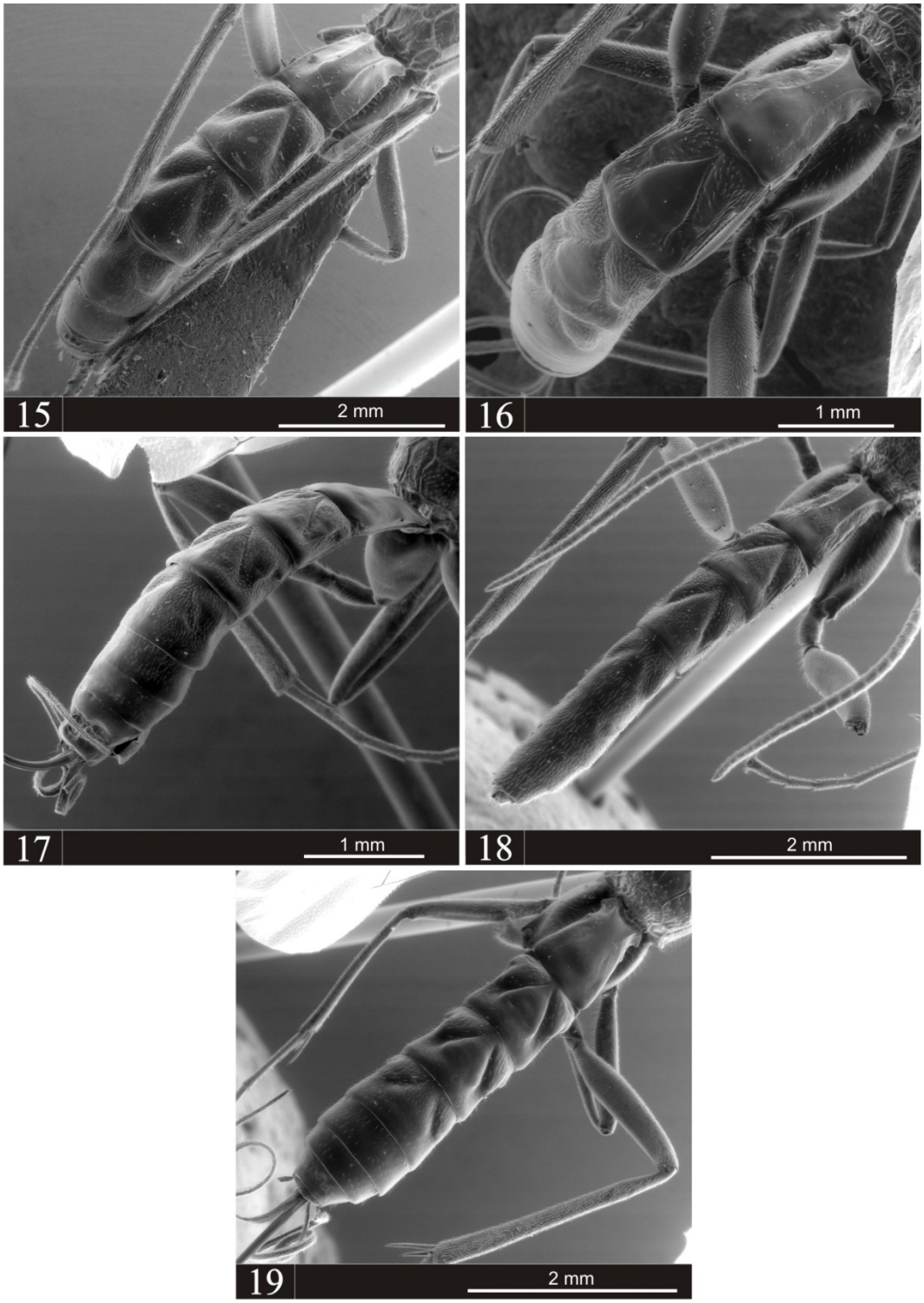
Figs 1-5. *Sphelodon* spp., habitus; 1, *Sphelodon* n. sp.1; 2, *S.* n. sp.2 ; 3, *S.* n. sp.3; 4, *S.* n. sp.4; 5, *S.* n. sp.5.



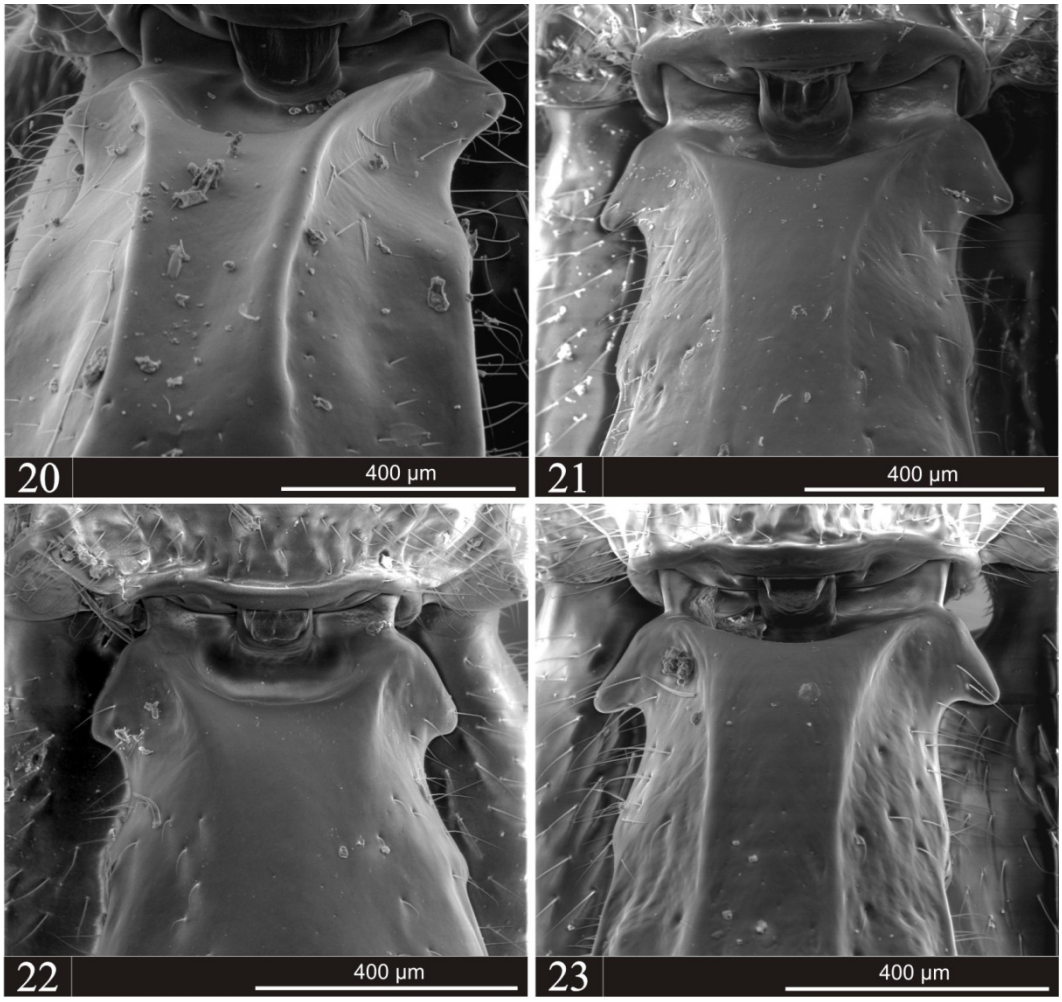
Figs 6-9. Stereoscan photographs of *Sphelodon* spp.. Fig. 6, *S.* n. sp.3, Head (posterior), and anterior part of mesoscutum. Figs 7-9. Mesoscutum; 7, *S.* n. sp.3 ; 8, *S.* n. sp.2; 9, *S.* n. sp.5.



Figs 10-14. Stereoscan photographs of *Sphelodon* spp., propodeum; 10, *S.* n. sp.1; 11, *S.* n. sp.2; 12, *S.* n. sp.3; 13, *S.* n. sp.4; 14, *S.* n. sp.5.



Figs 15-19. Stereoscan photographs of *Sphelodon* spp., metasoma; 15, *S.* n. sp.1; 16, *S.* n. sp. 2; 17, *S.* n. sp.3; 18, *S.* n. sp.4; 19, *S.* n. sp.5.



Figs 20-23. Stereoscan photographs of *Sphelodon* spp., tergite I; 20, *S.* n. sp.1; 21, *S.* n. sp.2; 22, *S.* n. sp.5; 23, *S.* n. sp.4.

4.4.5 New species of *Glypta* (Hymenoptera: Ichneumonidae) from Brazil

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Abstract

Three new species of the genus *Glypta* are described and illustrated from Brazil. An identification key to the Brazilian species is provided.

Introduction

Glypta Gravenhorst, 1829 is a very large genus of the tribe Glyptini (Ichneumonidae: Banchinae) with Holarctic, Neotropical and Oriental distribution; most of the species (311) occur in the Nearctic Region (YU&HORSTMANN,1998; YU *et al*., 2005); 19 species have been recorded from the Neotropical region, 15 species so far only registered in Costa Rica (GAULD *et al*., 2002), *G. humilis* Spinola, 1851 and *G. rufipes* Spinola, 1851 from Chile, *G. rufomarginata* Cameron,1886 from México, and *G. rufiscutellaris*, an introduced Nearctic species, from Argentina and Uruguay as a biological control of *Grapholita molesta* (Busck,1916) (Lepidoptera: Tortricidae) (TOWNES & TOWNES, 1966;

YU & HORSTMANN, 1998; YU *et al*., 2005). None of the tropical species have been reared. Nevertheless, the main focus of hosts for *Glypta* seems to be microlepidopterous larvae living in weak concealment, especially the Tortricidae. (DASCH, 1988; GAULD *et al*., 2002). There are also, some records from the coleopterous families Cerambycidae, Scarabaeidae and Rhynchophora and from the hymenopterous families Cephidae and Diprionidae. These hosts are mainly leafrollers or borers in stems or buds (DASCH, 1988).

Three new species from Brazil are keyed and described here, all of them belonging to the *eberhardi* species-group, characterized by having the propodeum with a distinctly delineated area superomedia and area dentipara (GAULD *et al*., 2002).

Material and methods

The material included in this revision was obtained in the main entomological collections of the Southeast and South of Brazil: Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos, São Carlos, SP, Brasil (DCBU), Universidade Federal de Paraná (UFPR), Museu de Zoologia Universidade de São Paulo (MZUSP), Universidade Federal de Espírito Santo (UFES), Universidade Federal de Rio de Janeiro (UFRJ), Coleção Entomológica Instituto Oswaldo Cruz (CEIOC) and material from the Project Biota Noroeste UNESP São José de Rio Preto (UNESP-SJRP). Type material was not available to us, the species treated in this study were identified using the keys of GAULD *et al*. (2002) or through comparison with the original descriptions. Spinola (1851), Cameron (1886) and Cresson (1870) provided comprehensive information; data from those works have been added here.

The nomenclatural treatment, morphological terminology and taxonomic characters used here follow GAULD (1991) and GAULD *et al*. (2002).

Results

Glypta new species 1

(Figs 1, 4-9)

Specimens examined: *Holotype* (female) Brasil, ES, Castelo, Parque Ecológico Forno Grande 41 W 02', 20S 31' Varredura, 14.X.2000 C.O. Azevedo col (UFES)

Diagnosis.

