TWO NEW SPECIES OF *Galeopsomyia* (HYMENOPTERA, EULOPHIDAE) FROM BRAZIL: A CORRECTION OF PUBLISHED MISTAKES

Nelson Wanderley Perioto[1,2], Valmir Antonio Costa[3], Rogéria Inês Rosa Lara[1]

[1] Laboratório de Bioecologia e Taxonomia de Parasitoides e Predadores, APTA - Ribeirão Preto. Av. Bandeirantes, 2419, CEP 14030-670, Ribeirão Preto, SP, Brazil. telefax: +55-16-36371849. E-mail: nperioto2@gmail.com.
[2] Departamento de Fitossanidade, Faculdade de Ciências Agrárias e Veterinárias – FCAV, Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP, Via de Acesso Prof. Paulo D. Castellane, s/n, CEP 14884-900, Jaboticabal, SP, Brazil.
[3] Instituto Biológico, APTA. Rodovia Heitor Penteado, km 3. C.P. 70, CEP 13012-970, Campinas, SP, Brazil, telefax: +55-19-3252-2942. E-mail: valmir@biologico.sp.gov.br.

ABSTRACT

This article aims to correct the article of N.W. Perioto, V.A. Costa and R.I.R. Lara, entitled "Two new species of *Galeopsomyia* (Hymenoptera, Eulophidae) from Brazil", published in Revista de Agricultura, v.82, p.297-297, 2007, where *Galeopsomyia macaxeira* and *Galeopsomyia glypta* were described. In that publication, due to editorial errors, the names proposed to the new species were omitted in the descriptive texts. As it was published, it was not clear in the descriptions which species belongs to the material examined, which contradicts the rules of the International Code of Zoological Nomenclature.

Key words: erratum, eucalyptus, *Jatrophobia brasiliensis*, *Manihot esculenta*, *Thyrinteina arnobia*.

DUAS NOVAS ESPÉCIES OF *Galeopsomyia* (HYMENOPTERA, EULOPHIDAE) DO BRASIL: UMA CORREÇÃO DE ERROS PUBLICADOS

RESUMO

Este artigo tem por finalidade corrigir o artigo de N.W. Perioto, V.A. Costa e R.I.R. Lara, intitulado "Two new species of *Galeopsomyia* (Hymenoptera, Eulophidae) from Brazil", publicado na Revista de Agricultura, v.82, p.297-297, 2007, onde *Galeopsomyia macaxeira* e *Galeopsomyia glypta* foram descritas. Naquela publicação, devido a erros editoriais, os nomes propostos para as novas espécies foram omitidos nos textos das descrições das espécies. Da forma como publicado, não ficou claro nas descrições a qual espécie pertencia o material examinado, o que contraria as regras do Código Internacional de Nomenclatura Zoológica.

Palavras-chave: errata, eucalipto, *Jatrophobia brasiliensis*, *Manihot esculenta*, *Thyrinteina arnobia*.

INTRODUCTION

The genus *Galeopsomyia* (Hymenoptera, Eulophidae) comprises 17 species distributed in the New World, 12 of which have Neotropical distribution and five of them were recorded from Brazil (Noyes 2005). Except *G. fausta* LaSalle, 1997, a parasitoid of the citrus leafminer *Phyllocnistis citrella* Stainton, 1856 (Lepidoptera, Gracillariidae) (LaSalle & Peña 1997), all known species of *Galeopsomyia* attack galls, mostly as Cynipidae and Cecidomyiidae parasitoids, but occasionally as inquilines (LaSalle 1994).

The leaf galls on cassava (*Manihot esculenta*, Euphorbiaceae) is caused by *Jatrophobia brasiliensis* (Rubsaamen, 1907) (Diptera, Cecidomyiidae) and have little economic impact but, at severe attack, can deform the leaves and prevent the normal development of young plants.

Thyrinteina arnobia (Stoll, 1782) (Lepidoptera, Geometridae) is the most harmful defoliator of eucalyptus in Brazil; some larvae were found parasitized by an undetermined species of *Glyptapanteles* (Hymenoptera, Braconidae) in Anhembi, São Paulo State, Brazil.

