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Dolichogenidea tasmanica papers published

These papers aimed to establish some key parameters of the parasitoid:host dynamics for *Dolichogenidea tasmanica* attacking larvae of the highly polyphagous light brown apple moth. This information is important for understanding whether *D. tasmanica* would be suitable for use as a biocontrol agent under commercial conditions (e.g., in vineyards).

1. Host discrimination by the solitary endoparasitoid *Dolichogenidea tasmanica* (Hymenoptera: Braconidae).

ABSTRACT

Successful parasitism of a host partly depends on a female's assessment of its quality, including whether the host has already been parasitised or not. We conducted experiments to elucidate host discrimination by *Dolichogenidea tasmanica* (Hymenoptera: Braconidae). It is the most commonly collected parasitoid of light brown apple moth, *Epiphyas postvittana* (Lepidoptera: Tortricidae). To assess the rate of superparasitism avoidance by *D. tasmanica*, female wasps were given choices between (1) unparasitised hosts versus freshly self-parasitised hosts, (2) unparasitised hosts versus hosts at 24 h post-self-parasitisation and (3) freshly self-parasitised hosts versus hosts freshly parasitised by a conspecific female. Results confirm that host discrimination occurs in *D. tasmanica*. Females avoid laying eggs in hosts that have been parasitised by themselves or conspecifics, even though the frequency of first encounter with either an unparasitised or a parasitised host was the same for all choices. Thus, it appears that females are not able to discriminate the host parasitisation status prior to contacting a host, but host acceptance is not random. Host discrimination is time-dependent, with greater avoidance of superparasitism after 24 h. The ability of female *D. tasmanica* to distinguish healthy from parasitised hosts suggests that it could be an effective biological control agent in regulation of host populations. It should also ensure production efficiency in parasitoid mass rearing.

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2. Host stage preference of *Dolichogenidea tasmanica* (Cameron, 1912) (Hymenoptera: Braconidae), a parasitoid of *Epiphyas postvittana* (Walker, 1863) (Lepidoptera: Tortricidae).

ABSTRACT

Epiphyas postvittana (Walker, 1863), or light brown apple moth (LBAM), is a highly polyphagous native Australian species and a major insect pest in Australian vineyards. *Dolichogenidea tasmanica* (Cameron, 1912) is the most abundant parasitoid of the larval stages of LBAM. The prime objective of our study was to determine the parasitism success of *D. tasmanica* on different larval stages of *E. postvittana*. Additionally, we aimed to find out if larval head capsule width could be used to determine the instar number by examining the variability in head capsule size of each instar of LBAM and the effect of rearing temperature on larval head capsule size. To determine which of the first three larval stages of LBAM parasitised is most effectively by *D. tasmanica*, choice and no-choice tests were conducted in a wind tunnel. Head capsule widths varied with rearing temperature, especially in the final fifth or sixth instar. We showed that the ranges of head capsule widths overlaps between successive instars three through six, which makes it impossible to distinguish these instars of LBAM using head capsule size alone. We showed that first, second and third instars of LBAM are parasitised by *D. tasmanica*. No-choice and choice tests revealed that there are significant differences in parasitism among the three susceptible instars, with the highest percentage of parasitism found in second instars in no-choice and choice tests (65.1% and 65.8%, respectively) compared with first instars (61.1% and 45.1%) and third instars (27.3% and 37.5%). Wasps developed faster in third instars, but the wasp female's size was not significantly different among the instars attacked. These data confirm that *D. tasmanica* is capable of parasitising early larval instars, which is important for minimising damage through biological control.

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