

# Ecological Traits in Fortuitous Biological Control of Oriental Fruit Fly, *Bactrocera dorsalis* (Diptera: Tephritidae) Infesting Guava Fruits in Northeast India

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**Abstract**—The northeastern region of India has enormous potential for the production of fruits and vegetables. Fruit flies of the genus *Bactrocera* Macquart (Diptera: Tephritidae) are important pests of fruits and cause huge losses in marketable yield. The fruits are export oriented horticultural commodities, and fruit flies are also a great concern for international and domestic quarantine agency. Due to distinct winter in Meghalaya, guava trees produces fruit only once in a year i.e. during rainy season, which is more prone to fruit fly infestation. Thus, fruit fly problems are difficult to manage during rainy season even by using chemicals. Ecological understanding of seasonal incidence, parasitoid complex, natural parasitism and pest-weather relationship are pre-requisites for developing effective IPM strategies. Natural enemies play an important role in the management of insect pests under field conditions. Different agro-ecosystems of the NEH region harbour several natural enemies and many of them may have the potential to reduce fruit fly population when combine with other management strategies. Information on these aspects is however limited for this region and even for the country. In this backdrop, the present study was conducted during 2015 to 2018 to generate this essential information. We recovered total six species of parasitoids from the infested guava fruits in Meghalaya. Except two species of genus *Asobara*, the remaining four parasitoid species were emerged from *B. dorsalis* pupae as primary parasitoids. A total of 1167 parasitoids were recovered from 9644 puparia of *B. dorsalis*. The figitini cynapid parasitoid, *Aganaspis daci* was ranked first among four emerged species throughout the season. Considering the share of each species in parasitism, the wasp, *A. daci* was the most dominant species over the season. Eco-biological traits mainly number of maggots/fruit, weight of puparia (mg) and their natural field parasitism (%) were studied on eight different varieties. Significance differences were found in maggot density ( $F=53.86$ ,  $p<0.01$ ), weight of puparium ( $F=2.76$ ,  $p=0.02$ ) and its field parasitism ( $F=16.46$ ,  $p<0.01$ ). Numbers of maggots per fruit were significantly higher in guava variety Allahabad Safeda (29.20); while weight of puparia and natural field parasitism was higher in variety RCGH-7 (12.15g and 18.29%, respectively). Bio-control performance of all four parasitoids was also determined in different varieties based on share of parasitoids in total parasitism. This study concludes that the agro-ecosystems of northeast India harbour several natural enemies of fruit fly *B. dorsalis* and the dominant parasitoid species can be effectively utilized for their management. Package of practices of the crops also need necessary modifications for conservation of this beneficial fauna.