It distinguishes from *Glypta sanvita* Godoy & Gauld, 2002 in carinae of propodeum, delineating only an enclosed area superomedia and area dentipara in *G. sanvita* and carinae delineating enclosed areae externa, basalis, dentipara, superomedia, spiracularis and lateralis in *G.* new species 1 (Fig. 7); they also differ in the occipital carina. In *G. sanvita* the lower end of occipital carina reaches hypostomal carina at base of mandible, while in *G.* new species 1 only a lateral vestige of occipital carina is present, and it doesn't reach the lower margin (i.e. it doesn't reach neither the mandibular base nor hypostomal carina) (Figs 4, 5). It differentiates to *G. rufipes* Spinola, 1851 and *G. humilis* Spinola, 1851 from Chile and *G. rufomarginata* Cameron, 1886 from Mexico in pattern color: the flagellum of *G. rufipes* is black with a white ring, that of *G. humilis* is brown with the two first flagellomeres black, that of *G. rufomarginata* is black while in *G.* new species 1 it is uniformly brown. Also tells apart to *G. rufiscutellaris* Cresson, 1870, Nearctic species introduced in Uruguay and Argentina, in frons and propodeum characteristics, and also in pattern color (e.g. most of mesosoma fuscous in the exotic species, mostly orange in *G.* new species 1).

Description.

Head: Clypeus in anterior view 1.9 times as broad as long; lower face with a median vertical swelling; malar space 1.1 times as long as basal mandibular width; frons flat,

with sparse setiferous punctures. Occipital carina dorsally entirely absent (Fig. 4). Head in dorsal view, with gena rounded behind eyes. Antenna incomplete.

Mesosoma: Pronotum with epomia strong medially, not reaching dorsal margin of notum; mesoscutum smooth with some setiferous punctures; notauli weakly impressed anteriorly, very short; mesopleuron smooth with setiferous punctures more concentrated at the anterior margin; epicnemial carina strongly impressed, something sinuous at its dorsal margin, and exceeding the level of lower corner of pronotum; sternal part of mesothorax 1.3 times as long as the mid coxa; metapleuron with some sparse setiferous punctures, and with three longitudinal striae at its apical margin. Pleural carina complete and strong (Fig. 5). Propodeum with transverse and longitudinal carinae delineating enclosed areae externa, basalis, dentipara, superomedia, spiracularis and lateralis (Fig. 7). Fore tibia with spur normally developed, 1.6 times as long as breadth of tibia, mid tibia with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 4.3 mm; hind wing length 3.1 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.5 times as long as *Cu*1b. Hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*; distal abscissa de *Cu*1 entirely absent, not even represented by a slight bend in *Cu*1 *& cu-a*, which is a little sinuous (Fig. 6).

Metasoma with tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along (Fig. 8); lateromedian longitudinal carina strong, reaching about 0.9 of length of tergite; tergite II 0.8 times as long as posteriorly broad with deeply very impressed oblique grooves (Figs 8, 9); the entire tergite with lateral area punctate, central triangular area smooth (Figs 8, 9); tergites III-IV similar, although tergite IV with weaker impressed oblique grooves; tergites V+ alutaceous (Fig. 8). Ovipositor of moderate length, 1.7 times as long as hind tibia.

Color

Head black, clypeus, mandible, labial and maxilar palps yellow, apex of mandibles ferruginous; eyes brown, ocelli brown, antena brown. Mesosoma mostly orange, scutellum most of pronotum, subalar prominence and tegula yellow. Wings infumate, pterostigma brown. Propodeum orange with area externa, area dentipara and area petiolaris ferruginous. Fore leg orange with coxa, trochanter, trochantellus and part of femur pale yellow; mid leg with coxa and trochanter yellow; trochantellus mostly pale yellow with apex infuscate; femur yellow with base infuscate, tibia mostly orange with apex brownish; tarsus orange with fifth tarsomere dark brown. Hind leg with coxa, trochanter yellow, trochantellus dark brown, femur yellow with base dark brown, apex brown, tibia yellow with subbasal and apical brown spot; tarsus brown. Metasoma with tergite I-III dark ferruginous; tergite IV + ferrugineous. Ovipositor orange with sheaths ferruginous.

***Glypta* new species 2**

(Figs 2, 10-17)

Specimens examined

Holotype (female) Brasil, SÃO PAULO, Santa Rita do Passa Quatro, Mata Capitinga-Vassununga, 47W 37’13”, 21S 40’56”, 29.XII.2006. Armadilha Malaise. A.M.P.Dias col. (DCBU).

Diagnosis

It differs from *Glypta sanvita* in carinae of propodeum, delineating only an enclosed area superomedia and area dentipara in *G. sanvita* and delineating areae externa, basalis, dentipara and superomedia, in *G.* new species 2 (Fig. 15); also they differ in number

of flagellomeres (32 in *G. sanvita*, 37 in *G.* new species 2. It can be differentiated from *G. rufipes* and *G. humilis* from Chile and *G. rufomarginata* from Mexico because its pattern color: the flagellum of *G. rufipes* is black with a white ring, that of *G. humilis* is brown with the two first flagellomeres black, that of *G. rufomarginata* is black while in *G.* new species 2 it is uniformly dark brown. Also differentiates to *G. rufiscutellaris*, Nearctic species introduced in Uruguay and Argentina, in frons and propodeum characteristics, in pattern color (e.g. most of mesosoma fuscous in the exotic species, mostly orange in *G.* new species 2), and in number of flagellomeres (28-34 in *G. rufiscutellaris*, 37 in *G.* new species 2).

Description

Head: Clypeus in anterior view 1.8 times as broad as long (Fig. 10). Lower face with a median vertical swelling; malar space 1.1 times as long as basal mandibular width (Fig. 10). Frons flat, with close punctures. Occipital carina dorsally entirely absent (Fig. 11); lower end of occipital carina reaching hypostomal carina at base of mandible (Fig. 11, 12). Head in dorsal view, with gena constricted behind eyes, rather flat. Antenna with 37 flagellomeres.

Mesosoma: Pronotum with epomia weakly developed, its upper end sharp, but not tuberculate, and not reaching dorsal margin of notum (Fig. 11); mesoscutum smooth with some setiferous punctures anteriorly; notauli moderately impressed anteriorly, rather short; mesopleuron with setiferous punctures on anterior and ventral margins; epicnemial carina moderately impressed, sinuous dorsally, and exceeding the level of lower corner of pronotum. Sternal part of mesothorax 1.6 times as long as the mid coxa; metapleuron punctate with hairs (more conspicuous at dorsal margin), and a transverse stria at anterior margin of submetapleural carina, a longitudinal carina from apical margin of submetapleural carina to the posterior margin of metapleuron, where there are also three other transverse striae. Pleural carina complete (Fig. 15); propodeum with transverse and longitudinal carinae more or less complete, delineating areae externa, basalis, dentipara and superomedia (Fig. 15). Fore tibia

with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia with spurs nearly equal, the longer 1.0 times the length of the shorter. Fore wing length 4.7 mm; hind wing length 3.1 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.5 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.9 times as long as the combined lengths of this vein and *cu-a* (Fig. 13); distal abscissa de *Cu*1 almost completely absent but its position discernible from a distinct but small basal vestige in *Cu*1 & *cu-a* (Figs 13, 14).

Metasoma: Tergite I with lateromedian longitudinal carina moderately strong, reaching about 0.6 of length of tergite, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along (Fig. 16); tergite II 0.8 times as long as posteriorly broad, with deeply very impressed oblique grooves, the entire tergite with lateral area closely punctate, central area with some sparse punctures (Fig. 17); tergites III-IV similar; tergite V+ alutaceous (Fig. 17). Ovipositor of moderate length, 2.3 times as long as hind tibia.

Color

Head black with clypeus, mandible maxilar and labial palps light orange with apex brownish. Eyes brown. Ocelli brown. Antenna dark brown. Pedicel brown, mesosoma orange, pronoto yellowish in part. Scutellum yellowish. Wings hyaline, pterostigma dark brown. Propodeum with blackish spots at area externa, area petiolaris. Fore legs with coxa, trochanter, trochantellus light yellow; femur, tibia orange, tarsus dark orange; mid leg with coxa, trochanter, trochantellus yellow; femur orange with basal blackish spot, tibia orange with apical brownish spot, tarsus dark brown; hind legs, coxa light yellow with ventral inner brownish spot, trochanter orange, trochantellus mostly dark brown, femur orange, with basal and apical dark brown spots, tibia yellowish with subbasal and apical ferruginous spots; tarsus ferruginous, tarsomere I with base orange. Metasoma ferruginous. Ovipositor orange, ovipositor sheaths blackish.

Glypta new species 3

(Figs 3, 18-23)

Specimens examined

Holotype (female) Brasil: SÃO PAULO Iperó, Flona de Ipanema, Morro Aracoiaba- Trilha caminho da Cobra Ponto 3, Malaise, 47W 37 ' 07.2 " , 23S 27 ' 01.7", 833 m, 17.IX-24.X.2007 Arouca e equipe col (DCBU).

Diagnosis

It differs from *Glypta sanvita* in carinae of propodeum, delineating only an enclosed area superomedia and area dentipara in *G. sanvita* and delineating areae externa, basalis, dentipara and superomedia in *G.* new species 3 (Fig. 21). It distinguishes to *G. rufipes* and *G. humilis* from Chile and *G. rufomarginata* from Mexico in pattern color: the flagellum of *G. rufipes* is black with a white ring, that of *G. humilis* is brown with the two first flagellomeres black, that of *G. rufomarginata* is black while in *G.* new species 3 it is dark brown. Also, it can be differentiated to *G. rufiscutellaris*, Nearctic species introduced in Uruguay and Argentina, in frons and propodeum characteristics, and also in pattern color (e.g. most of mesosoma fuscous in the exotic species, mostly orange in *G.* new species 3).

Description

Head: Clypeus in anterior view 1.5 times as broad as long; lower face with a quite strongly rounded median swelling; malar space 0.9 times as long as basal mandibular width; frons flat, with sparse setiferous punctures. Occipital carina dorsally entirely absent (Fig. 18). Lower end of occipital carina reaching hypostomal carina at base of mandible (Figs 18, 19). Head in dorsal view, with gena rounded behind eyes. Antenna with 33 flagellomeres.

Mesosoma: Pronotum with epomia weakly developed, not reaching dorsal margin of notum; mesoscutum smooth and polished with some small setiferous punctures; notauli very weakly impressed anteriorly, very short; mesopleuron polished with setiferous punctures at anterior and ventral margins; epicnemial carina weakly impressed, sinuous medially and exceeding the level of lower corner of pronotum. Sternal part of mesothorax 1.2 times as long as the mid coxa; metapleuron punctate with hairs (more conspicuous at dorsal margin), and a transverse stria at anterior margin of submetapleural carina, a longitudinal carina from apical margin of submetapleural carina to the posterior margin of metapleuron, where there are also three other transverse striae. Pleural carina complete (Fig. 21); propodeum with transverse and longitudinal carinae more or less complete, delineating areae externa, basalis, dentipara and superomedia (Fig. 21). Fore tibia with spur normally developed, 1.4 times as long as breadth of tibia; mid tibia with spurs nearly equal, the longer 1.1 times the length of the shorter. Fore wing length 4.1 mm; hind wing length 3.1 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.5 times as long as *Cu*1b. Hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.9 times as long as the combined lengths of this vein and *cu-a* (Fig. 20); distal abscissa de *Cu*1 absent, but its position discernible by a slight bend in *Cu*1 *& cu-a* (Fig. 20).