This article aims to correct the article published by Perioto et al. (1997), where *Galeopsomyia macaxeira* and *Galeopsomyia glypta* were erroneously described because of errors in editing. As it was published, the headings were omitted before the descriptions and thus it was not explicit that the following text was referring to the description of a new species, which contradicts the rule of the International Code of Zoological Nomenclature (Paragraph 16.1) (INTERNATIONAL COMMISSION OF ZOOLOGICAL NOMENCLATURE, 1999).

MATERIAL AND METHODS

Specimens of *Galeopsomyia macaxeira*, were reared by Neliton Marques da Silva from leaf galls on cassava in Manaus, Amazonas State, Brazil, and the specimens of *Galeopsomyia glypta* were reared by João Ângelo Cerignoni from cocoons of *Glyptapanteles* sp., which were parasitizing *T. arnobia* on eucalyptus leaves in Anhembi, São Paulo State, Brazil. Observations for descriptions were made using a Leica MZ 9.5 stereomicroscope and fluorescent light source. Images of scanning electron micrographs were made with a Jeol SEM of the "Departamento de Biologia Celular e Molecular e Bioagentes Patogênicos", from the "Faculdade de Medicina de Ribeirão Preto/Universidade de São Paulo". The images were captured on a Neopan 100 film and digitized from the negative using a scanner. The figures were prepared using Adobe© Photoshop. Morphological terminology follows Gibson (1997) except for basigastral carina - a strong transverse carina along the anterior margin of the first gastral tergite - and basigastral costula - any longitudinal carina extending posteriorly from the basigastral carina (see LaSalle & Peña 1997). Sculpturing terminology follows Harris (1979). Abbreviations are as follows: F*n*, flagellomeres (*n* = number of the flagellomere); Mt*n*, metasomal tergites (*n* = number of the metasomal tergite); OOL= ocello-ocular distance; POL= post-ocellar distance.

List of repositories

MZSP - Museu de Zoologia da Universidade de São Paulo (São Paulo, Brazil). C. R. F. Brandão, curator;

UFES - Universidade Federal do Espírito Santo (Vitória, Brazil). C. O. Azevedo, curator.

***Galeopsomyia macaxeira* Perioto, Costa & Lara** (Figs. 1-8)

Diagnosis: sculpture of the bottom of the triangular fovea below eye not visible; propodeum with median carina bifurcated anteriorly, without other carinae between the median and paraspiracular carinae; petiole indistinct; basigastral costulae present and hardly visible; Mt_1 and Mt_4 the longest tergites.

Holotype female: length= 1.6 mm. Head and mesosoma black with violet and blue-greenish metallic shine except by brown coloration on mandibles, fore (with soft blue-greenish metallic shine) and median coxa, trochanter and femur, which is pale yellow apically; light brown coloration on pedicel, flagellum and tegula; pale yellow coloration on scape, tibiae and tarsus; dark

red coloration on eye and ocelli. Gaster dark brown with soft blue-greenish metallic shine. Wings hyaline, setae and veins light brown. Body with white setae.

Head: (Fig. 1) 1.3 x wider than high; POL/OOL= 2.3; eye 1.4 x the length of malar space; malar sulcus straight with a small triangular fovea below eye (Fig. 2) (length= ca. 0.3 x malar sulcus); gena with shallow sculpturation around fovea, giving a shine aspect; occiput, supraclypeal area and upper and lower face imbricate. Scrobal depression without distinct sulci and with longitudinal median ridge; anterior tentorial pit distinct; clypeus bilobed.

Antenna (Fig. 3): scape 4.5 x, pedicel 1.8 x, F_1 1.6 x, F_2 1.8 x, F_3 1.6 x and clava (3 segmented) 3.2 x longer than wide, 3 anelli.

