

**NEW RECORD OF *BRACHYMERIA TIBIALIS* (WALKER)  
(HYMENOPTERA: CHALCIDIDAE) ON *CRICULA*  
*TRIFENESTRATA* (HELPER) FROM INDIA**

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**[Tikader, A. 2012. New record of *Brachymeria tibialis* (Walker) (Hymenoptera: Chalcididae) on *Cricula trifenestrata* (Helfer) from India. Munis Entomology & Zoology, 7 (1): 222-225]**

**ABSTRACT:** *Brachymeria tibialis* (Walker), belongs to the family Chalcididae is commonly known as chalcid fly. *Brachymeria tibialis* Walker, a parasitoid recorded on *Cricula trifenestrata*, (Lepidoptera: Saturniidae), during grainage operation in 2010-2011. The parasitoid damages and eats the pupae inside the cocoon to restrict the population for future generation. The literature cited indicates that the occurrence of *Brachymeria* is the first record on wild silkworm *Cricula* in India. The manuscript highlights the detail report of new parasitoids on *Cricula*.

**KEY WORDS:** *Brachymeria*, parasitoid, new record, *Cricula*, silkworm, wild.

The wild silk moth *Cricula* is widely distributed in the Indian Sub-continent, thriving on different host plant. It is abundantly available in North-eastern region particularly in Assam (Tikader, 2011). North-east India is the centre of wild silk culture and commercially exploited mulberry, eri, muga, tasar and oak tasar silkworm. The other wild silk varieties available e.g. *Actias selene*, *Antheraea roylei*, *Antheraea* spp. novo, *Attacus atlas*, *Samia canningi*, *Cricula trifenestrata*, *Loepa sikkima* etc. are available in nature (Chutia et al., 2010). The *Cricula* is a silk producing insect but considered as pest of muga silkworm host plants (Sarmah et. al., 2010). The insect is also termed as pest of mango, (Ahmad & Alam, 1993), cashew (Pal & Medda, 2006), som and soalu plants (Tikader, 2011). The report of pest, parasites and predators was highlighted in muga food plants and silkworm where *Brachymeria* and *Cricula trifenestrata* is termed as Chalcid fly and defoliating insect (Singh & Das, 1996). The *Brachymeria* is found to be parasitoids of *Cricula trifenestrata* and is the first report from this region. The detail study of *Brachymeria* parasitoid on *Cricula* is not available. The present study of *Brachymeria*, a parasitoid on *Cricula* is recorded and presented in this paper.

### **MATERIALS AND METHODS**

Fifty *Cricula* cocoons each was collected from different host plants i.e., mango, *Magnifera indica* Lin. (Family: Anacardiaceae), black berry, *Syzygium cumini* (L) Steels, (Family: Myrtaceae), cashew, *Anacardium occidentale* Lin. (Family: Anacardiaceae) and Indian olive, *Elaeocarpus floribundus* Blume (Family: Elaeocarpaceae) and kept for observation on grainage behaviours. The cocoons were collected after rearing from October-November 2010. After a period of 5 months pupal diapause the moth emerged out during March 2011. The photographs of the good cocoon and damaged cocoon were taken. The hole on the cocoon and pupae was also taken. The detail observation recorded during emergence of moth.

## RESULTS AND DISCUSSION

Out of 200 cocoons kept for grainage, 50 cocoons were damaged which is about 25% of total cocoons. During moth emergence, some of the cocoons were found damaged and pierced with small hole. The pupa was eaten by the parasitoid and makes a hole on it. The adult form of *Brachymeria* emerged out from cocoon and moved here and there. After close observation, it was found that in one cocoon about 10-15 insect available. The insect was identified as *Brachymeria tibialis*, a parasitoid. The maximum cocoon was damaged in olive plant.

