



Review of world *Parapanteles* Ashmead (Hymenoptera: Braconidae: Microgastrinae), with description of fourteen new Neotropical species and the first description of the final instar larvae

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Abstract

Currently only two Neotropical species are known for *Parapanteles* Ashmead (1900): *Parapanteles aletiae* (Riley), described from the U.S., Cuba and Puerto Rico, and *P. paradoxus* (Muesebeck), described from Costa Rica. In the present paper we describe 14 new species from the New World (*Parapanteles complexus* n.sp., *P. continua* n.sp., *P. em* n.sp., *P. lincolni* n.sp., *P. mariae* n.sp., *P. nephos* n.sp., *P. noae* n.sp., *P. polus* n.sp., *P. rarus* n.sp., *P. scotti* n.sp., *P. sicpolus* n.sp., *P. tessares* n.sp., *P. thrix* n.sp., *P. tinea* n.sp.) and provide an illustrated key for the world species. In addition, we present a synopsis of the ecology of species in the genus using new rearing records and previously published host records. Eighteen species in 11 lepidopteran families are known to be hosts for *Parapanteles* species, and these hosts feed on plants from 21 families totaling at least 43 species.

Key words: Braconidae, Microgastrinae, ecology, taxonomy, Neotropics, new species, host records

Introduction

The Neotropical microgastrine braconid wasp genus *Parapanteles* was proposed by Ashmead (1900) to include only the type species, *Parapanteles aletiae* (Riley). Muesebeck (1922) later synonymized *Parapanteles* under *Apanteles* Foerster, but Mason (1981) later resurrected the genus name and the species *Parapanteles paradoxus* (Muesebeck) in his revision of the genus *Apanteles* s.l. Since then only two additional species have been described: *P. masoni* Austin & Dangerfield from Australia (Austin & Dangerfield 1992), and *P. rooibos* Valerio, Whitfield & Kole from South Africa (Valerio *et al.* 2005).

Parapanteles has presented some problems for microgastrine generic and tribal classification due to its joint possession of the short “Macrolepidoptera Suite” ovipositor apparatus generally attributed to Cotesiini and Microplitini, along with possession of a medial propodeal areola characteristic of the Apantelini (Mason 1981). Mason placed *Parapanteles* among his Cotesiini, proposing a relatively early phylogenetic divergence within that tribe, but Williams (1985) found Mason’s placement difficult to reconcile with the existence of other, quite different, apparent phylogenetic transitional forms between Mason’s Cotesiini and Microplitini. Since the reanalysis of Mason’s phylogenetic work by Walker *et al.* (1990), Mason’s tribal divisions of Microgastrinae have been largely abandoned, but the placement of *Parapanteles* is still not well established. Recent molecular phylogenetic studies (Mardulyn and Whitfield 1999; Whitfield *et al.* 2002; Banks and Whitfield 2006) show a relatively close relationship with *Hypomicrogaster* Ashmead.

Taxonomically and biologically, the genus still appears to be poorly known, and the published records for *P. aletiae* are restricted to unidentified host caterpillars in the families Notodontidae and Noctuidae. According to Muesebeck (1958), *P. paradoxus* was reared from a species of *Hemiceras* sp. (Notodontidae) feeding on *Inga roussoviana* (Fabaceae). More recently, Jacobson (1991) in Perú reared some unidentified *Parapanteles* wasps from the arctiid larva *Carales astur* Cramer feeding on *Citrus* spp. (Rutaceae), broadening the host generic and family spectrum for the genus. In South Africa, *P. rooibos* is known to attack a geometrid moth, *Isturgia exerraria*, feeding on rooibos tea plants (Valerio *et al.* 2005). The diversity of host records suggests a relatively broad host range that may still be poorly sampled. The paucity of host records also reflects the taxonomically uncharacterized composition of the genus in the Neotropics (Mason 1981). The objectives of the present paper are to describe a number of recently reared *Parapanteles* species from the New World assembled from several large-scale rearing projects, and to present an updated key for the known species. A brief review of host use and geographic distributions is also provided, as are some comments about the taxonomy of the genus.

Material and methods

While DHJ is a coauthor of the paper, he explicitly prefers to not be a coauthor of the species names.