

Seed harvester and scavenger ants along roadsides in Northern Israel

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Abstract. Roads and their edges are important factors of human disturbance in natural landscapes. It is generally admitted that roadsides support more scavengers and seed harvester insects than habitats around them. I used ground-nesting ants (Hymenoptera: Formicidae) to test these hypotheses in a Mediterranean region of Israel. Twice in three different habitats (roadsides and range areas of shrub steppe (bata) and open maquis) I looked for ant nests in 90 plots, each of which measured 80 square metres. The dominant species was the seed-harvester *Messor semirufus* (André, 1883) that built more nests along roads than in the natural habitats. The distances between neighbouring nests were shorter in road verges than in nature. Subdominant species were scavengers *Tapinoma israele* Forel, 1904 and *Tapinoma erraticum* (Latreille, 1798) that nested equally in the studied habitats. In total, I found 131 nests of 23 ant species (10 % of species living in Israel). Species richness and Alfa biodiversity index were equal in the three habitats, while species composition was different, and nest number was higher in the roadsides. Beta turnover index of Wilson and Shmida indicated a net contribution of roadsides to general ant biodiversity. In conclusion the results of this research support the hypothesis that seed-harvester ants are more abundant in roadsides than in habitats around them, but they do not support the second hypothesis that scavenger species show the same pattern.

Key words. Biodiversity, Formicidae, Hymenoptera, Mediterranean Bata and Maquis, *Messor*, *Tapinoma*.

Introduction

Road systems and the vegetation strips along them are important factors of human disturbance of the natural landscape (FORMAN & ALEXANDER 1998). Much attention was given to traffic pollution and to rain run-off along roads, which may have a great impact in arid or semi-arid regions, augmenting the available water resources for vegetation in adjacent strips. This ecological situation creates vegetation communities dominated by disturbance-tolerant and exotic species (FORMAN & ALEXANDER 1998, TROMBULLAK & FRISSELL 2000). The effect of roads and road edge vegetation on animals is varied. They directly affect wildlife, for example by isolating habitats and populations and by serving as deadly barriers (MADER 1984, RICHARDSON et al. 1997, Inbar & MAYER 1999) and indirectly by supporting high densities of invasive insects (MORRISON & PORTER 2005). In addition, scavenger ants may benefit from road kills (SAMWAYS et al. 1997, TSHIGUVO et al. 1999) as do herbivore insects feeding on vigorous plants (RIES et al. 2001, MARTINEZ & WOOL 2006) or seed predator insects that are not in competition with husbandry grazers in this habitat. This may be the case in the northern Galilee highlands in Israel, where agriculture-free areas are used as cattle or goat pasture in managing bush fire risks in the Mediterranean maquis and bata. The herds are prevented from grazing on the road-strip vegetation by barbed-wire fences. To