FIRST RECORD OF PARASITOID BRACHYMERIA EUPLOEAE WESTWOOD ON ACAREA TERPSICORE L.

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ABSTRACT

Life cycle stages of butterflies parasitized by natural enemies. Many species of Chalcid wasps are parasites of the pupae of many insects, especially the Brachymeria genus. During field visits, it has been observed that pupae of butterfly Acarea terpsicore (Linnaeus, 1758) are parasitized by the chalcid wasp Brachymeria euploeae (Westwood, 1837). Pupae that become infested are blackish and their activity does not resemble that of normal pupae. The record of B. euploeae as a parasitoid is not only the first record on pupae of A. terpsicore but also for Maharashtra, India.

Key words: Lepidoptera, butterfly, Acarea terpsicore, pupa, natural enemy, parasitoid, chalcid, Brachymeria euploeae.

Lizards, birds, spiders and predatory insects are the most common enemies of butterflies. Life stages- egg, larva and pupa of butterflies are attacked by parasitoids, mainly by hymenopteran wasps and dipteran flies (Haribal, 1992). Butterflies support a range of parasites like wasps (Blakhe and Ogale, 2018). According to Nacua et al. (2020), natural enemies affect the entire life cycle of the butterflies from egg, larva, pupa and adult. The butterfly Acarea terpsicore (Linnaeus, 1758) is ochreous orange with a black border at the margins of the wings (Noor et al., 2021). According to Sheela et al. (2003) multiple parasitism, super parasitism and hyper parasitism are very common among chalcids and larvae of chalcids are entomophagous parasites. Brachymeria species cause high mortality of a few butterfly species and are considered as one of the biological controlling agents (Santosh and Basavarajappa, 2017). A parasitoid Brachymeria euploeae (Westwood, 1837) is a common species parasitizing various Lepidoptera (Sureshan, 2009). In the present study, B. euploeae is recorded for the first time as a pupal parasitoid of the butterfly A. terpsicore.

MATERIALS AND METHODS

A sampling of infested pupae of A. terpsicore was done in April and May 2022 and observations were made on parasitoids in the Department of Zoology, Shivaji University, Kolhapur. The identification of emerged parasitoids was done by following Narendran (1989) and Narendran and Achterberg (2016). Photography of emerged parasitoids was done under a stereozoom microscope (Lynx LM-52-3621) with an attached camera. The photos were stacked in Helicon Focus 7 software. Stacked photos were edited in Photoshop C53. For the measurement of length IMAGE J software is used.

RESULTS AND DISCUSSION

During regular visits to study the life cycle of the butterfly Acarea terpsicore (Linnaeus, 1758), it was observed that some pupae became blackish and were not showing normal activity. Such pupae were collected and kept under observation in the laboratory and found that a single black-bodied, about 5 mm long, grey-eyed and 11 segmented antennal parasitoid emerged from the pupa of A. terpsicore after 10 days by making an exit hole on 5th May 2022. (Fig. 1c). This parasitoid was identified as Brachymeria euploeae (Westwood, 1837) (Hymenoptera: Chalcididae) (Fig. 1c) based on swollen hind femora (Fig. 1d, e) which is distinguishing character of the family Chalcididae (Sheela et al., 2003) Besides, apices of all femora, fore and mid tibiae and all tarsi pale yellow; wings are hyaline with dark brown veins, hind tibia yellow with a black base (Joseph et al. 1973, Narendran and Achterberg, 2016). The record of B. euploeae is not only the first record on pupae of A. terpsicore but also for Maharashtra, India.

According to Shaw et al., (2009), wasps from the family Chalcididae attack the pupal stage of European butterflies. Several Brachymeria (Chalcididae) attack the pupae of Erionota species including B. albotibialis, B. lasus, B. thracis and B. euploeae (Waterhouse and Norris, 1989). In India, B. euploeae so far known
from Kerala (Sureshan, 1999), Andamans and Tripura (Sheela et al., 2003) as a first report, Arunachal Pradesh, Bihar, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Manipur, Odisha, Punjab, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal (Narendran, 1989). Considering the states mentioned above and as this species is not mentioned in the fauna of Maharashtra published in 2012 and a checklist of Chalcididae (Binoy et al., 2021), the record of this species from the present study is new to Maharashtra. Hosts of *B. euploeae* are from the family Nymphalidae and various Lepidoptera which are crop pests (Narendran, 1989; Sureshan, 2009) and is a hyperparasitoid in the family Nymphalidae (Narendran and Achterberg, 2016). Gowri et al., (2016) newly recorded *B. euploeae* as a pupal parasitoid from Manipur, Mizoram and Nagaland without mentioning the name of the host. The present study reports a similar observation i.e. parasitism of *B. euploeae* on the nymphaeid butterfly *A. terpsicore*. The *B. euploeae* also attack on butterfly pupae of the banana pest *Erionota thrax* (banana skipper) (Waterhouse and Norris, 1989) and the Rice green moth, *Latoia bicolor* from rice growing zones of Tamil Nadu, India (Daniel and Ramaraju, 2017). There are some other species of *Brachymeria* genus which are reported as a parasitoid of different insects like *Brachymeria albobibialis* a pupal parasitoid of the banana skipper (*Erionota thrax*) (Okolle et al., 2008), *Brachymeria albicrus* a pupal parasitoid of *Pieris rapae* (Hasanshahi et al., 2013), *Brachymeria tibialis* a pupal parasitoid of butterfly *Aporia crataegi* (Obregon et al., 2015), *Brachymeria jambolina* a pupal parasitoid of *Graphium doson* and *Euploea core* (Santhosh and Basavarajappa, 2017). Basak et al. (2020) recorded *Brachymeria burksi* on *Aspidomorpha miliaris* (Coleoptera: Chrysomelidae) and *Brachymeria podagrica* on different species of Diptera and Lepidoptera. Kaplan and Yildirim (2022) described a new species of Chalcididae, *Brachymeria zelihae* from Turkey. Prasanthi et al. (2023) recorded *Brachymeria excarinata* as a hyperparasitoid of *Charops bicolor* (Hymenoptera: Ichneumonidae) from India for the first time. As this species is a natural enemy of many lepidopteran insects and is not popular in the IPM and hence can be used as a biocontrol agent against lepidopteran crop pests.

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**AUTHOR CONTRIBUTION STATEMENT**

SMG is involved in the design of the research, identification of specimens and writing up the manuscript. ANP collected, reared, identified and gathered biological data of species under study.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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