

First occurrence of *Protapanteles (Protapanteles) enephes* (Nixon, 1965) (Hymenoptera, Braconidae, Microgastrinae) in Brazil and new biological data

Penteado-Dias, AM.^{a*}, Fernandes, LBR.^a, Iemma, LGR.^b and Dias, MM.^a

^aDepartamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos – UFSCar, CP 676, CEP 13 565-905, São Carlos, SP, Brazil

^bPrograma de Pós-Graduação em Ecologia e Recursos Naturais, Universidade Federal de São Carlos – UFSCar, CP 676, CEP 13 565-905, São Carlos, SP, Brazil

*e-mail: angelica@ufscar.br

Received July 12, 2010 – Accepted August 16, 2010 – Distributed August 31, 2011

(With 13 figures)

Abstract

Protapanteles (Protapanteles) enephes (Nixon, 1965) (Hymenoptera, Braconidae, Microgastrinae) was reared from the host *Fountainea ryphea phidile* (Geyer, 1837) (Lepidoptera, Nymphalidae, Charaxinae), collected on *Croton floribundus* Spreng. (Euphorbiaceae) in São Carlos, São Paulo state, Brazil. The hyperparasitoids *Conura* sp. (Hymenoptera, Chalcididae) and a Pteromalidae species are registered on this microgastrine species. Male and female specimens and cocoon of *Protapanteles (Protapanteles) enephes* are illustrated for the first time.

Keywords : hyperparasitoids, neotropical, Nymphalidae, parasitoids.

Primeira ocorrência de *Protapanteles (Protapanteles) enephes* (Nixon, 1965) (Hymenoptera, Braconidae, Microgastrinae) no Brasil e novos dados biológicos

Resumo

Protapanteles (Protapanteles) enephes (Nixon, 1965) (Hymenoptera, Braconidae, Microgastrinae) foi obtido do hospedeiro *Fontainea ryphea phidile* (Geyer, 1837) (Lepidoptera, Nymphalidae, Charaxinae), cujas larvas foram coletadas sobre *Croton floribundus* Spreng. (Euphorbiaceae) em São Carlos, estado de São Paulo, Brasil. Os hiperparasitoides *Conura* sp. (Hymenoptera, Chalcididae) e uma espécie de Pteromalidae são registrados sobre essa espécie de Microgastrinae. Espécimes machos, fêmeas e casulo de *Protapanteles (Protapanteles) enephes* são ilustrados pela primeira vez.

Palavras-chave: hiperparasitoides, neotropical, Nymphalidae, parasitoides.

1. Introduction

Microgastrinae is a large subfamily of Braconidae with more than 1500 described species (Shaw, 2006). *Protapanteles* Ashmead, 1898 currently contain 194 species in Palearctic and Neartic regions (Yu et al., 2005), placed in the *popularis* group by Nixon (1965). Whitfield et al. (2009) registered one specimen of this genus in Ecuador (South

America) on an unidentified caterpillar on a Solanaceae plant. Like all Microgastrinae, species of *Protapanteles* are koinobiont endoparasitoids of lepidopteran larvae. Known hosts for species of *Protapanteles* are larvae of Geometridae (Lepidoptera) of the Old World (Yu et al., 2005). Host use was previously unknown for this species and the first host record and other biological information are reported below.