Metasoma with tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along (Fig. 22); lateromedian longitudinal carina moderately strong, reaching about 0.8 of length of tergite; tergite II 0.9 times as long as posteriorly broad, with deeply very impressed oblique grooves, the entire tergite with lateral area punctate, central area smooth with some setiferous punctures (Fig. 23); tergites III-IV similar, with central area progressively with more setiferous punctures; tergite V+ alutaceous (Fig. 22). Ovipositor of moderate length, 2.8 times as long as hind tibia.

Color

Head black, clypeus, mandible, maxilar and labial palps yellow, apex of mandibles reddish. Eyes brown, ocelli brown, antenna dark brown, pedicel yellowish. Mesosoma orange, propleuron yellow. Wings infuscate, pterostigma brown. Propodeum with ferruginous spots at area externa and area petiolaris. Fore legs orange with coxa, trochanter and trochantellus pale yellow; mid leg, coxa, trochanter, trochantellus yellow; femur orange, tibia orange with apex brownish, tarsus brownish, tarsomere I basally orange. Hind leg, coxa light orange with ventral brownish spot, trochanter mostly light orange, trochantellus dark brown, femur mostly orange with basal and apical brownish spots, tibia light yellowish with subbasal and apical dark brown strips, tibial spurs yellow, tarsus dark brown. Metasoma reddish brown, ovipositor orange, ovipositor sheaths blackish.

Key to *Glypta* species ocurring in Argentina, Brazil and Uruguay

1. Frons with several fine arcuate carinulae above antennal fossae and a pair of weak vertical carinulae between antennal fossae, closely punctate; propodeum lacking median portion of anterior transverse carina.…….***Glypta rufiscutellaris*** Cresson, 1870 [Introduced into Argentina and Uruguay]

- Frons more or less flat, sparsely punctate; propodeum with anterior transverse carina complete…….....2

2. Occipital carina laterally does not reach the lower margin of the head (Figs 4, 5).....…….....…….***Glypta* new species 1**

- Occipital carina laterally reaching hypostomal carina at base of mandible (Figs 11, 12, 18, 19) …….....…… 3

3. Hind wing with distal abscissa de *Cu*1 almost completely absent but its position discernible from a distinct but small basal vestige in *Cu*1 & *cu-a* (Figs 13, 14); antenna with 37 flagellomeres; fore tibia with spur 2.2 times as long as breadth of tibia; tergite II 0.8 times as long as posteriorly broad (Figs 16,17). ……..***Glypta*** **new species 2**

- Hind wing with distal abscissa de *Cu*1 absent, but its position discernible by a slight bend in *Cu*1 *& cu-a* (Fig. 20); antenna with 33 flagellomeres; fore tibia with spur 1.4 times as long as breadth of tibia; tergite II 0.9 times as long as posteriorly broad (Figs 22, 23) .....…….....***Glypta*** **new species 3**

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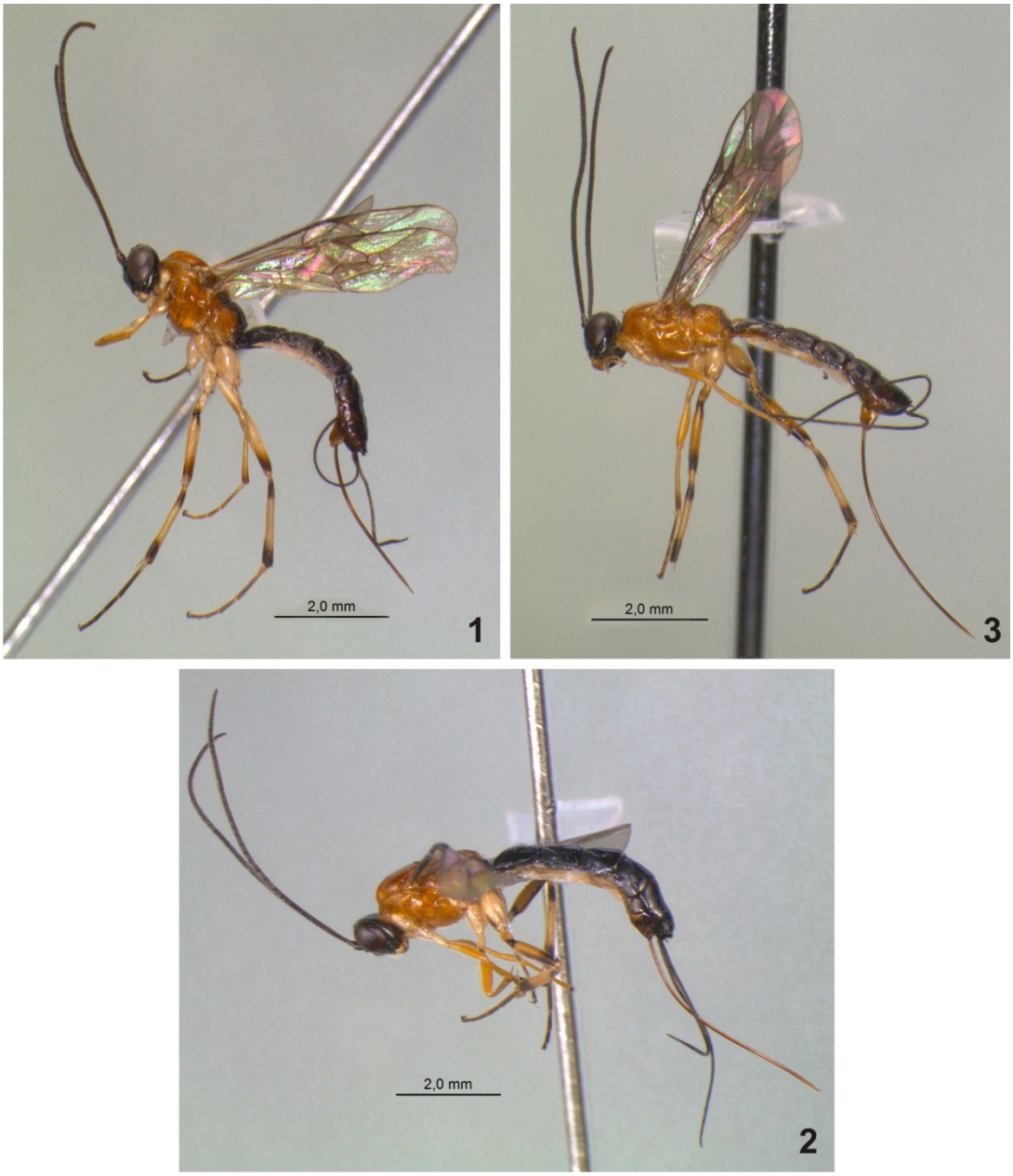
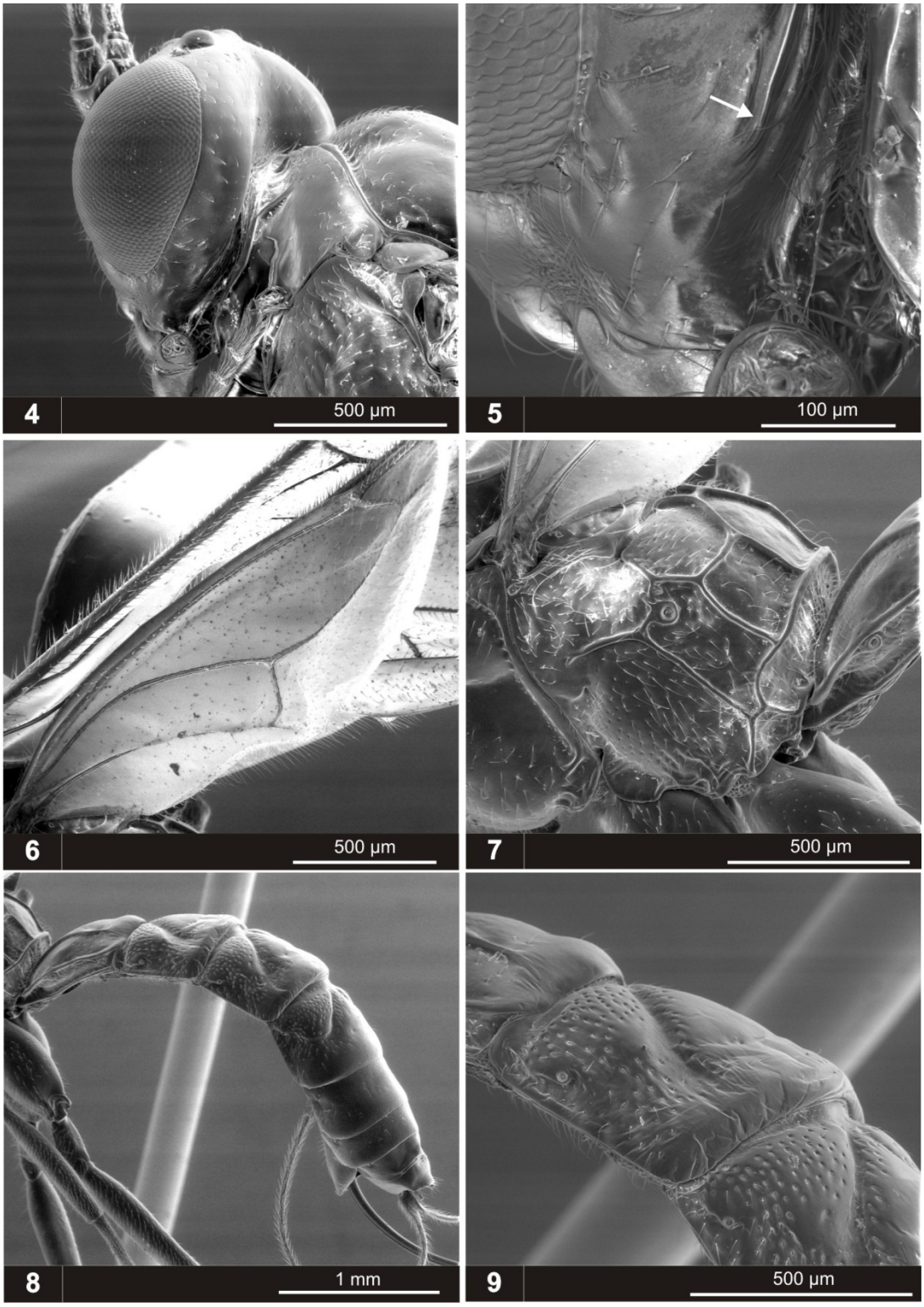
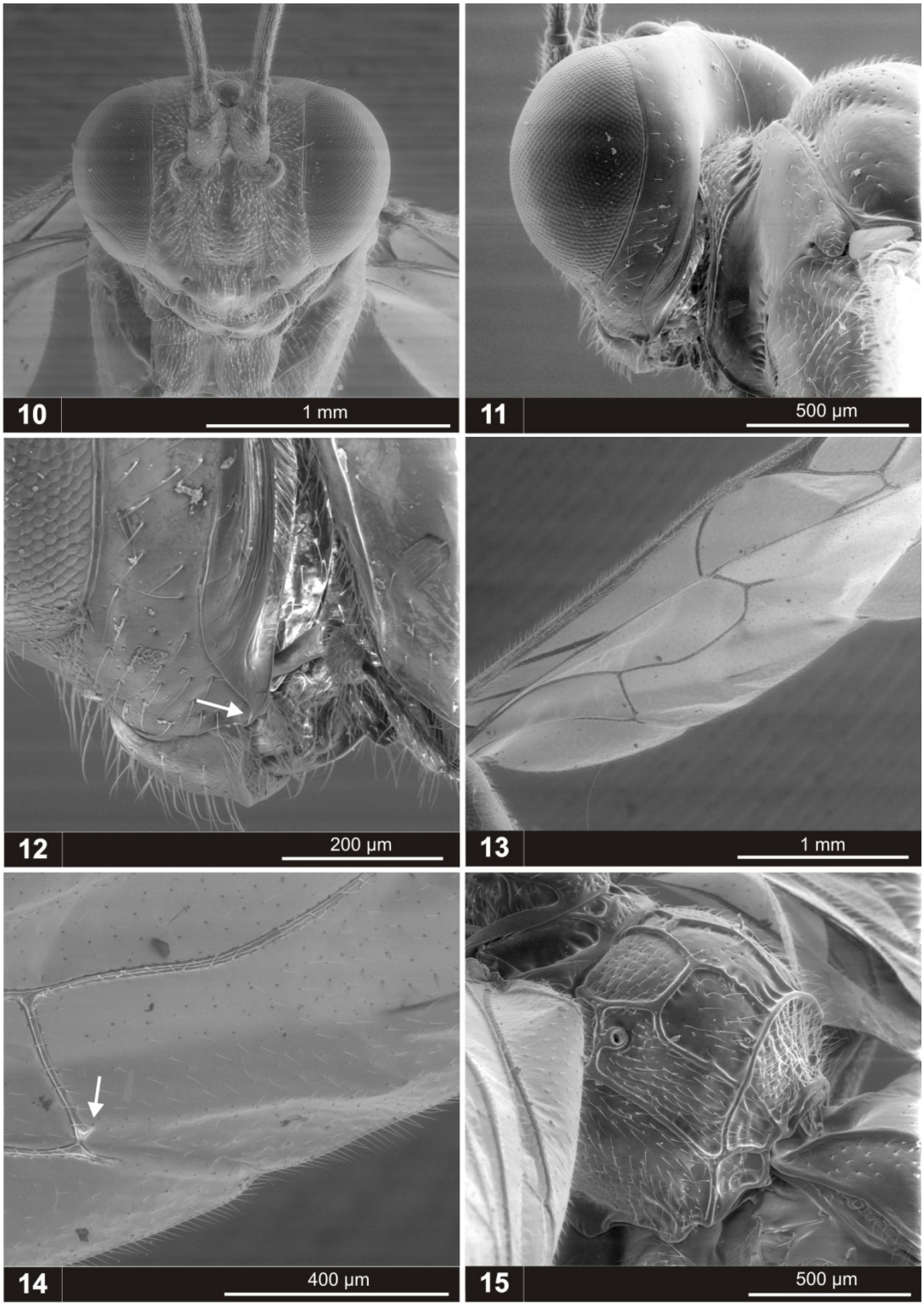
Figure Legends



