HOST PLANT RANGE OF A FRUIT FLY COMMUNITY (DIPTERA: TEPHRITIDAE): LARVAL PERFORMANCE IN RELATION TO FRUIT COMPOSITION

A. HAFSI[1,2], B. CHERMITI[2], B. FACON[3], V. RAVIGNÉ[1], S. QUILICI[1] and P.F. DUYCK [1]

[1]UMR, Peuplements Végétaux et Bio-agresseurs en Milieu Tropical, CIRAD Pôle de Protection des Plantes, 7 chemin de l'Irat, 97410 Saint Pierre, La Réunion, France
[2]Institut Supérieur Agronomique de Chott-Mariem, laboratoire d'Entomologie et de Lutte Biologique, Université de Sousse, 4042, Sousse, Tunisie
[3]UMR, Centre de Biologie pour la Gestion des Populations, INRA-SPE, 755 Avenue du Campus, Agropolis, CS 30016, 34988 Montferrier sur Lez, Cedex, France
abir.hafsi@cirad.fr

The family Tephritidae is able to infest a large number of host plant species. Some tephritid species are highly polyphagous, while others are stenophagous or even strictly monophagous. The host fruit affects the larval development (with potential huge impact on adult fecundity). In this study we established the relationship between available nutrients in fruits and the host specialisation of seven tephritid species in La Réunion. Three life history traits (survivorship, developmental duration and pupal weight) were studied in the laboratory for each of the 22 fruit species occurring in La Réunion. In addition, data on the nutritional composition for all the studied fruits was gathered from existing databases. The three life-history traits differ significantly depending on the fruit species. *Bactrocera zonata*, *Ceratitis catoirii*, *C. rosa* and *C. capitata* were able to survive on a larger range of fruits compared with the three other species that have a more narrow host range. Pupal weight was significantly correlated to the larval duration for *Ceratitis catoirii*, *C. capitata*, *Bactrocera zonata*, *B. cucurbitae,* and *Neoceratitis cyanescens*. Co-inertia analyses on the relationship between fruit nutrients composition and survivorship of Tephritidae showed that the polyphagous fruit flies (*B. zonata*, *C. catoirii, C. rosa* and *C. capitata*) survived better in fruits with higher level of carbohydrate than oligophagous fruit flies (*B. cucurbitae*, *Dacus demmerezi* and *N. cyanescens*). This study also allows us to define the fundamental host range of the different tephritid flies which is particularly crucial to predict and prevent their invasion.

Keywords: Tephritidae, nutritional composition, carbohydrate, food webs, fundamental niche