

EFFECTS OF NO TILLAGE ON THE ABUNDANCE AND DIVERSITY OF SOIL AND OLIVE TREE CANOPY ARTHROPODS

C. Lousão¹, A. Bento¹, M. Campos², F. Ruano³, J.A. Pereira¹

¹ CIMO/Escola Superior Agrária, Instituto Politécnico de Bragança, Campus Sta Apolónia, Apt. 1172, 5301-855 Bragança, Portugal. jpereira@ipb.pt

² Departments of Environmental Protection. Estación Experimental del Zaidín (CSIC). Profesor Albareda 1. 18008. Granada. Spain.

³ Department of Animal Biology. University of Granada. Campus de Fuentenueva s/n 18071 - Granada, Spain.

Soil tillage is a traditional practice in the olive groves of Trás-os-Montes region (Northeast of Portugal) where the soil is maintained without any vegetal cover. However, this agronomic practice may have dangerous environmental effects of several orders. In this way, with the present work we aimed to contribute for the knowledge about the effect of two soil management practices in the olive grove (traditional tillage in comparison to no tillage) on the arthropods abundance and diversity of the olive grove soil and the olive tree canopy with special reference to Formicidae family. The work was developed between April and October of 2004, in two continuous plots submitted to the following agronomical practices: one plot submitted to frequent tillage to control weeds, and the other plot was no tilled. Monthly, the soil fauna was evaluated by 30 pitfall traps and olive canopy fauna was monitored by the beating technique of 25 trees per plot. The recovered material was sorted and identified. The results showed the existence of a diverse and rich fauna associated to the soil of olive grove and olive tree canopy. The olive soil arthropods are constituted mainly by Formicidae and Collembola. Sixteen ant species were identified in the soil being *Tapinoma nigerrimum* the most abundant. The no tilled plot had significantly higher specific richness and diversity of Formicidae. Also, the number of total arthropods, Aranea, Acari and Collembola was higher in the no tilled plot. On the olive tree canopy the Acari, Formicidae and Psocoptera were the most abundant groups. Concerning Formicidae family, 13 species were identified being *T. nigerrimum* the highest in number. The no tilled plot showed significantly high number of total arthropods (without Acari order), Formicidae and Coleoptera in comparison to the tilled one.

Key-words: olive grove, tillage, arthropods, abundance, diversity, Formicidae.