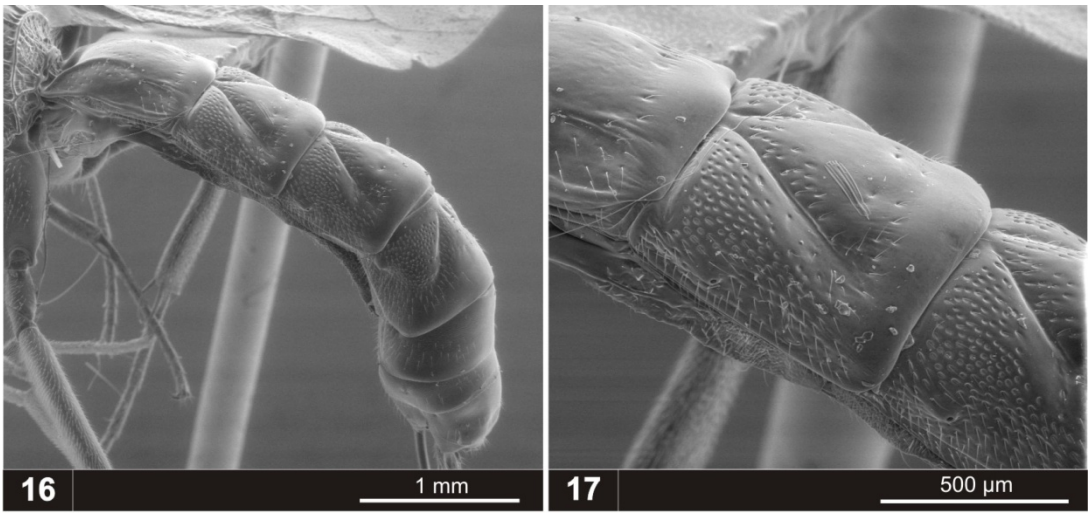
Figs 1-3. *Glypta* spp., habitus; 1, *Glypta* new species 1; 2, *Glypta* new species 2 ; 3, *Glypta* new species 3.



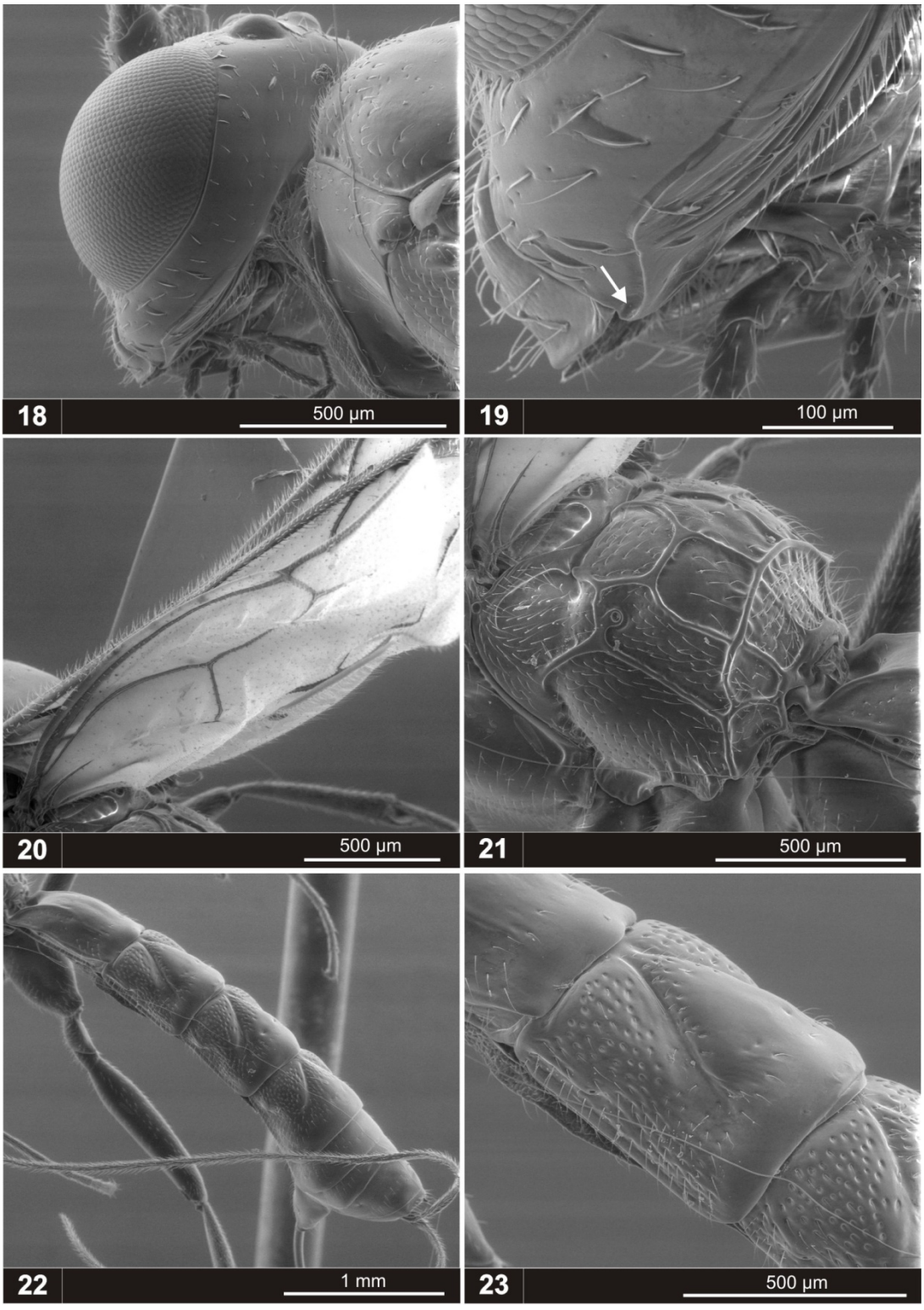
Figs 4-9. Stereoscan photographs of *Glypta* new species 1; 4, head, posterolateral; 5, detail of head (arrow indicates occipital carina); 5, hind wing; 7, propodeum; 6, metasoma; 7, tergite II.



Figs 10-15. Stereoscan photographs of *Glypta* new species 2. Figs 10-12. Head; 10, frontal; 11, posterolateral; 12, detail (arrow indicates occipital carina). 13, hind wing; 14, detail of hind wing, vein *cu-a* (arrow indicates the position of vein *Cu*1); 15, propodeum.



Figs 16-17. Stereoscan photographs of *Glypta* new species 2. 16, metasoma; 17, tergite II.



Figs 18-23. Stereoscan photographs of *Glypta* new species 3; 18, head, posterolateral; 19, detail of head (arrow indicates occipital carina); 20, hind wing; 21, propodeum; 22, metasoma; 23, tergite II.

4.4.6 Morphospecies of the genus *Zaglyptomorpha*

Zaglyptomorpha morphospecies A

Diagnosis. *Z.* morphospecies A shares with *Z. longula* and *Z. danunciae* having a strong angular projection in the frons. As it does not have a lateromedian longitudinal carina if does not present an area superomedia, which distinguishes to *Z. attenuata* described to Paraguay, *Z. danunciae* from Brazil and *Z. longula* from Mexico. It differs to *Z. albopicta* and *Z. decolorata* in pattern color. It differs to *Z.* sp. nov. 4 in its propodeum carinae characteristics: posterior transverse carina stronger than anterior transverse carina in *Z.* morphospecies A, posterior and anterior transverse carinae similar in *Z.* sp. nov. 4.

Female.

