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EFFECT OF BIOTIC AND ABIOTIC FACTORS ON TRAPPING OF ADULTS OF THE MEDITERRANEAN FLY

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Abstract: The Mediterranean fruit fly (medfly), *Ceratitis capitata* (Diptera: Tephritidae) is one of the most important pests of fruit commodities worldwide. Due to ever expanding human travel and global trade of fresh fruits, medfly has invaded many tropical, subtropical and temperate regions of the globe. The main tool for early detection of invasive *C. capitata* populations and of monitoring the dispersion patterns of established ones is adult trapping. Trapping efficacy is affected by a set of biotic and abiotic factors, such as the prevailing climatic conditions, physiological and demographic aspects of the target population (e.g. age and reproductive structure of feral flies) and the trapping system considered. We explored whether the: 1) acclimation of adults in different temperatures, 2) prevailing climatic conditions and 3) host type (host and non-host plants) affect captures of adults of the Mediterranean fly, in traps in open field conditions.

We used the progeny of a wild population originated from the area of Volos reared in laboratory conditions for 3 to 6 generations. Two days before adult emergence, pupae were marked with different colors of a nontoxic fluorescent powder depending on the treatment. The emerged adults were kept for five days at 25°C. Then, they were subjected to three thermal acclimation regimes (15, 25 and 30°C) or they were kept at outdoor conditions for 5 days. At the age of ten days, ten individuals of each sex and treatment (acclimation regime) were released, at a short distance (5 m) from a trapping station consisted of a pair of Jackson trap baited with trimedlure and a plastic McPhail trap baited with BioLure that had been established on host or non-host trees. A total of four releases were conducted, two in early spring, at relative low temperatures and two during the summer months, at high temperatures. All trapping stations were inspected at regular intervals (1, 2, 5, 10, 15 and 20 days after release). Captured adults were taken to the laboratory and examined under a stereoscope using ultraviolet light to determine the marking color.

The proportion of recaptured adults ranged from 7.75 to 25.17 %. Overall, males were five times more likely to be recaptured than females. The higher the prevailing temperature during the release-recapture period the higher the capture rates. More flies were recaptured in trapping stations installed on host trees compared to those placed on no host trees. Acclimation at different temperature regimes was a significant predictor of recaptures with adults acclimated at 15°C or kept in outdoor conditions, responding better to traps regardless of the season. The importance of these findings to address challenges regarding the detection of low *C. capitata* populations is discussed.

Key words: acclimation, *Ceratitis capitata*, recapture, release, temperature, fruit flies, trapping.

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