



Behavioural responses of Eurasian treecreepers, *Certhia familiaris*, to competition with ants

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Abstract. Competition for a specific resource that is essential for the survival of both the competitors may be intense even between very dissimilar taxa. However, the importance of the effects caused by such interspecific competition has seldom been emphasized. These effects can appear as differences in individual foraging behaviour during the breeding season, which can result in critical variation in fitness. In this study we examined the effects of wood ants (*Formica rufa* group) on the abundance of other invertebrates on tree trunks and on the foraging site selection of breeding Eurasian treecreepers, which use the same habitat as wood ants. Arthropods were scarcer on the trunks with ants present; the treecreepers avoided these trunks and foraged for a shorter time on trunks with ants than on trunks without ants. We also tested experimentally the existence of competition between ants and treecreepers by comparing the foraging behaviour of breeding treecreepers on spruce trunks with ants, without ants and with experimentally reduced numbers of ants. On average arthropods were scarcest on trunks with ants present. Male treecreepers also foraged for a shorter time on spruce trunks with ants. The reduction in ant numbers allowed food resources on trunks to recover over a week and led to longer foraging times of the treecreepers on these trunks than on trunks with ants present. The longest treecreeper visits were on trunks without ants. Our results suggest that competition between two very different taxa may be effective in determining the behaviour of foraging individuals. © 1997 The Association for the Study of Animal Behaviour

Many field experiments have demonstrated competition between animals of different species (Connell 1983; Schoener 1983). Interspecific competition is often believed to be most intense between closely related species with similar niches. This idea assumes that distantly related taxa are too different from each other to compete intensively. However, it has also been proposed that competition is most intense between dissimilar taxa (Keddy 1989). According to this view, competition for the same resource more often leads to an asymmetry in the outcome of competition between very different species than between similar species. Therefore dissimilarity is more likely

to cause total or partial exclusion of species (Keddy 1989). Field experiments have found evidence for both of these suggestions (Connell 1983; Schoener 1983; Wiens 1989; Haemig 1992). The amount of food on foraging patches also affects the foraging behaviour of individuals. According to optimal foraging theory, a forager should adjust its patch-residence time according to the patch quality. In an environment with patches of varying quality an individual should stay for a shorter time on a poor patch than on a richer one (Stephens & Krebs 1986). Although it has been well recognized that competition is effective in structuring ecological communities (Wiens 1989), the effects of interspecific competition on the foraging behaviour of individuals in dissimilar taxa during the reproductive season have seldom been emphasized.

The Eurasian treecreeper is a hole-nesting, double brooded and insectivorous passerine bird that breeds throughout the northern coniferous

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