Head: Clypeus, in profile, weakly convex, in anterior view 1.5 times as broad as long, clypeal margin truncate; malar space 0.7 times as long as basal mandibular width; lower face in lateral view, convex centrally, with sparse setiferous punctures; frons with a strong angular projection; occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 47 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined. **Mesosoma:** Pronotum with upper part of epomia strong and very close to the dorsal margin of pronotum, centrally strong and curve, ventrally weaker and evanescent, not achieving ventral margin; pronotum, in dorsal view, with lateral margins forming two sharp lobes; mesoscutum smooth and pretty pubescent; notauli present until 0.4 of way along; scutellum at anterior half foveolate and pubescent, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth,

with long, fine setae; epicnemial carina present, laterally not reaching the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.3 times as long as the mid coxa; metapleuron smooth with long fine setae all over; pleural carina complete, strong from posterior margin to spiracle level, then weaker; propodeum smooth with pubescence at anterolateral and posterior margins, with carinae almost complete, posterior transverse carina complete and strong, anterior transverse carina present, lateral longitudinal carina present in front of anterior transverse carina, lateromedian longitudinal carina absent. Fore tibia with spur normally developed, 3.0 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.4 times the length of the shorter; hind leg with tarsomere I 1.6 times as long as tarsomeres II and III combined. Fore wing length 8.2 mm; hind wing length 6.4 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I moderately slender, about 1.4 times as long as posteriorly broad, smooth, laterally with some sparse setiferous punctures, with lateromedian longitudinal carina reaching 0.6 of way along; lateral longitudinal carina complete, stronger until spiracle level, with a vestige of a central carina on the posterior margin; tergite I, in lateral view with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.3 times as long as posteriorly broad, the raised triangular area centrally coarsely and sparsely punctate, and laterally smooth; the rest of tergite II smooth with some coarse punctures in the anterior and posterior margins, with oblique grooves strongly impressed, convergent anteriorly, and with a disctinct median longitudinal carina-like ridge, tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.8 times as long as hind tibia.

Color: Head black, clypeus yellow ocher, mandibles and surrounding area yellow ocher with apex brown ferruginous; eyes brown with conspicuous blackish spots. Antenna with scape and pedicel with a dark orange margin, flagellomeres dark brown. Mesosoma uniformly orange. Wings something infumate. Fore leg mostly orange with coxa light yellow; mid leg with coxa light yellow, trochanter, mostly dark brown with lateral margin light yellow, trochantellus light yellow, femur orange, tibia dark orange with apex infuscate, tarsi dark brown with apex yellow; hind legs with coxa light yellow with lateral (outer) margin with a black spot, trochanter blackish, trochantellus light yellow femur mostly blackish with a submedial orange ring, tibia mostly dark brown with a basal yellow ring, tarsi dark brown, tarsomere I with a basal yellow ring. Metasoma mostly reddish brown. Ovipositor orange, ovipositor sheaths black.

Material examined. Female, BRASIL: Paraná, Morretes, Parque Estadual do Pau Oco 48W 53’ 53.7’’ , 25 S 34’ 37.2’’, 10-13/IV/2002- Malaise, Ponto 2- Trilha, M.T. Tavares e equipe col. (DCBU).

Zaglyptomorpha morphospecies B

Diagnosis. It differs from *Z. albopicta* and *Z. decolorata* in pattern color. It differs from *Z. attenuate, Z. danunciae* and *Z. longula* in the propodeum; these three species have a completely delineated area superomedia, while *Z.* morphospecies B lacks longitudinal carinae, thus not forming an area superomedia. It differs to *Z.* sp. nov. 4**,** in its frons characteristics: frons with only a slightly raised and flared outwards carina above each antennal socket in *Z.* morphospecies B; frons with a strong angular projection in *Z.* sp. nov. 4.

Female.

Head: Clypeus, in profile, almost flat, in anterior view, 1.9 times as broad as long; clypeal margin truncate; malar space 2.0 times as long as basal mandibular width; lower face quite strongly convex centrally, finely punctuate; frons with only a slightly raised and flared outwards carina above each antennal socket; occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this very weakly bowed forwards. Antenna with 44 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and something sinuous, not reaching dorsal nor ventral margins; pronotum, in dorsal view, with lateral margins forming two weakly convex lobes; mesoscutum smooth with few setae; notauli present until 0.2 of way along; scutellum with some weak punctures, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth, with ventral margin pubescent; epicnemial carina present, laterally not reaching the level of lower corner of pronotum, ventrally unspecialized; sternal part of mesothorax 1.4 times as long as the mid coxa; metapleuron smooth with some sparse setae on the margins; pleural carina incomplete on anterior margin; propodeum smooth with pubescence at anterolateral and posterior margins, with carinae incomplete, posterior transverse carina complete and strong, anterior transverse carina complete but weak, lateral and lateromedian longitudinal carinae absent. Fore tibia with spur normally developed, 1.8 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.5 times the length of the shorter; hind leg with tarsomere I 1.2 times as long as tarsomeres II and III combined. Fore wing length 6.5 mm; hind wing length 4.6 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 2.6 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I moderately slender, about 1.4 times as long as posteriorly broad, smooth with some sparse setae on posterolateral margins, with lateromedian longitudinal carina reaching 0.4 of way along; lateral longitudinal carina complete, with a vestige of a central carina on the posterior margin; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.4 times as long as posteriorly broad, smooth except for minute setiferous punctures in impressions; tergite II with oblique grooves strongly impressed, convergent anteriorly, with a disctinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves.

Color: Head black, clypeus yellow, mandibles and surrounding area yellow, apex brownish; eyes reddish with some black spots; scape and pedicel ventrally brown yellowish; flagellomeres brown. Mesosoma uniformly orange. Wings hyaline with a pterostigma brown. Fore legs light yellow; mid leg with coxa, trochanter, trochantellus light yellow, femur yellow, tibia yellow with apical brown ring, tarsi brown, tarsomere I basally yellow; hind coxa yellow with a brown spot laterally, trochanter brown, trochantellus yellow, femur mostly brown with internal side yellow, apex yellow; tibia mostly yellow with subasal and apical ring brown; tarsi brown, tarsomere I basally yellow. Metasoma mostly brown with posterior margins with a yellow band.

Material examined. Male, BRASIL: SP Iperó, Flona de Ipanema, Morro Aracoiaba- Trilha caminho da Cobra Ponto 3, Malaise, 47W 37 ' 07.2 " , 23S 27 ' 01.7", 833 m, 17.IX-24.X.2007.17.IX-24.X.2007. Arouca e equipe col. (DCBU).

Zaglyptomorpha morphospecies C

Diagnosis: It resembles *Z. danunciae*, *Z. longula* and *Z.* morphospecies A in frons characteristics. Nevertheless *Z. danunciae* has epicnemial carina reaching above by far the level of lower corner of pronotum, and the epicnemial carina of *Z.* morphospecies C laterally just reaches to about the level of lower corner of pronotum; the carinae are complete and strong in *Z. longula* and some are incomplete and a little weak in *Z.* morphospecies M. It differs in pattern color of *Z. attenuata*, *Z. decolorata* and *Z. albopicta*. It differs to *Z.* sp. nov. 6 in its frons characteristics: frons with a strong angular projection in *Z.* morphospecies C**,** frons with only a slightly raised and flared outwards carina above each antennal socket in *Z.* sp. nov. 6.

Female.

Head: Clypeus, in profile, very weakly convex, in anterior view 1.6 times as broad as long; clypeal margin truncate; malar space 0.6 times as long as basal mandibular width; lower face rather flat, with setiferous punctures; frons with a strong angular projection; occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this bowed forwards. Antenna with 48 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined. **Mesosoma:** Pronotum with epomia strong, weakly bowed, extending from near upper margin of pronotum downwards to near lower corner, the lower part subparallel to anterior margin of pronotum; pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth with sparse setae; notauli present until 0.3 of way along; scutellum foveolate on the anterior margin, sparsely punctate and with setae the rest, dorsellum with few punctures; scutellum, in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with setae more concentrated on anterior and

lower margins; epicnemial carina present, laterally just reaching to about the level of lower corner of pronotum, ventrally unspecialized; epicnemium with a simple transverse carina in front of fore coxa; sternal part of mesothorax 1.8 times as long as the mid coxa; metapleuron smooth with long setae all over; pleural carina weak but present; propodeum smooth with setiferous punctures, more concentrated at posterior margin, with carinae almost complete, lateral longitudinal carina present between anterior and posterior transverse carinae (which are complete and strong), lateromedian longitudinal carina complete (weak behind posterior transverse carina). Fore tibia with spur normally developed, 3.1 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.3 times the length of the shorter; hind leg with tarsomere I 1.4 times as long as tarsomeres II and III combined. Fore wing length 9.0 mm; hind wing length 7.0 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.7 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I moderately slender, about 1.5 times as long as posteriorly broad, smooth with sparse setiferous punctures, with lateromedian longitudinal carina in dorsal view, reaching 0.78 of way along; lateral longitudinal carina complete, with a vestige of a central carina on the posterior margin; tergite I, in lateral view with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.3 times as long as posteriorly broad, the raised triangular area centrally coarsely punctate, laterally smooth, the rest of tergite II, with some setiferous punctures specially in lateral and posterior margins, with oblique grooves strongly impressed, convergent anteriorly, and with a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.5 times as long as hind tibia.

Color: Head black. Clypeus, mandibles and surrounding area, labial and maxilar palps orange; apex of mandibles ferrugineous brown; eyes brown with some blackish spots; antenna with scape, pedicel, black; flagellomeres blackish. Mesosoma orange. Wings something nebulous with pterostigma dark brown. Propodeum mostly ferrugineous brown, area externa orange. Fore legs orange, coxa weaker lighter; mid legs coxa light orange, trochanter dark brown, trochantellus yellow; femur orange, tibia dark orange; tarsi dark brown; hind legs, coxa light brownish with lateral (inner and outer sides) dark brown, trochanter dark brown, trochantellus light brownish, femur dark brownish with a subapical orange ring, tibia mostly dark brown with a basal, yellow ring, tarsi dark brown, tarsomere I with basal yellow ring. Metasoma, with first four tergites ferrugineous brown, tergite V with 2/3 anterior ferrugineous brown, 1/3 posterior dark orange; rest of tergites dark orange. Ovipositor orange, ovipositor sheaths black.

Material examined. Female, BRASIL: Santa Catarina, São Bento do Sul, Río Natal. 49W 22' 43" , 26S 15' 01", 838,39 m. Março/2002. Armadilha Malaise. M.M. Dombeck col. (DCBU).

Zaglyptomorpha morphospecies D

Diagnosis. It differs from *Z. danunciae*, *Z. longula*, and *Z.* morphospecies A in frons characteristics; It has a cornuted process in these three species, and a slight raised carina in *Z* . morphospecies D. *Z. attenuata* has a completely delineated area superomedia, while in *Z.* sp. nov. 9 the lateromedian longitudinal carina is only present anteriorly, not delineating an area superomedia. It differs from *Z. decolorata* and *Z. albopicta* in pattern color.

Female.

Head: Clypeus, in profile, very weakly convex, in anterior view 1.7 times as broad as long, clypeal margin truncate; malar space 0.9 times as long as basal mandibular width; lower face weakly convex, with setiferous punctures; frons with only a slightly raised and flared outwards carina above each antennal socket; occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible. Antenna with 45 flagellomeres; flagellomere I 1.0 times as long as flagellomeres II and III combined.