Mesosoma (Figs. 4, 5): 1.4 x longer than wide in dorsal view. Mesoscutum imbricate (Fig. 6) dorsally with notauli complete, deep; median sulcus vaguely indicated posteriorly and indistinct anteriorly; 7-9 adnotaular setae irregularly distributed. Scutellum imbricate as in Fig. 7, with 3 pairs of setae, the posterior being the longest; sublateral and submedian lines complete, broad and deep, median sulcus vaguely indicated on anterior portion. Dorsellum reticulated. Propodeum (Fig. 8) reticulated, with median carina bifurcated anteriorly, without other carinae between the median and paraspiracular carinae, posterior margin sharply margined. Petiole inconspicuous.

Fore wing: 2.2 x longer than wide; submarginal vein 1.2 x length of marginal vein; marginal vein 2.9 x length of stigmal vein and post-marginal vein absent; submarginal vein with 4 setae on dorsal surface; speculum and basal cell present, delimited by cubital setal line, basal setal line indicated by 4 setae.

Metasoma: 3.3 x longer than high in lateral view and 3.6 x longer than wide in dorsal view, reticulate, Mt_1 and Mt_4 in dorsal and lateral view are the longest. Mt_1 with a small and hardly visible basigastral costulae.

Variability: body length 1.6-2.3 mm. POL/OOL= 1.5-2.3; eye high 1.4-1.9 x malar space; scape 3.8-4.6 x, pedicel 1.6-1.8 x, F_1 1.3-1.7 x, F_2 1.5-1.8 x, F_3 1.4-1.7 x and clava 2.9-3.7 x longer than wide. Mesosoma 1.3-1.5 x longer than wide in dorsal view; mesoscutum with 7-10 adnotaular setae irregularly distributed. Fore wing 2.0-2.5 x longer than wide, submarginal vein 0.9-1.2 x length of marginal vein, marginal vein 2.9-4.1 x length of stigmal vein; submarginal vein with 4-5 setae on dorsal surface. Metasoma 2.7-3.6 x longer than wide in dorsal view and 2.7-3.4 x longer than high in lateral view.

Male allotype: length= 1.3 mm. Similar to females except for: POL/OOL= 1.6; eye 1.8 x length of malar space. Antenna with 4 funicular segments. Funicular segments with basal whorls of long setae. Scape 2.7 x, pedicel 2.0 x, F_1 1.0 x; F_2 2.5 x, F_3 1.7 x, F_4 1.7 x and clava (3 segmented) 3.7 x longer than wide. Scape with medial dark brown ventral plaque, ca. 0.5 x length of scape. Mesosoma 1.6 x longer than wide. Fore wing 2.1 x longer than wide; submarginal vein 0.9 x length of marginal vein; marginal vein 3.3 x length of stigmal vein, basal setal line indicated by 3 setae. Metasoma 1.8 x longer than wide in dorsal view and 2.3 x longer than high in lateral view.

Male variation: length= 1.1-1.3 mm; head 1.2-1.5 x higher than wide; POL/OOL= 1.5-1.9; eye height 1.5-2.2 malar space; scape 1.9-2.8 x, pedicel 1.4-2.0 x, F_1 0.9-1.0 x, F_2 1.5-2.3 x, F_3 1.3-2.3 x, F_4 1.7-2.5 x and clava 3.7-5.3 x longer than wide. Mesosoma in dorsal view 1.4-1.6 x longer than wide. Fore wing 2.1-2.3 x longer than wide; submarginal vein 0.9-1.1 x length of marginal vein; marginal vein 2.5-3.6 x length of stigmal vein. Metasoma 1.8-3.0 x longer than wide and 2.3-3.2 x longer than high.

Distribution: Manaus, Amazonas State, Brazil.

Remarks: *Galeopsomyia macaxeira* may be distinguished from other species of the genus, with exception of *G. fausta*, by the presence of basigastral costulae on Mt_1. From *G. fausta* it differs in lacking a distinctly visible petiole and basigastral carinae, by having basigastral costulae hardly visible, Mt_1 and Mt_4 the longest segment and by the fovea bellow eye without visible sculpturation.

Biology: *Galeopsomyia macaxeira* were reared from leaf galls on cassava and is probably associated to *J. brasiliensis*, the gall maker.