The characteristic feature of *Brachymeria* are distinguished by a head with frons somewhat flattened; antennae inserted at or above level of ventral eye margin; margin vein touches wing margin; hind tibia acute, ventroapically forming sharp projection; mid tibia have single apical spur. The adults develop in lepidopterous pupae and emerge by biting away a hole at the anterior end, in a wing pad, or at the middle of the dorsum of the pupal shell. Adults of species attacking carrion-infesting hosts are believed to derive a part of their food from the meat juices, and feeding on the hosts fluid has been observed in *B. tibialis*. The parasitoids of Lepidoptera oviposit in young pupae. Adults are relatively long-lived in most species. *B. tibialis* survives in winter and a considerable portion of the following season. The life cycle from egg to adult is having one generation. Only female of *B. tibialis* hibernate which parasitize *Lepidoptera*. A portion of the females of the early broods may also carry over the winter. The habits and availability of hosts determine the number of generations produced each year. *B. tibialis* may have two generations and a partial third by utilizing several host species. Sex appears to occur in about equal number, based on current information. The eggs of the majority species of the family are elongated and broadest at the anterior end, with both ends smoothly rounded and the length is four to six times the maximum width. Egg incubation is completed in 2-3 days in all species of *Brachymeria*. The first instar larvae are caudate and endoparasitic in lepidopterous pupae. The second instar larva is more robust and in the caudate form the tail persists though reduced in size. The third instar larvae show a further convergence of the two forms. The fourth instar larva presents no distinctive features. The fifth instar of *Brachymeria* is oval in outline, distinctly segmented and yellowish white in colour. *Brachymeria tibialis* developed in lepidopterous pupae partially consume the pupa which contains sufficient foods for several parasitoids. Only one parasitoid individual develops to maturity. The semi fluid surplus is usually in the abdomen for parasitoid feeding is limited to the anterior portion of the pupa, and in smaller host individuals it dries out quickly. Most of the Hymenoptera is easily recognized as belonging to the order because of their "wasp waists". The constricted waist characterizes ants, wasps, parasitic and bees in the sub order Apocrita. It varies from minute parasitoids of other insect eggs up to huge wasps and bees but all have the wasp waist. The species of *Brachymeria* are common and widely distributed throughout the world (Askew & Shaw, 2001). The Chalcidids are a moderately sized family with circa 115 valid genera and 1415 species (Fry, 1989). The *Brachymeria* was reported from Madagascar as parasite on *Anomis flava* (Steffan, 1958). They are cosmopolitan but are most abundant in the tropics.

Narendran (1986) noted that the family *Chalcididae* comprises medium to large chalcids whose hind femur is greatly modified into a swollen structure. These chalcids are important and interesting but also difficult parasitic insects to study taxonomically. All the species of *Brachymeria* develop as parasite on various other insects, mainly in their pupae. The natural enemies like *Lymantria*

*obfuscate* was reported from Kashmir and India (Massod et al., 1986; Dharmadhikari et al., 1985). This family is cosmopolitan in distribution and is represented most commonly by the genus *Brachymeria*. It is primary or secondary parasitoids of *Lepidoptera*, *Diptera*, *Coleoptera* and also *Trigonura* and *Phasgonophora* (Boucek, 1992). Few species have been utilized in biological control, and none has shown any marked degree of effectiveness. One species of *Brachymeria* has been introduced to the United States for gypsy moth control with moderate success (Williams et al., 1993).

The parasitoid like *Brachymeria* suppresses the population of host to a considerable limit to maintain balance in nature. The observation of *B. tibialis* on *Cricula* is the new report. More work is required to verify the feasibility to utilize the *B. tibialis* parasitoid as biological control of muga silkworm.

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Figures 1-7. *Brachymeris tibialis* Walker, 1. Adult parasitoid on leaf, 2, 3. Parasitoid enlarged dorsal view, 4. Parasitoid ventral view, 5. *Cricula* cocoon, 6. Hole in *Cricula* cocoon, 7. Hole in pupa of *Cricula*.