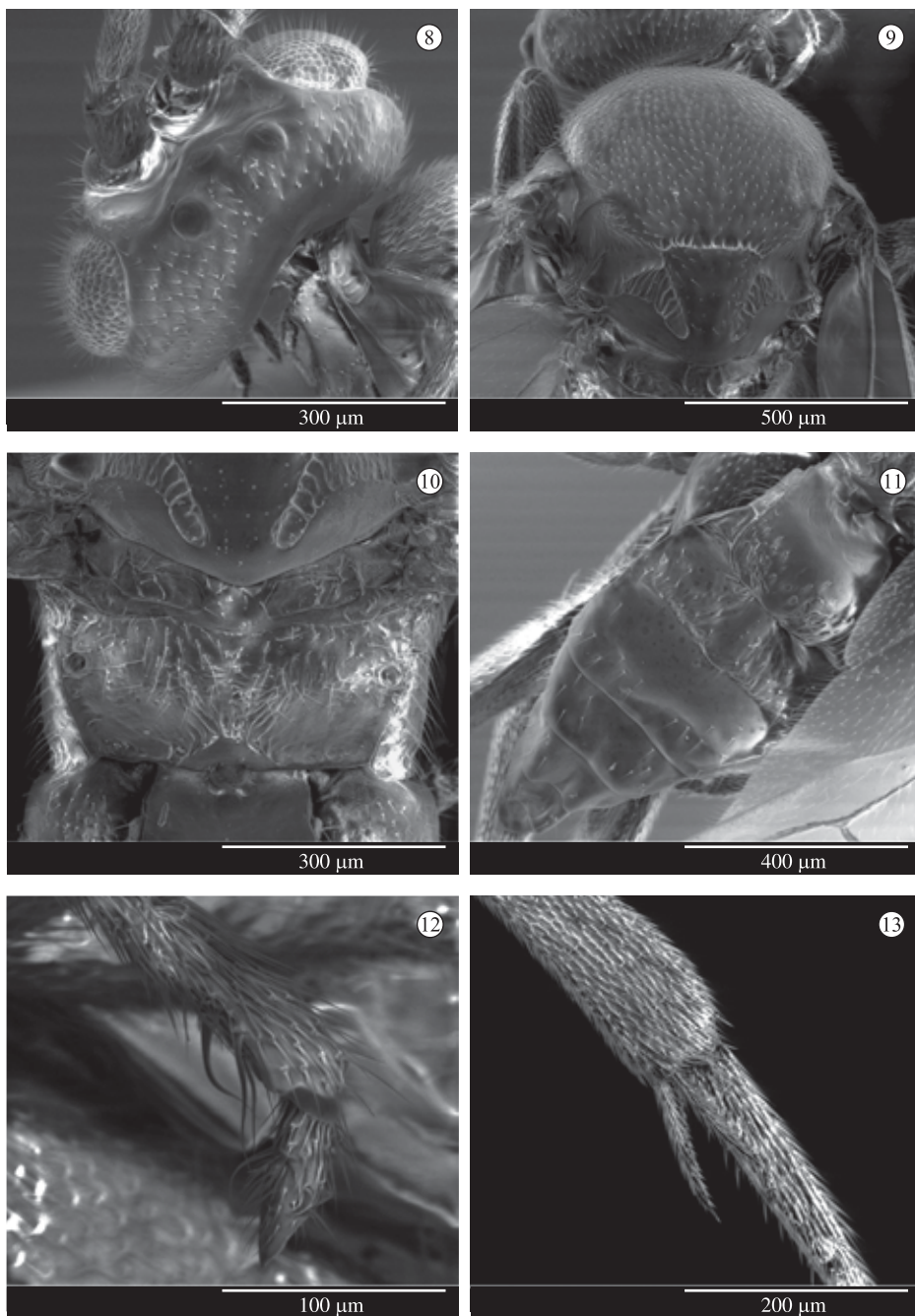


Figures 1-7. *Protapanteles (Protapanteles) enephes*. 1) habitus, male; 2) habitus, female; 3) head, lateral aspect; 4) male, dorsal aspect; 5) hind legs; 6) host larva on leaf; and 7) cocoon.

2. Material and Methods

Lepidoptera larvae were collected in Matão (Fazenda Cambuhy) and São Carlos (Fazenda Canchim, EMBRAPA and Parque Eco-Esportivo Damha) municipalities, state of São Paulo, Brazil, on *Croton floribundus* Spreng (Euphorbiaceae). In the laboratory they were kept individually in plastic containers with moistened filter paper discs and leaves of the host plant species. Containers were cleaned out, old leaves were removed, filter paper discs were remoistened,

and new leaves were added to each container several times per week throughout larval development. Each container, including parasitoids and host remains, was placed in a freezer when the parasitoids were observed to have emerged. After, the parasitoids were mounted and deposited in the collection of the Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos (DCBU), São Carlos, SP, Brazil. The lepidopterous remains were deposited in this collection also.