Etymology: the specific epithet refers to one of the popular Brazilian names of cassava.

Material examined: 12 females, 14 males. HOLOTYPE female: BRASIL, Amazonas, Manaus, 17.VI.2004, N.M. da Silva, col., *ex.* galha foliar em *Manihot sculenta*. Deposited in MZSP. ALLOTYPE male: same label as holotype. Deposited in MZSP. PARATYPES: MZSP (5 females, 6 males) and UFES (6 females, 7 males), same label as holotype.

***Galeopsomyia glypta* Perioto, Costa & Lara** (Figs. 9-16)

Diagnosis: Metasoma collapsible, with shallow reticulate sculpturation.

Holotype female: length= 2.0 mm. Head, mesosoma, metasoma, metacoxa and gaster black with green metallic shine; fore and median coxa, femur (pale yellow apically) dark brown coloration; mandibles brown; light brown antenna and tegula; tibiae and tarsus pale yellow coloration; eye and ocelli dark red (the ocelli became darker by dehydration). Wings hyaline, setae and veins pale yellow. Body with white setae.

Head: (Fig. 9) 1.4 x higher than wide; POL/OOL= 1.9; eye 1.6 x the length of malar space; malar sulcus straight, malar space with a small triangular fovea below eye (length= ca. 0.3 x malar sulcus) (Fig. 10); gena and occiput imbricate, supraclypeal area imbricate, upper face punctate imbricate with sparsely punctuation. Scrobal depression without distinct sulci, but with a longitudinal median ridge; clypeus bilobed.

Antenna (Fig.11): scape 5.0 x, pedicel 2.3 x, F_1 1.5 x, F_2 1.5 x, F_3 1.3 x and clava (3 segmented) 2.5 x longer than wide, 3 anelli.

Mesosoma: 1.4 x longer than wide (Fig. 12, 13) in dorsal view. Mesoscutum dorsally imbricate (Fig. 14) with notauli complete, deep; median sulcus complete; 11-13 adnotaular setae irregularly distributed; scutellum imbricate as in Fig. 15, with three pairs of setae (the posterior being the longest), sublateral and submedian lines complete, broad and deep; median sulcus vaguely indicated on anterior portion. Dorsellum reticulated. Propodeum (Fig. 16) reticulated with median carina bifurcated anteriorly, without other carinae between the median and paraspiracular carinae, posterior margin sharply margined. Petiole inconspicuous.

Fore wing: 2.3 x longer than wide; submarginal vein 0.9 x length of marginal vein; marginal vein 4.4 x length of stigmal vein and post-marginal vein absent; submarginal vein with four setae on dorsal surface; speculum and basal cell present, not delimited by cubital setal line, basal setal line indicated by three setae.

Metasoma: Reticulate and collapsible in air dried specimens, Mt_1 in dorsal and lateral view is the longest and slightly reticulate.

Variability: body length 1.8-2.0 mm; POL/OOL= 1.7-1.9; eye high 1.5-1.6 x malar space; scape 4.3-5.0 x, pedicel 2.0-2.3 x, F_1 1.4-1.5 x, F_2 1.4-1.5 x, F_3 1.3-1.4 x and clava 2.5-2.7 x longer than wide. Mesosoma 1.3-1.4 x longer than wide in dorsal view; 10-13 adnotaular setae irregularly

distributed. Fore wing 2.0-2.3 x longer than wide; submarginal vein 0.9-1.0 x length of marginal vein; marginal vein 4.4-4.8 x length of stigmal vein.

Male allotype: length= 1.3 mm. Similar to females except for: POL/OOL= 2.0; eye 1.8 x length of malar space. Funicular segments with whorls of long setae; setae of F1 reaching base of clava; scape 3.0 x, pedicel 1.3 x, F_1 1.1 x, F_2 1.9 x, F_3 2.5 x, F_4 2.5 x and clava (3 segmented) 5.8 x longer than wide, ventral plaque of scape ca. 0.4 x length of scape, light brown with basal portion dark brown. Mesosoma 1.1 x longer than wide, 4-5 adnotaular setae. Fore wing 2.1 x longer than wide, submarginal vein 0.9 x length of marginal vein, marginal vein 4.9 x length of stigmal vein, submarginal vein with 4 setae.