Mesosoma: Pronotum with subvertical part of epomia dorsally and ventrally weak and evanescent, not reaching dorsal nor ventral margins; pronotum, in dorsal view, with rather truncated lateral margins; mesoscutum smooth with few setae; notauli present until 0.5 of way along; scutellum smooth with a few weak foveolae, dorsellum with some punctures; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with setae more concentrated on anterior and lower margins; epicnemial carina present; laterally exceeding the level of lower corner of pronotum; epicnemium with a simple transverse carina in front of fore coxa; sternal part of mesothorax 1.6 times as long as the mid coxa; metapleuron smooth with some isolated setae at the posterior margin; pleural carina weak but present to spiracle level, then absent; propodeum smooth with setiferous punctures, more concentrated at posterior margin, with carinae incomplete, anterior and posterior transverse carinae present but weak, lateromedian longitudinal carina present anteriorly (i.e. before anterior transverse carina), lateral longitudinal carina absent. Fore tibia with spur normally developed, 2.9 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.1 times the length of the shorter; hind leg with tarsomere I 1.5 times as long as tarsomeres II and III combined. Fore wing length 6.7 mm; hind wing length 5.0 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.8 times as long as *Cu*1b; hind

wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I moderately slender, about 1.4 times as long as posteriorly broad, smooth with setiferous punctures more concentrated on lateral and posterior margins, with lateromedian longitudinal carina in lateral view, reaching 0.6 of way along, lateral longitudinal carina complete, and without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 1.3 times as long as posteriorly broad, coarsely but quite sparsely punctuate, with oblique grooves strongly impressed, convergent anteriorly, and with a disctinct median longitudinal carina-like ridge; tergite III and tergite IV similar to tergite II, but without a median longitudinal carina-like ridge; tergite V with vestiges of oblique grooves; ovipositor of moderate length, 2.1 times as long as hind tibia.

Color: Head black; clypeus, and mandibles yellow with apex dark orange, surrounding area of mandibles orange; eyes brown; scape and pedicel dark brown; flagellomeres brown. Mesosoma with pronotum, mesoscutum, scutellum and dorsellum orange; mesopleuron, metapleuron and propodeum dark orange. Wings something infuscate with pterostigma brown. Fore and mid legs orange; hind legs: coxa dark orange with anterior side ferrugineous, trochanter brownish, trochantellus yellow, femur orange, with base and apex ferrugineous; tibia mostly yellow with sub-basal and apical brownish rings, tarsi brownish except for the basal half of tarsomere I which is yellow. Metasoma with tergites I-III dark orange with apex with a posterior yellowish transverse strip; tergites IV-V ferrugineous with an apical yellowish transverse strip, tergites VI+ dark orange. Ovipositor orange, ovipositor sheaths dark brown.

Material examined: Female, BRASIL, Paraná, Araucária, 49W 14' 31", 25S 21' 08", **897** m, V/1967. Moure, Berg, Mielke (DPTO. ZOOL. UFPR).

Zaglyptomorpha morphospecies E

Diagnosis. It resembles *Z. danunciae, Z. longula, Z.* morphospecies A in having a strong angular projection in the frons. It differs to *Z. danunciae* in that this species have a median carina in the area superomedia, which is absent in *Z.* morphospecies E. It differs to *Z. attenuata, Z. decolorata, Z. albopicta* and *Z. longula* in pattern color.

Male.

Head: Clypeus, in profile, weakly convex, in anterior view, 2.1 times as broad as long, clypeal margin truncate; malar space 0.8 times as long as basal mandibular width; lower face weakly convex centrally, finelly and sparsely punctuate; frons with a strong angular projection; occipital carina dorsally, centrally interrupted; lower part of occipital carina complete, reaching hypostomal carina at base of mandible, the part just above this very weakly bowed forwards. Antenna with 43 flagellomeres; flagellomere I 0.8 times as long as flagellomeres II and III combined. **Mesosoma:** Pronotum with epomia very strong, but not particularly swollen near dorsal margin, evenly bowed its entire length, in dorsal view, with rather truncated lateral margins; mesoscutum smooth with imbricated spots; notauli present until 0.2 of way along; scutellum weakly areolate with some few fine setae, dorsellum smooth; scutellum in lateral view, convex, with posterior end, in dorsal view, truncated; mesopleuron smooth with some sparse and inconspicuous setae; epicnemial carina strong, laterally exceeding the level of lower corner of pronotum, ventrally unspecialized; epicnemium with a simple transverse carina in front of fore coxa; sternaulus absent but with a concavity in step; sternal part of mesothorax 1.6 times as long as the mid coxa; metapleuron smooth with long setae on the posterior margin; pleural carina weak but present to spiracle level, then absent; propodeum smooth with some pubescence at posterior margin, with carinae

complete, posterior transverse carina complete and strong, anterior transverse carina, lateromedian longitudinal carina and lateral longitudinal carina complete. Fore tibia with spur normally developed, 2.2 times as long as breadth of tibia; mid tibia with spurs more or less equal, the longer 1.1 times the length of the shorter; hind leg with tarsomere I 1.2 times as long as tarsomeres II and III combined. Fore wing length 6.2 mm; hind wing length 4.5 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.2 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I moderately slender, about 1.6 times as long as posteriorly broad, smooth, with lateromedian longitudinal carina in dorsolateral view, reaching 0.7 of way along; lateral longitudinal carina complete but weak, without any vestige of a central carina; tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; tergite II 1.4 times as long as posteriorly broad, the raised triangular area centrally coarsely punctate, peripherally smooth and polished, without a distinct median longitudinal carina-like ridge; tergite III and tergite IV similar; tergite V with vestiges of oblique grooves.

Color: Head black, clypeus, mandible and surrounding area, labial and maxilar palps yellow; eyes brown with some black spots. Antenna dark brown with apex of scape and pedicel, ventrally yellow. Mesosoma orange, propodeum mostly dark orange. Wings infumate, pterostigma brown. Fore legs orange; mid legs orange with tarsomeres darker; hind legs: coxa with base orange, apex dark orange; trochanter dark orange, trochantellus yellow; femur mostly orange, with base and apex darker, tibia mostly yellow with subbasal and apical brown ring; Tarsi brown, basitarse with base yellow. Metasoma: tergites I-V dark orange with apex orange, tergites VI + ferruginous.

Material examined. Male, BRASIL: Santa Catarina, Nova Teutônia, 52W 25’27”, 27 S 09’49”XII/ 1967, F. Plaumann leg.

4.4.7 Morphospecies of the genus *Sphelodon*

Sphelodon morphospecies A

Diagnosis. It resembles to *S.* n. sp.2, *S. guanacastensis*, *S. phoxopteridis* and *S. ugaldei* in not having a delineated area superomedia. It differs to *S.* n. sp.2, in pattern color, to *S. guanacastensis* in the characteristics of the mesopleuron, to *S. phoxopteridis* in that the lower end of occipital carina is distinct, while in *S.* morphospecies A is absent; differs to *S. ugaldei* in pattern color and number of flagellomeres. It differs to *S. annulicornis*, *S.* n. sp.1, and *S. wardae*, because these species have a completely delineated areolet.

Female.

Head: Clypeus 1.5 times as broad as long; lower face rather flat and smooth; malar space 0.7 times as long as basal mandibular width; frons weakly concave and smooth; occipital carina absent. Antenna with 43 flagellomeres, flagellum with a median whitish band between flagellomeres XII and XXI. **Mesosoma:** Pronotum long, not swollen above epomia, the epomia itself strong and long, but not reaching the upper margin of pronotum; sternal part of mesothorax 1.2 times as long as the mid coxa. Pleural carina complete but weak; propodeum with posterior and anterior transverse carinae strong and complete, lateromedian present until join anterior transverse carina and lateral longitudinal carina present anteriorly, interrupted after spiracle level. Fore tibia with spur normally developed, 2.1 times as long as breadth of tibia; mid tibia without conspicuous denticles on outer surface, and with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 7.5 mm; hind wing length 5.2 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.6 times as

long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.6 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I smooth, with lateromedian longitudinal carinae weak, in dorsal view present on anterior 0.1; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; base with a sharp lateral tooth of variable size with a basolateral tooth; tergite II 1.0 as long as posteriorly broad, with oblique grooves strongly impressed, with a central triangular area smooth and polished and lateral area with some fine and sparse setae; tergite III with oblique grooves weaker, with central triangular area smooth and lateral area with some fine setae; tergite IV with oblique grooves vestigial, with some fine setae all over; tergites III-IV similar though the latter with the oblique grooves weaker, with some setae specially in the lateral area. Ovipositor of moderate length, 1.6 times as long as hind tibia.

Color

Head: Face withish, with a short central longitudinal brown spot, clypeus withish, mandibles withish, with apex ferruginous; vertex black with two light yellow spots parallel to ocelli, close to eyes; ocelli light gray, occiput black, frons mostly black, eyes gray, gena dorsally black the rest mostly withish; labial and maxilar palps light orange; antenna ventrally with scape brown, with margin yellowish, pedicel yellowish, first flagellomere ventrally mostly brownish with a basal orange strip; flagellomeres II-X blackish, flagellomere XI partly blackish, flagellomeres XII-XVIII whitish, flagellomere XIX brownish, flagellomeres XX + blackish. Mesosoma orange: pronotum, mesopleuron, and metapleuron light orange. Wings Hyaline; pterostigma brown. Fore legs orange; mid legs orange, tarsi brownish; hind legs with coxa, trochanter, trochantellus orange; femur orange with an apical dark orange spot; tibia orange with two ferrugineous spots (one subbasal small, another big at the apex), tibial spurs

ferrugineous; tarsomeres withish, tarsomere I with base ferrugineous; telotarse mostly ferrugineous. Metasoma orange. Ovipositor orange, ovipositor sheaths blackish.

Material examined. Brasil: PARANA : Morretes Parque Estadual do Pau Oco 48W 53' 53.7" , 25S 34' 37.2" Malaise Bosque, PT.1 10-13.IV.2002 MTTavares & eq. col. BIOTA-FAPESP. (DCBU).

Sphelodon morphospecies B

Diagnosis. It differs to *S. annulicornis* in pattern color and propodeum characteristics: forming a delineated area superomedia in *S. annulicornis* such area absent in *Sphelodon* morphospecies B.

Female.

Head: Clypeus 1.8 times as broad as long; lower face with a weak median swelling; malar space 0.9 times as long as basal mandibular width; frons flat and smooth; occipital carina more or less entirely absent, with a short vestige laterally. Antenna incomplete; flagellum with a median whitish band between flagellomeres X and XIX.

Mesosoma: Pronotum long, not swollen above epomia, the epomia itself strong but short, not reaching the upper margin of the pronotum; sternal part of mesothorax 1.1 times as long as the mid coxa. Pleural carina complete and strong; propodeum with posterior transverse carina strong and complete, anterior transverse carina present and strong but incomplete (interrupted before spiracle); lateral longitudinal carina present behind posterior transverse carina with vestiges upside and downside, lateromedian longitudinal carina present before anterior transverse carina with vestiges behind anterior transverse and in front posterior transverse carina, thus not forming an enclosed area superomedia. Fore tibia with spur normally developed, 2.4 times as long as breadth of tibia; mid tibia without conspicuous

denticles on outer surface, and with spurs nearly equal, the longer 1.2 times the length of the shorter. Fore wing length 5.4 mm; hind wing length 3.8 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.9 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.5 times as long as the combined lengths of this vein and *cu-a*.

Metasoma with tergite I smooth, with lateromedian longitudinal carinae weak, present on anterior 0.3; tergite I in lateral view, with spiracle positioned anterior to centre, about 0.4 of way along; base with a sharp lateral tooth; tergite II 0.8 as long as posteriorly broad, with oblique grooves moderately impressed, with triangular area smooth and lateral area smooth with some setae; tergite III with oblique grooves weaker, with central triangular area smooth and lateral area with some fine setae; tergite IV with oblique grooves vestigial, with some fine setae all over. Ovipositor of moderate length, 1.7 times as long as hind tibia.

