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Lycaenidae parasitoids from peninsular India with description of four new species of microgastrine wasps (Hymenoptera: Braconidae) along with new insights on host relationships

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Abstract

In the comprehensive rearing of lepidopterans from peninsular India, eleven species of Lycaenidae were parasitized by ten species of wasps. Four new taxa of lycaenid associated microgastrine wasps *Parapanteles eros* Gupta **n. sp.**, *P. arka* Gupta **n. sp.**, *P. esha* Gupta **n. sp.**, and *P. regale* Gupta **n. sp.** reared from *Chilades pandava* (Horsfield), *Curetis thetis* (Drury), *Prosotas dubiosa* (Semper), *Tajuria cippus* (Fabricius), respectively, are described with diagnostic details and illustrations along with documentation of six species of wasps *viz*., *Apanteles folia*, *Apanteles* sp., *Protapanteles* sp. 01 & 02 (Braconidae), *Charops obtusus obtusus* Morley (Ichneumonidae), and *Brachymeria lasus* (Walker) (Chalcididae). This is the first record of host-parasitoid association of lycaenid butterflies with *Parapanteles*. Wasps from three different families were recorded: Braconidae, Ichneumonidae, and Chalcididae. The parasitoid species were reared from the following Lycaenidae hosts: *Anthene lycaenina* (Felder), *Arhopala amantes* Hewitson, *Chilades pandava* (Horsfield), *Curetis thetis* (Drury), *Jamides celeno* (Cramer), *Prosotas dubiosa* (Semper), *Rathinda amor* (Fabricius), *Spindasis vulcanus* (Fabricius), *Tajuria cippus* (Fabricius), *Tarucus balkanicus nigra* Bethune-Baker, and *Tarucus callinara* Butler. All lycaenids were collected from peninsular India, except *T. callinara* (central India). A comparative account of all newly described species is provided along with the detailed illustrated description and differences vis-à-vis its closely allied Indian species. Also a comprehensive table comprising parasitoid species, associated host, stage of parasitism, and nature of cocoon is provided.

Key words: *Parapanteles*, parasitoid wasps, Microgastrinae, Lycaenidae, new species

Introduction

The genus *Parapanteles* was proposed by Ashmead (1900) with the type species, *Parapanteles aletiae* (Riley). From India, the genus has been documented with just two described representatives, *P. sireeshaae* Ahmad & Akhtar (Akhtar *et al*. 2010) and *P. echeriae* Gupta, Pereira & Churi (2013). *Parapanteles* has served as a model in developing phylogenetic patterns with multiple genetic markers across three trophic levels for understanding the relation between host shifts in resource use and diversification (Wilson *et al*. 2011).

In this study four new species of specific larval parasitoids are formally described *Parapanteles eros* Gupta **n. sp.**, *P. arka* Gupta **n. sp.**, *P. esha* Gupta **n. sp.**, and *P. regale* Gupta **n. sp.** along with their host relationships. All new species are parasitic on Lycaenidae caterpillars: *Parapanteles eros* **n. sp.**, a sexually dimorphic solitary parasitoid of *Chilades pandava* (Horsfield); *P. arka* **n. sp.**, a gregarious parasitoid of *Curetis thetis* (Drury); *P. esha* **n. sp.**, a solitary parasitoid of *Prosotas dubiosa* (Semper), and *P. regale* **n. sp.**, a solitary parasitoid of *Tajuria cippus* (Fabricius). In addition, six species of wasps, namely *Apanteles folia*, *Apanteles* sp., *Protapanteles* sp. 01 & 02 (Braconidae), *Charops obtusus obtusus* Morley (Ichneumonidae), and *Brachymeria lasus* (Walker)

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Material examined. ***Protapanteles*** **sp. 01**—One female, INDIA, Maharashtra, Chinchoti, Naigon, 25.i.2013, coll. Paresh V. Churi, ex. *Tarucus balkanicus nigra* on the host plant *Ziziphus mauritiana* Lam., NBAII//Bra/Prot/sp/25113. ***Protapanteles*** **sp. 02**—one female, Madhya Pradesh, Jabalpur, 10.vi.2013, coll. Ashok Sengupta, ex. *Tarucus callinara* Butler on the host plant *Ziziphus jujube* Mill., NBAII//Bra/Prot/sp/10613.

Remarks. Both the species were different but species identity could not be ascertained as single wasps were reared from their respective hosts.

Apanteles sp. (Hymenoptera: Braconidae)

Plate. XVIII (Figs 65−66).

Brief diagnosis. The genus can be identified with following characters: fore wing with second r-m vein absent, small areolet (second submarginal cell) open distally; hind wing with vannal lobe distally flattened and with reduced fringe of hairs; propodeum with oval, pentagonal, hexagonal or anteriorly open medial areola; first metasomal tergite usually with medial subapical depression and second metasomal tergite strongly transverse, often with convex or sinuate posterior margin; ovipositor and sheaths long and exserted; desclerotized hypopygium easily visible in some species.

Host. *Jamides celeno* (Cramer) on the host plant *Millettia* (= *Pongamia*) *pinnata* (L.) Panigrahi.

Material examined. One female, INDIA, Maharashtra, Chinchoti, Naigon, 17.viii.2013, coll. Paresh V. Churi, ex. *Jamides celeno* (Cramer) on the host plant *Millettia* (= *Pongamia*) *pinnata* (L.) Panigrahi, NBAII//Bra/Prot/sp/17813.

Remarks. Indian *Apanteles* needs thorough revision hence the species identity could not be confirmed, specimen being a singleton.

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