Male variation: length= 1.3-1.6 mm. Head 1.1-1.4 x higher than wide; POL/OOL= 1.9-2.0; eye height 1.5-1.8 malar space; scape 2.7-3.0 x, pedicel 1.3-1.7 x, F_1 1.1-1.3 x, F_2 1.9 x, F_3 2.0-2.5 x, F_4 2.1-2.5 x and clava 4.1-5.8 x longer than wide, ventral plaque 0.4-0.7 length of scape. Mesosoma in dorsal view 1.1-1.4 x longer than wide. Fore wing 2.1 x longer than wide, submarginal vein 0.9-1.1 x length of marginal vein, marginal vein 4.3-4.9 x length of stigmal vein.

Distribution: Anhembi, São Paulo State, Brazil.

Remarks: Unlike the other species of this genus, *Galeopsomyia glypta* has slight reticulate sculpturation on metasoma; Mt_1, in dorsal and lateral view, is the longest tergite. Unlike *G. fausta* and *G. macaxeira*, *G. glypta* has no basigastral carinae and costulae. This is the first species of the genus whose metasoma collapses in air dried specimens.

Biology: Galeopsomyia glypta was obtained from cocoons of *Glyptapanteles* sp., which were parasitizing a *T. arnobia* larva on eucalyptus leaves.

Etymology: the specific epithet refers both to its surface sculpturing and to its host, *Glyptapanteles* sp.

Material examined: 4 females, 4 males. HOLOTYPE: BRASIL, São Paulo, Anhembi, 1.VI.2003, J.A. Cerignoni, col., *ex* casulos de Microgastrinae em *Thyrinteina arnobia* em eucalipto. Deposited in MZSP. PARATYPES: MZSP (1 females, 1 males) and UFES (2 females, 2 males), same label as holotype.

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REFERENCES

GIBSON, G.A.P. 1977. Morphology and terminology. In: GIBSON, G.A.P., HUBER, J.T. & WOOLLEY, J.B. (Eds.). **Annotated keys to genera of Nearctic Chalcidoidea (Hymenoptera).** NRC Research Press, Ottawa, p.16-44.

HARRIS, R.A. 1979. A glossary of surface sculpturing. **Occasional Papers in Entomology**, 28: 1-31.

INTERNATIONAL COMMISSION OF ZOOLOGICAL NOMENCLATURE. 1999. **International Code of Zoological Nomenclature**. International Trust for Zoological Nomenclature, London, 4th edition. Available from: http://www.nhm.ac.uk/hosted-sites/iczn/code/. Accessed 16 Aug. 2011.