Color

Head: Face yellow with a central longitudinal brownish spot, clypeus yellow, mandibles yellow with apex brownish; labial and maxilar palps yellowish; frons centrally black, laterally ocher, vertex black centrally, laterally ocher, gena mostly ocher; eyes brownish. Antenna with scape brown ventrally with margin yellowish, pedicel yellowish; flagellomeres I-IX brown, flagellomere X mostly whitish, flagellomeres XI-XVIII whitish; flagellomere XIX mostly brown, flagellomeres XX + brown. Mesosoma with mesoscutum reddish, scutellum and dorsellum yellow. Pronotum reddish with ventral and dorsal margin yellow. Mesopleuron centrally mostly yellow with epicnemium, dorsal margin and posterior margin reddish. Metapleuron mostly yellow. Wings hyaline with pterostigma brown. Propodeum mostly reddish, with area posteroexterna, area petiolaris and ventral margin of area dentipara orange. Fore legs with coxa and trochanter, light yellow, trochantellus orange with a small brownish spot at junction with femur, femur tibia and tarsomeres orange; mid legs with coxa and trochanter light yellow, with trochantellus orange with a small brownish

spot, femur orange with a basal spot at the junction with trochantellus, tibia and tarsi orange; hind legs with coxa yellow with two ferrugineous spots (inner-outer sides), trochanter mostly yellow with a basal ferrugineous spot, trochantellus mostly ferrugineous, femur with outer side mostly ferrugineous, inner side weakly yellow, tibia and tibial spurs brownish, tarsi mostly whitish; tarsomere I basal half brown, the rest whitish; telotarsus brown. Metasoma with anterior and posterior part yellow, the rest ferrugineous; tergites II-IV with anterolateral corners and posterior margins yellow, the rest ferruginous; tergite V with first half ferrugineous, the second part yellowish; tergites VI-VII with anterior fine strip ferruginous, rest yellow; tergite VIII ferruginous, ovipositor orange, ovipositor sheaths brown.

Material examined. Female BRASIL, SP, São Carlos. Mata Faz. Canchim 47W 50' 33.28", 21S 57' 33.32", 856 m, *Croton floribundus* 25.VII.95/21. L.B.R. Fernandes. (DCBU).

4.4.8 Another morphospecies from *Glypta*

Glypta morphospecies A

Specimens examined

Female, BRASIL: Santa Catarina, Nova Teutônia, 52W 25’27”, 27 S 09’49”, XI/1969. F. Plaumann leg. (UFPR).

Diagnosis

It differs to *Glypta sanvita* in carinae of propodeum, delineating only an enclosed area superomedia and area dentipara in *G. sanvita* and delineating an enclosed areae basalis, superomedia and dentipara in *G.* morphospecies A. It differs to *G. rufipes* and *G. humilis* from Chile and *G. rufomarginata* from Mexico in pattern color: the flagellum of *G. rufipes* is black with a white ring, that of *G. humilis* is brown with the two first flagellomeres black, that of *G. rufomarginata* is black while in *G.* morphospecies A it is very dark brownish. Also differs to *G. rufiscutellaris*, nearctic species introduced in Uruguay and Argentina in pattern color (e.g. most of mesosoma fuscous in the exotic species, mostly orange in *G.* morphospecies A).

Female

Head: Clypeus in anterior view 2.2 times as broad as long; lower face with a weak median swelling; malar space 0.6 times as long as basal mandibular width; frons more or less flat with coarse, sparse punctures; occipital carina dorsally entirely absent; lower end of occipital carina reaching hypostomal carina at base of at base of mandible. Antenna incomplete.

Mesosoma: Pronotum with epomia weakly developed, not reaching dorsal margin of notum; sternal part of mesothorax 1.7 times as long as the mid coxa. Pleural carina complete but very weak; propodeum with transverse and longitudinal carinae delineating an enclosed areae basalis, superomedia and dentipara. Fore tibia with spur normally developed, 1.9 times as long as breadth of tibia; mid tibia with spurs nearly equal, the longer 1.0 times the length of the shorter. Fore wing length 4.5 mm; hind wing length 2.7 mm. Fore wing with abscissa of *Cu*1 between 1*m-cu* and *Cu*1a 1.4 times as long as *Cu*1b; hind wing with length of abscissa of *Cu*1 between *M* and *cu-a* 0.7 times as long as the combined lengths of this vein and *cu-a*; distal abscissa of *Cu*1 absent.

Metasoma: Tergite I, in lateral view, with spiracle positioned anterior to centre, about 0.3 of way along; tergite II 0.9 times as long as posteriorly broad, with deeply very impressed oblique grooves; the entire tergite with lateral area closely punctate, central area with some sparse punctures; tergites III-IV similar; tergites V+ striates. Ovipositor of moderate length, 2.2 times as long as hind tibia.

Color: Head black, clypeus, mandibles, labial and maxilar palps yellowish , apex of mandibles reddish; eyes dark brown; antenna very dark brownish. Mesosoma orange, scutellum and dorsellum yellow, ventral and dorsal margin yellow, subalar prominence, and tegula yellow. Wings infumate, pterostigma light brown. Fore legs, coxa, trochanter, trochantellus yellow; femur, tibia and tarsi orange; mid tibia with coxa, trochanter, trochantellus yellow; femur and tibia, orange, tarsi brownish; hind legs yellow with inner ventral brownish spot; trochanter yellow, trochantellus mostly ferruginous, femur ferruginous, tibia yellow ocher with subbasal and apical ferruginous bands (strips); tarsi ferruginous. Metasoma dark orange. Ovipositor orange, ovipositor sheaths dark brown.

5 CONCLUSIONS

1. Specimens of Banchinae can be observed in Brazil at least between 0 and 2039 m of altitude.

2. Individuals of the subfamily Banchinae are more likely to be collected during the rainy season.

3. The genera *Lissonota*, *Meniscomorpha* and *Syzeuctus* can be found in four Brazilian biomes: Amazonia, Atlantic Forest, Brazilian Savanna and agroecosystems.

4. The visited collections during this study made possible an advance in the knowledge about the subfamily Banchinae in the São Paulo State.

5. An estimate of the number and composition of the genera and the species of the subfamily Banchinae in Brazil will only be achieved when material from other regions, States, biomes and altitudes had been collected and reviewed.

6. Although nowadays there are sound taxonomic bases to identify virtually any specimen of the subfamily Banchinae at generic level in any tropical American country, more effort and studies will be necessary in order to improve the phylogenetic understanding of this group and to make the identification at species level easier.

7. Not all the species of *Sphelodon* have a flagellum with a median whitish band, so this character cannot be longer used to define the genus.

8. In order to find more characters that allow a more reliable identification of the genera *Zaglyptomorpha* and *Glypta*, it is necessary to investigate more their morphology.

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7 APPENDICES

Table 2. Relative frequency of specimens of Banchinae collected in each state of Brazil.

State	%
AC	0.31
AL	0.615
AM	1.15
AP	0.038
BA	0.11
DF	1.84
ES	6.11
GO	0.42
MA	0.038
MG	2.04

State	%
MT	1.65
PA	2.19
PE	0.307
PR	3.73
RJ	2.498
RO	1.46
RR	0.307
SC	4.804
SP	70.33
TO	0.038

Table 3. Biomes of the species of the tribe Glyptini registered in Brazil.

	Biome
Genus *Zaglyptomorpha*	
Zaglyptomorpha sp. nov. 1	Atlantic Forest
Zaglyptomorpha sp. nov. 2	Brazilian Savanna.
Zaglyptomorpha sp. nov. 3	Atlantic Forest
Zaglyptomorpha sp. nov. 4	Atlantic Forest
Zaglyptomorpha sp. nov. 5	Atlantic Forest
Zaglyptomorpha sp. nov. 6	Atlantic Forest
Zaglyptomorpha sp. nov. 7	Atlantic Forest
Zaglyptomorpha sp. nov. 8	Atlantic Forest
Zaglyptomorpha sp. nov. 9	Atlantic Forest
Zaglyptomorpha sp. nov. 10	Atlantic Forest
Zaglyptomorpha sp. nov. 11	Brazilian Savanna
Zaglyptomorpha sp. nov. 12	Brazilian Savanna
Zaglyptomorpha morphospecies A	Atlantic Forest
Zaglyptomorpha morphospecies B	Atlantic Forest
Zaglyptomorpha morphospecies C	Atlantic Forest
Zaglyptomorpha morphospecies D	Atlantic Forest
Zaglyptomorpha morphospecies E	Atlantic Forest
Genus *Sphelodon*	
Sphelodon n. sp.1	Amazonia
Sphelodon n. sp.2	Atlantic Forest
Sphelodon n. sp.3	Atlantic Forest
Sphelodon n. sp.4	Atlantic Forest
Sphelodon n. sp.5	
S. morphospecies A	Atlantic Forest
S. morphospecies B	Atlantic Forest
Genus *Glypta*	
Glypta new species 1	Atlantic Forest.
Glypta new species 2	Atlantic Forest.
Glypta new species 3	Atlantic Forest.
Glypta morphospecies A	Atlantic Forest.

Table 4. Distribution of the number of specimens of each genera of Banchinae in rainy and wet seasons.

	Subtotal rainy season	Subtotal wet season
Diradops	264	151
Syzeuctus	465	106
Meniscomorpha	500	142
Hapsinotus	4	7
Procestus	1	
Exetastes	82	32
Hadrotesthus	25	
Lissocaulus	44	1
Occia	42	13
Glypta	7	0
Zaglyptomorpha	32	9
Sphelodon	14	15
Mnioes	191	26
Lissonota	72	16
New Genus	111	133
Total	1854	651

8 ANNEXES

REMARKS AND DIAGNOSTIC CHARACTERS OF SOME OF THE GENERA OF BANCHINAE FOUND IN BRAZIL, ACCORDING TO GAULD *et al.*, (2002).

Tribe Banchini

Genus *Exetastes* Gravenhorst

Exetastes is one of the most distinctive genera in the subfamily, and is easily recognized by the combination of short first abscissa of *Cu*1 and a large kite-shaped areolet in the fore wing. All species have the hind legs very long and strong, with the coxae enlarged and the tibial spurs long. Most have a relatively short ovipositor, which is often decurved, but in a few species the ovipositor is similar but about as long as the metasoma.

Tribe Atrophini

Genus *Cecidopimpla* Brèthes

Cecidopimpla is a small, predominantly Neantarctic genus comprising rather few species. Previously it has been restricted to a small group of species with the lower mandibular tooth slightly longer than the upper, and the clypeus medially notched (TOWNES, 1970), and it is with some hesitation that we include a new Costa Rican species within it. This species differs in having the upper mandibular tooth clearly longer and stouter than the lower, and having the clypeus simply concave rather than notched. However, it does resemble the South American species in having the following derived features:

- tergite I strongly convex;
- tergite II with a post-median transverse impression;
- having a rather short, stout ovipositor.

Genus *Diradops*

Diradops is an endemic New World genus, most species of which are tropical, although one occurs in the eastern United States (TOWNES, 1970). It is one of the most distinctive atrophine genera, characterized by the following features:

- face almost always with a median vertical swelling;
- submetapleural carina very strongly broadened anteriorly into a large lobe;
- fore tibial spur very elongate, so the part distal to the membranous flange is far longer than the membranous flange;
- fore wing without any trace of 3*rs-m*;
- fore wing with a very short bulla in 2*m-cu*;
- ovipositor short, not exceeding 0.7 of length of the hind tibia.

