Diachasmimorpha (Biosteres) longicaudata (Ashmead): A potential parasitoid for biocontrol of fruit flies, Bactrocera spp. in Punjab

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ABSTRACT: Field surveys were conducted in Punjab to explore the potential biocontrol agents of fruit flies, Bactrocera dorsalis (Hendel) and B. zonata (Saunders) on fruit crops like peach, pear, guava, mango, Kinnow mandarin and plum. Parasitoid, Diachasmimorpha (Biosteres) longicaudata (Ashmead) was recovered from maggots and pupae of fruit flies among infested fruits in large numbers.

Keywords: Diachasmimorpha (Biosteres) longicaudata, Parasitoid, Punjab, Tephritids

Fruit flies, Bactrocera dorsalis (Hendel) and B. zonata (Saunders) are important insect-pests of fruit crops in Punjab. Important host plants of B. dorsalis are mango, guava, peach, citrus, pear, ber and loquat but most preferred host of B. dorsalis is guava while that of B. zonata are guava, peach, mango, pear, ber, citrus and loquat (Singh et al., 2016). Fruit flies are very difficult to manage due to the fact that they are polyphagous, multivoltine, adults have high mobility and fecundity and all the development stages are unexposed. Present management strategies mostly focus on chemical insecticides. Due to cryptic nature of the maggots and eggs, they mostly remain unaffected by insecticides and only adults are exposed to control measures. So, most of insecticidal treatments are ineffective. Furthermore, application of insecticides disrupts the ecosystem and causes numerous hazards, which in present scenario warrants the need of integrated approach for eco-friendly management of these fruit flies (Singh and Kaur, 2016), including use of biological control agents.

To explore the biological control agents of fruit flies, fruit fly infested fruits of peach, plum, pear, guava, mango and Kinnow mandarin were collected from the respective orchards throughout the Punjab State and brought to Fruit Entomology Laboratory in the Department of Fruit Science, Punjab Agricultural University, Ludhiana during 2012-2015. Solitary braconid endo-parasitoid wasps, Diachasmimorpha (Biosteres) longicaudata (Ashmead) (Hymenoptera: Braconidae) were recovered from maggots and pupae of fruit flies from these host fruits. These wasps were observed to possess long tails. The parasitoid wasps lay their eggs inside the maggot of fruit flies with the help of their elongated ovipositor to reach the maggot inside the fruit, and develop on the maggot inside the fruit, spin a cocoon and emerge as an adult wasp from the cocoon. When the fruit fly is in pupal stage, the egg of the wasp hatches and larva begins feeding on pupa of fruit fly, killing the fruit fly before it can develop into an adult. The number of parasitoids ranged between 15-20 adults per 100 fruit of peach, pear, plum, mango, guava and Kinnow. Highest number of parasitoids were recovered from guava > mango > pear > Kinnow > peach > plum.

During collection of infested fruits from the orchards, large numbers of parasitoids were observed sitting on fruit fly infested mango fruits (Fig. 1 and 2) in the orchard at Fruit Research Station, Gangan, District...
ACKNOWLEDGEMENTS

The author is thankful to Dr. V.V. Ramamurthy, IARI, New Delhi for earlier identifying the parasitoid as

**Biosteres (Chilocaudatus) longicaudatus** (Ashmead) and Dr. Ankita Gupta, National Bureau of Agricultural Insect Resources, Bengaluru, Karnataka and Dr. J. Poorani, National Research Centre for Banana, Trichy, Tamil Nadu for confirming the name as **Diachasmimorpha longicaudata** (Ashmead).

REFERENCES


*MS Received : 30 May 2016
MS Accepted : 15 June 2016*