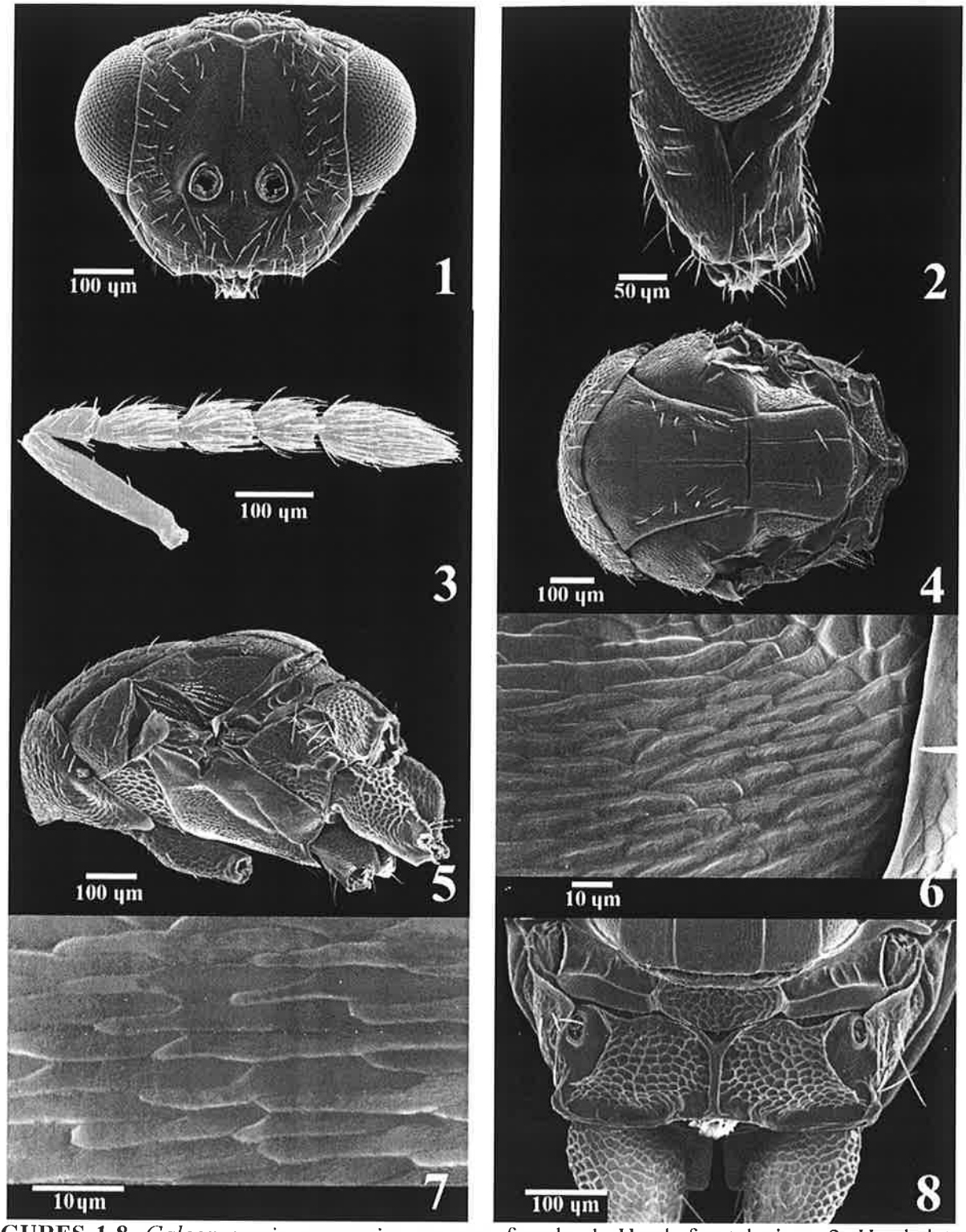
LASALLE, J. 1994. North American genera of Tetrastichinae (Hymenoptera: Eulophidae). **Journal of Natural History**, 28: 109-236.

LASALLE, J. & PEÑA, J.E. 1997. A new species of *Galeopsomyia* (Hymenoptera:

