

8th International Symposium on Fruit Flies of Economic Importance (ISFFEI 2010), Valencia, Spain, 26th September - 1st October 2010

Effects of intraspecific competition on the larval development and pupal weight of Dacini (Diptera : Tephritidae) infesting cucurbits in La Réunion

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Background. In La R  union, cucurbit crops suffer considerable damage due to fruit fly attacks. A complex of three species (The Melon fly, *Bactrocera cucurbitae*, The Ethiopian fly, *Dacus ciliatus*, and the Indian Ocean fruit fly, *Dacus demmerezi*) coexist in the island and can infest 16 different species of Cucurbitaceae. In order to develop sound and sustainable management methods for these pests, we need to know more about their behavior and ecology. The objective of this study is to clarify the interaction existing at larval stage, and particularly the competition which may occur between conspecific larvae in a same fruit. According to earlier studies, squash (*Cucurbita pepo*) was chosen for laboratory experiments because it is one of the most damaged cultivated cucurbit in La R  union.

Methods. To measure the effect of intraspecific competition on the survivorship rate of larvae and on the pupal mass, infestations of squash were carried out in the laboratory with L1 larvae of *B. cucurbitae*, *D. ciliatus* or *D. demmerezi*, obtained from lab rearing.

Five levels of infestation were selected e.g. A) One larva (L1) for two grams of squash, B) One larva/1 g, C) Two larvae/1 g, D) Four larvae/1 g and E) Eight larvae/1 g. Each level was replicated five times. Four days after infestation, pupae were collected daily, weighed individually and grouped by weight classes in a same box and when they emerged, the adults were sexed.

Results. Larvae of *B. cucurbitae* and *D. demmerezi* don't have the same response to an increase of intraspecific competition in a same fruit. Larvae of the first species show a good survivorship level (63% for level D) whereas larvae of *D. demmerezi* are more affected by a high level of competition (18% for level C). On the contrary, pupal weight of *B. cucurbitae* clearly decreases when the number of larvae increases in the fruit while pupal weight of *D. demmerezi*, does not seem to be affected by intraspecific competition.

Conclusion. It seems that, in the complex of Dacini attacking cucurbits, the species do not have the same strategy regarding intraspecific competition. The larvae of *B. cucurbitae* are able to share resources and maintain a good survivorship finally giving more adults with low weight. Conversely, in *D. demmerezi* larval survivorship is decreased but the pupal weight of survivors remains high. Further studies will be needed on larval interspecific competition in this complex of fruit flies, in order to understand the performance of each species in situations of co-infestation.

Key Words: larval intraspecific competition, La Réunion, Dacini, Cucurbita pepo