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Differential Immuno-Suppressive Ability of Different Morphotypes of the Invasive Fruit Fly *Bactrocera invadens* towards Eggs of the Parasitoid *Diachasmimorpha longicaudata*

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Abstract

In 2003, the Asian fruit fly *Bactrocera invadens* Drew, Tsuruta & White (Diptera: Tephritidae) was first reported in Africa. This insect is an invasive species that is to date considered to be among the major pests of mango in Sub Saharan Africa. Being an alien pest and lacking indigenous parasitoid species, the use of introduced parasitoids against *B. invadens* may be a promising pest management strategy. One key factor for the success of such classical biological control programs is the physiological compatibility between the parasitoid and the target pest. Preliminary work indicated that *B. invadens* exhibits a differential ability of immuno-suppression against the introduced endoparasitoid *Diachasmimorpha longicaudata* (Ashmead) (Hymenoptera: Braconidae). Within the population of *B. invadens* there are eight distinct morphotypes based on the pattern of the scutum. We hypothesised that the intraspecific variability in encapsulation ability is related to these different morphotypes. Four major morphotypes have been evaluated for the ability to encapsulate *D. longicaudata* eggs. The total and differential haemocyte counts and number of encapsulated and non-encapsulated parasitoid eggs for the parasitized fly larvae were recorded at different time intervals after parasitisation, for each morphotype. The haemocyte counts were compared with that of unparasitized larvae of the same age as that of the parasitized ones. Additionally, the impact of parasitoid adaptation to the host has been investigated by recording the number of encapsulated and non-encapsulated eggs of consecutive generations of *D. longicaudata* reared on *B. invadens*. The potential use of this parasitoid species in classical biological control of *B. invadens* will be discussed.

Keywords: *Bactrocera invadens*, *Diachasmimorpha longicaudata*, immuno-suppression