Genus *Hadrostethus*

Hadrostethus is a rather small genus that is most species-rich in the New World tropics, although a single species occurs in North America (TOWNES & TOWNES, 1978) and one species has been described from the Paleartic/Oriental interface in India and Taiwan (CHANDRA & GUPTA, 1977). *Hadrostethus* species are rather stouter and more coarsely sculptured than most other banchines, and the taxonomic affinity of the genus is not clear. It is defined by the following features:

- submetapleural carina anteriorly expanded into a lobe that is rather angulate posteriorly;
- propodeum abruptly declivous, without a distinct posterior transverse carina (although a central vestige may be discernible);
- ovipositor short, 0.3-0.5 times as long as the hind tibia.

Genus *Hapsinotus*

Hapsinotus is a moderately large Neotropical genus that is apparently present throughout the entire lowland New World tropics. Although only a single species has been described (YU & HORSTMANN, 1998) numerous others are present in collections and await description. The genus was described by TOWNES (1970) as having a distinctly areolated propodeum (an almost unique feature for atrophines). However, in some species only the posterior transverse carina is discernible. Furthermore, not all species have the lateromedian longitudinal carinae of tergite I as well developed as Townes mentioned. These characters aside, *Hapsinotus* is still one of the most distinctive atrophine taxa. It is most easily recognized by the uniquely modified, swollen clypeus, and it is characterized by the following derived features:

- clypeus with median subapical part swollen and more or less overhanging the clypeal margin so that the margin is blunt;
- tarsal claws large with very short pectinae;
- presence of a median impression on the scutellum (although this is not present in all species, it is of wide occurrence in the genus, and thus is putatively a ground-plan apomorphy of the group);
- metanotum with hind rim sublaterally expanded into a large flat denticle that points backwards towards the lateral longitudinal carina.

Genus *Lissocaulus*

Lissocaulus is one of the most distinctive Neotropical genera of Atrophini on account of having the petiolar spiracle behind the centre of Tergite I. It is characterized by the following apomorphic features:

- inner margins of antennal sockets raised to form crests which extend upwards, meeting to form a conspicuous inverted V-shaped promontory between antennal sockets;
- occipital carina slightly sinuous and reaching the mandibular base without clearly joining the hypostomal carina;
- epicnemial carina laterally produced forward into a prominence that almost reaches the lower corner of the pronotum;
- metasternum with well-developed sharp protuberances between the coxal insertions;
- tergite I of metasoma slender, in lateral view with spiracle positioned well behind centre.

Genus *Lissonota*

Lissonota is a very large cosmopolitan group of at least 1000 species. As currently defined it is undoubtedly a paraphyletic assemblage of atrophine species that cannot be classified in other, more clearly delineated groups. Thus it is impossible to define except in terms of (almost certainly) plesiomorphic features- a long ovipositor, long or double bulla in 2*m-cu*, finely granulate and rather stout tergite I, lack of metasomal tubercles and so forth. Many species have a moderately developed anterior lobe on the submetapleural carina, but this may be weak in some taxa. Most species have a defined areolet in the fore wing, but a few taxa lack vein 3*rs-m*.

Genus *Meniscomorpha*

Meniscomorpha is characterized by the possession of the following features:

- submetapleural carina very strongly broadened anteriorly into a large lobe;
- hind coxa of female with an anteroventral concavity;
- fore wing without any trace of 3*rs*-*m*;
- fore wing with a very short bulla in vein 2*m*-*cu* (except in one species-group);
- fore wing with abscissa of *Cu*1 between 1*m*-*cu* and *Cu*1a short;
- ovipositor exceeding 1.3 times the length of the hind tibia.

Genus *Mnioes*

Mnioes is primarily a Neotropical genus with a single species present in the United States (TOWNES & TOWNES, 1978). Currently seven species have been described (YU & HORSTMANN, 1998), but many other await description and the genus is quite speciose in Mesoamerica and northern South America. In the past (TOWNES, 1970) this genus was characterized by, amongst other features, the possession of a tooth laterally on the hind margin of the metanotum. Many, but by no means all species have a well developed flattened tooth in this position, but in some the tooth is very small and rather difficult to distinguish. However, *Mnioes* may be distinguished from other atrophine genera by the following features:

- outer surface of the mandible convex and polished close to the base of the upper tooth;
- clypeus anteromedially weakly sclerotized, impressed so margin appears to have a weak median apical notch.
- fore wing without vein 3*rs*-*m*, and with 2*rs*-*m* and 2*m*-*cu*

- fore wing generally with 2*m-cu* with two bullae separated by a short length of vein that bears a stub of a spurious vein.

Furthermore, most *Mnioes* species are matt and finely sculptured all over their bodies, they have no trace of lateromedian carina on tergite I, and the long 2*rs-m* in the fore wing is often slightly angled below the centre. The combination of these features allow this genus to be recognized very easily, and indeed in practice, the characteristic surface sculpture alone is enough to more or less enable recognition.

Genus *Occia*

*Occia i*s a small Neotropical genus comprising only four described species with a cumulative range extending from Mexico south to Peru and southern Brazil. This very distinctive genus is defined by the following features:

- frons concave between antennal sockets, with margin of socket produced and overhanging this concavity and with a medially impressed transverse flange above the concave area;
- lower corner of propleuron turned forwards, forming a small crest;
- epicnemium with a small tooth-like lamella present just below the lower corner of the pronotum;
- submetapleural carina broadened near centre into a tooth-like promontory;
- fore coxa with a sharp basal carina;
- fore wing with a single bulla in 2*m-cu*;
- fore wing lacking any trace of 3*rs-m*, with abscissa of *M* between 2*rs-m* and 2*m-cu* almost as long as 2*m-cu*;
- hind wing with distal abscissa of *Cu*1 joining *cu-a* very close to *M*.

Genus *Procestus*

Procestus is a small endemic tropical American genus comprising two described species, *P. nabis* Townes in southern Mexico and *P. simplex* Townes in Brazil (TOWNES, 1970), and with a very few undescribed species occurring in other parts of the Neotropics.

The genus is characterized by the following autapomorphies:

- mandibles with a pronounced ventral flange;
- occipital carina joining hypostomal carina at mandibular base;
- epicnemium with a weak lamella present;
- submetapleural carina very strongly broadened anteriorly into a large lobe;
- propodeum with a more or less distinct anterior transverse carina;
- mid tibia with numerous small denticles on outer surface;
- fore wing with 1*m-cu* and *Cu*1a basally very close together.

Genus *Syzeuctus*

Syzeuctus is a large cosmopolitan genus comprising about 110 described species, most of which occur in the Old World (YU & HORSTMANN, 1998), where the genus seems to show its greatest morphological diversity. *Syzeuctus* is a distinctive genus that is perhaps most easily recognized by the characteristic elongately petiolate areolet in the fore wing. Most species also have frontal crests, and many are black and yellow marked. The genus is characterized by the following derived features:

- mandibles strongly tapered, ventrally sharply margined and externally concave;
- occipital carina slightly sinuous, joining the hypostomal carina at the mandibular base;
- pronotum with a long strong epomia;
- epicnemium with a lamella present;

- submetapleural carina very strongly broadened anteriorly into a large lobe;
- metasternum with well-developed sharp protuberances between the coxal insertions;
- fore wing with a petiolate rhombic areolet.

Some observations about the Banchinae phylogeny by GAULD *et al*. (2002).

Lissocaulus may well be closely related to *Syzeuctus*, as TOWNES (1970) suggests. Both genera have well developed metasternal processes and similar occipital carinae that reach the base of the mandible. The sinuous epicnemial carina with its almost tooth-like projection to the lower corner of the pronotum, so characteristic of *Lissocaulus,* is also found in some extralimital *Syzeuctus* species, and the rather characteristic epicnemial tooth of neotropical *Syzeuctus* (and some other genera) may represent a vestige of this carinal modification. In venation, the metasternal process and the form of the propodeum, *Lissocaulus* also resembles species of *Leptobatopsis*, but wheter there is a real phylogenetic analysis of the group is undertaken. *Meniscomorpha* may possibly be paraphyletic with respect to *Diradops*, but confirmation of this will have to await more detailed study of the group. It may always be differentiated from *Diradops* on account of its much longer ovipositor and less elongate fore tibial spur. Probably most confusion will be experienced separating *Meniscomorpha* from *Lissonota*. All the species of *Lissonota* that do not have an areolet in the fore wing have long bulla in 2*m-cu*, and the abscissa of *Cu*1 between 1*m-cu* and *Cu*1a very much longer than *Cu*1b. No *Lissonota* species have transverse striae on the propodeum.

As currently defined *Meniscomorpha* includes a great diversity of species which form a number of rather nebulous species-groups. When the whole Neotropical fauna is better

known, one or two of these may warrant distinction as separate genera, though at present these seem to us to be better all included in a single genus.

Although *Occia* is very distinct from other taxa, its possible phylogenetic affinities are perplexing. TOWNES (1970) treated it as belonging to a group of genera that included *Meniscomorpha* and *Diradops* because it lacks 3*rs-m* in the fore wing and has a very short bulla in 2*m-cu*. Rather confusingly however, it also resembles members of his *Syzeuctus* genus-group. Like *Occia*, both *Syzeuctus* and *Procestus* have a small lamella or tooth on the epicnemium and they generally have the frons somewhat modified above the antennal socket. Relationships are further complicated by the fact that several of these apparently specialized features are also found in some neotropical glyptines, especially species of *Zaglyptomorpha*.

The ventral flange on the mandibles and the position of the occipital carina of *Procestus* resemble those of *Syzeuctus*, and the two genera are probably closely related.

Ptychopsis. The relatively (for an atrophine) short ovipositor suggests it may be related to *Diradops*, but unlike *Diradops* species, which all have a very long modified fore tibial spur, *Ptychopsis* has a short plesiomorphic fore tibial spur.

Syzeuctus is apparently closely related to *Procestus* and *Lissocaulus* as all have rather similar occipital carinae, *Syzeuctus* species and *Lissocaulus* have well-developed protuberances on the metasternum (a weak one is present in *Procestus*), and *Syzeuctus* and *Procestus* possess epomiae. *Syzeuctus* species also resembles species of the glyptine genus *Zaglyptomorpha* in these features, and in having an epicnemial lamella, generally having the upper end of the epomia crest-like and in usually having the frons ornamented above the antennal sockets.

Whether these are parallel modifications or indicate a real phylogenetic affinity is not clear at present.

The status of *Zaglyptomorpha* as a monophyletic group is rather tenuous as it rests on a single apomorphic feature, the swollen upper end of the epomia. However, there is considerable variation in this feature within the related genus, *Sphelodon*, suggesting that variation in the extent of the epomial swelling can occur between quite closely related species. We suspect that *Zaglyptomorpha* may not be monophyletic, and that the very distinctive *Z. bella* species-group may be more closely related to the *wahli* species-group of *Glypta*, than it is to other *Zaglyptomorpha* species. Both have very similar, modified propodea. However, an investigation into the monophyly of this and (necessarily) other glyptine genera is beyond the scope of this work, as more material from tropical America needs to be examined and rigorously cladistically analysed. To aid in the delineation of monophyletic groups we do, however, recognize three putatively monophyletic species-groups.