Figures 8-13. *Protapanteles (Protapanteles) enephes*. 8) head, dorsal aspect; 9) mesoscutum and scutellum; 10) propodeum; 11) metasoma; 12) female fore tarsus; and 13) spurs on hind tibia.

The Lepidoptera was identified by the last author; the first author identified the parasitoid as *Protapanteles (Protapanteles) enephes* using Nixon (1965), Mason (1981), Papp (1984) and Yu et al. (2005). The illustrations were made using the Automontage system in Leica stereomicroscope and MEV using a Quanta 250 microscope.

3. Results

Protapanteles (Protapanteles) enephes (Figures 1, 2, 4, 5) was reared from the host *Fountainea ryphea phidile* (Geyer, 1837) (Lepidoptera, Nymphalidae, Charaxinae) (Figure 6), collected on the host plant *Croton floribundus* Spreng (Euphorbiaceae). All were solitary koinobiont endoparasitoids. The adults emerged from yellowish cocoons, and were 3.4-3.8 mm in length, attached to median nervure of the leaves remains (Figure 7) and had a pupal period of nearly seven days. *Conura* sp. (Hymenoptera, Chalcididae) and a Pteromalidae species emerged as hyperparasitoid from the cocoon of *Protapanteles (Protapanteles) enephes*.

To identify the genus *Protapanteles* particular attention should be paid to smoothness of the propodeum (Figure 10) and laterodistal excavation of the female fore tarsus (Figure 12). *Protapanteles (Protapanteles) enephes* has the ocelli relatively large, posterior imaginary tangent to fore ocellus transecting deeply the hind pair of ocelli (Figure 8); notauli indistinct (Figure 9) propodeum rugo-rugulose (Figure 10), tergite I tending to be widened posteriorly and with the sculpture of its horizontal part intricated (Figure 11), inner spur of the hind tibia slightly longer than half basitarsus (Figures 5, 13), cheeks bright yellow to rusty (Figure 3).

Acknowledgements – We thank CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico), FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo) and INCT HYMPAR SUDESTE (Instituto Nacional de Ciência e Tecnologia dos Hymenoptera Parasitoides da Região Sudeste Brasileira) for financial support. We are also grateful to those responsible for the collection sites in allowing us access.

References

- MASON, WRM., 1981. The polyphyletic nature of *Apanteles* Foerster (Hymenoptera: Braconidae): a phylogeny and reclassification of Microgastrinae. *Memoirs of the Entomological Society of Canada*, vol. 115, p. 147.
- NIXON, GEJ., 1965. A reclassification of the tribe Microgasterini (Hymenoptera: Braconidae). *Bulletin of the British Museum (Natural History) (Entomology)*, Suppl. 2, p. 1-284.
- PAPP, J. 1984. A survey of the European species of *Apanteles* Forst. (Hymenoptera, Braconidae: Microgastrinae), VIII. The metacarpalis-, formosus-, popularis – and suevus-group. *Annales Historico-Naturales Musei Nationalis Hungarici*, vol. 76, p. 265-295.
- SHAW, SR., 2006. Familia Braconidae. In HANSON, PE. and GAULD, ID. *Hymenoptera del Neotrópico*. Memoirs of American Entomological Institute. p. 487-525. vol. 77.
- WHITFIELD, JB., RODRIGUEZ, JJ. and MASONICK, PK., 2009. Reared microgastrine wasps (Hymenoptera: Braconidae) from Yanayacu Biological Station and environs (Napo Province, Ecuador): Diversity and host specialization. *Journal of Insect Science*, vol. 9, p. 1-22. PMID:19613864. <http://dx.doi.org/10.1673/031.009.3101>
- YU, DS., van ACHTERBERG, C. and HORSTMANN, K., 2005. *World Ichneumonoidea. Taxonomy, Biology, Morphology and Distribution*. Vancouver: Taxapad. DVD/CD.