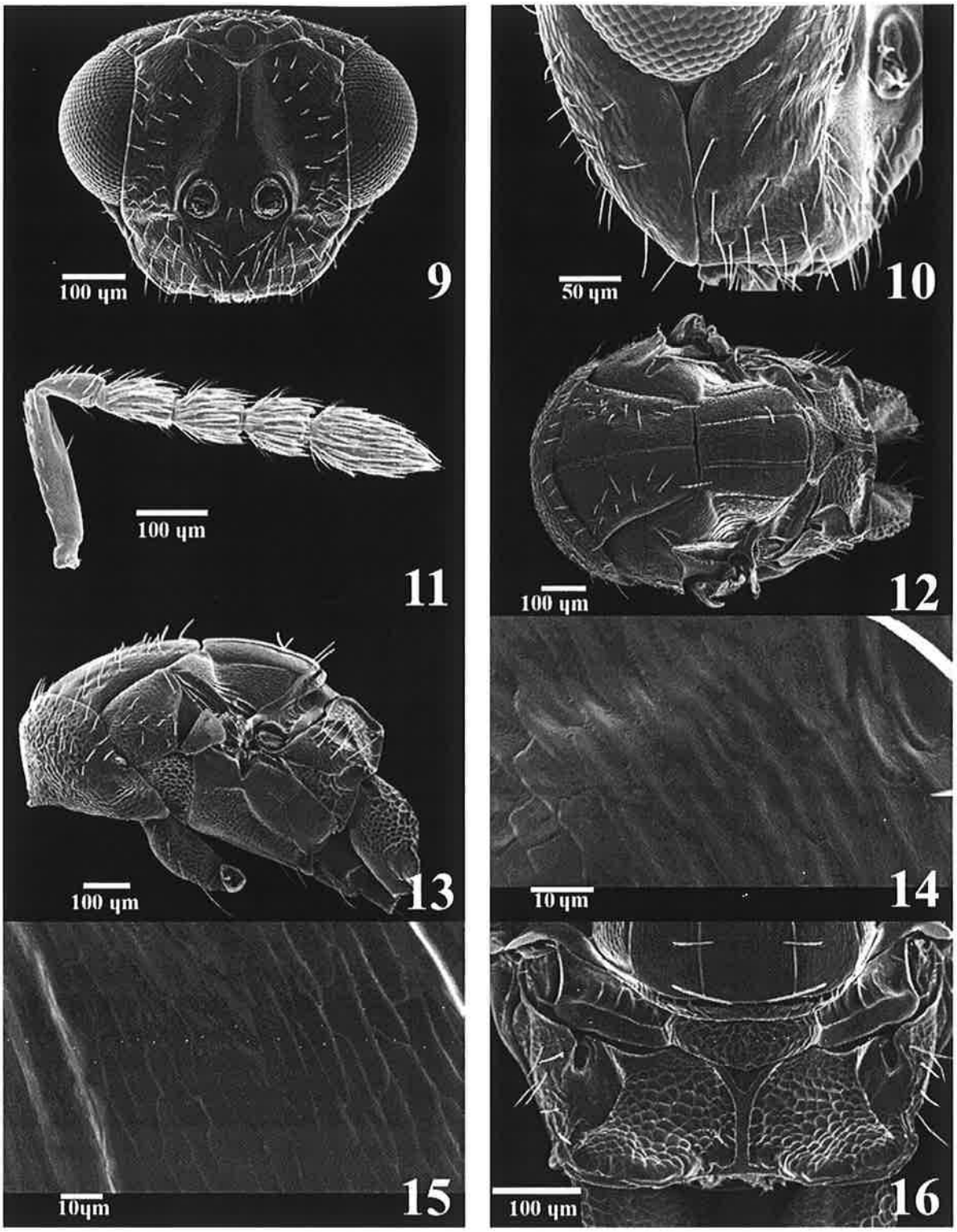
Eulophidae: Tetrastichinae): a fortuitous parasitoid of the citrus leafminer, *Phyllocnistis citrella* (Lepidoptera: Gracillariidae). **Florida Entomologist**, 80(4): 461-470.

NOYES, J.S. 2007. **Universal Chalcidoidea Database**. The Natural History Museum. Available from: <http://www.nhm.ac.uk/research-curation/projects/chalcidoids/>. Accessed 21 Aug. 2007.

PERIOTO, N.W.; COSTA, V.A.; LARA, R.I.R. 2007. Two new species of *Galeopsomyia* (Hymenoptera, Eulophidae) from Brazil. **Revista de Agricultura**, 82: 291-297.



FIGURES 1-8. *Galeopsomyia macaxeira* sp. nov. female. 1. Head, frontal view; 2. Head, lateral view; 3. Antenna; 4. Mesosoma, dorsal view; 5. Mesosoma, lateral view; 6. Mesoscutum, detail of sculpturing; 7. Scutellum, detail of sculpturing; 8. Propodeum.



FIGURES 9-16. *Galeopsomyia glypta* sp. nov. female. 9. Head, frontal view; 10. Head, lateral view; 11. Antenna; 12. Mesosoma, dorsal view; 13. Mesosoma, lateral view; 14. Mesoscutum, detail of sculpturing; 15. Scutellum, detail of sculpturing; 16. Propodeum.