

A preliminary study of potential use of olive mill wastes as biocide against pupae of *Bactrocera oleae*

A. Kalaitzaki¹, G. Koubouris¹, G. Psarras¹, E. Markakis¹, E. Malandraki²

¹ELGO DEMETER, NAGREF, Institute for Olive Tree, Subtropical Crops and Viticulture, Agrokipio, 73100 Chania, Greece.

²Directorate of Rural Economy and Veterinary, Agyia, 73100 Chania, Greece

The common olive oil extraction process is a three-phase procedure, resulting in the production of olive oil, solid pomace (SP) and olive mill wastewater (OMW). During the last decade, two-phase decanters were introduced into the olive oil industry to reduce the volume of OMW, generating instead, a viscous sludge-like byproduct which contains wastewater and olive pomace (TPOMW), known as “alpeorujo”. Although the phytotoxic and antimicrobial properties of olive mill wastes have been extensively investigated, their potential utilization as biocides has been barely investigated. However, the biocide capacity of olive mill wastes, which could be utilized to suppress plant pathogens and pests, would open new opportunities for the recycling of these bioactive byproducts. The aim of this work was to study the effect of olive mill wastes on pupal mortality of olive fruit fly, *Bactrocera oleae* (Gmelin) (Diptera, Tephritidae), the most serious pest of olives in Mediterranean basin. Samples of olive mill wastes were collected from three olive mills located in Crete and Peloponnesus in Greece. More specifically, two samples of OMW and three samples of SP as well as three samples of TPOMW were collected from three-phase and two-phase decanters respectively. Ten pupae of *B. oleae*, 2-5 days old, and OMW or SP or TPOMW were placed in a plastic petri dish (9cm in diameter and 1 cm high) separately or in mixture with soil. Sample containing only 10 pupae of *B. oleae* separately or in mixture with soil was used as a control. Each treatment was replicated six times. The petri dishes were kept in laboratory conditions at 20°C. Mortality was determined by counting the number of dead pupae and emerged adults of *B. oleae*, 23 days after pupae were placed in the petri dishes. Among treatments significant higher pupal mortality was recorded at OMW and TPOMW samples compared to the other treatments. With regard to olive mill wastes in mixture with soil significant mortality was recorded at OMW treatments. Dry solid pomace did not cause significant mortality. Results from the study demonstrated the potential use of OMW and TPOMW as biocides against pupae of *B. oleae* in the soil. Further investigation for use in integrated production systems is in progress through the application of OMW in commercial olive orchards in the framework of the project LIFE OLIVECLIMA.

Keywords: olive mill wastes, biocide, *Bactrocera oleae*

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