

**Activity of essential oils and *Metarhizium anisopliae* against the Asian citrus psyllid
(*Diaphorina citri*)**

**N.M. Rosas-García¹, M. Mireles-Martínez, J.M. Villegas-Mendoza, A.D. Paz-
González, G. Rivera-Sánchez**

*Laboratorio de Biotecnología Ambiental, Centro de Biotecnología Genómica-Instituto
Politécnico Nacional. Blvd. Del Maestro S/N Esq. Elías Piña, Col. Narciso Mendoza.
C.P.88710. Cd. Reynosa, Tamaulipas, México. ¹nrosas@ipn.mx*

Abstract

Diaphorina citri (Hemiptera: Psyllidae), is a quarantine pest present mainly in family Rutaceae host plants from citrus-growing areas of the world. The psyllid is the vector of a bacterium that causes greening disease or Huanglongbing, characterized by greening of fruits and formation of yellow buds. Control measurements implemented are based on integrated pest management that includes application of chemical and organic insecticides as well as the use of natural enemies. The objective of this study was to evaluate the toxic activity of essential oils and the pathogenic activity of *M. anisopliae* strains against *D. citri*. We evaluated the insecticidal activity of six essential oils (cypress, eucalyptus, peppermint, lemon, orange, and garlic), and the pathogenic activity of five *M. anisopliae* (Ma56, Ma57, Ma60, Ma62, Ma67) strains against *D. citri* in laboratory bioassays. Bioassays were conducted in orange branches placed in plastic cups. For essential oils, 30 *D. citri* adults were sprayed with a suspension of 0.05% Tween 80 + essential oil adjusted to a concentration of 1ml/l with three repetitions. Sprayed insects were then placed on the branch. The cups were covered with tulle fabric and incubated under controlled conditions. For fungal strains, 50 insects were sprayed with a suspension of 3×10^8 conidia/ml, with five repetitions. Results indicated significant difference among essential oils. Cypress oil caused the highest toxicity (55.99%). Lemon and orange oils caused the lowest toxicity (~33%). Insecticidal activity also showed a significant difference among strains. Ma57 caused the highest mortality (77.20%), and the lowest mortality was caused by Ma56 (46%). Essential oils and fungal strains can be considered as good alternatives to control *D. citri*.