

Abstract*

**Small-scale foraging by *Camponotus vagus*
and *Formica fusca* (preliminary results)**Orsolya KANIZSAI¹, Balázs KAHOLEK² & László GALLÉ³

The role of competition in structuring ant assemblages has been extensively studied (e.g. SAVOLAINEN and VEPSÄILÄINEN 1988, SANDERS and GORDON 2003, CZECHOWSKI and MARKÓ 2005, ANDERSEN 2008, LESSARD *et al.* 2009). The main assembly rules are due to competition in ant communities. In spite of this, there are many examples that several ant species of similar requirements are able to coexist in the same habitat. The main question is that, which factors make possible the coexistence of similar species within local communities (ANDERSEN 2008).

Colonies of *Camponotus vagus* (SCOPOLI, 1763) and *Formica fusca* (LINNAEUS, 1758) co-occur in the same forest habitats, occupying similar nesting sites and utilizing similar food sources in the forest-step regions of Hungary. In some cases, the two species' nests are situated close to each other, the smallest measured distance is shorter than 1 m, or in some cases we found *F. fusca* nest under the same trunk ruled by *C. vagus*. The main addressed question of this study was, whether the two species have different strategies in space utilization which makes possible the submissive *Formica fusca* to coexist with the more aggressive and larger *Camponotus vagus*.

We studied the colonies of the two species both in laboratory and in natural conditions. We performed laboratory experiments about food type dependency, small-scale distance dependency and we tested the competition between the two species' colonies. We reared the experimental colonies in plastic nest boxes (38 litre) at a temperature of 22 ± 3 °C with 12/12 photoperiod. Each nest was connected to the foraging arena of 180x65 cm, divided into 468 grid squares of 5x5 cm size. Baits of artificial food were put randomly in 12 squares before the start of the experiments.

The field observations were carried out in two forests in southern Hungary, one with and one without *C. vagus*. Ant nests were mapped in two randomly selected 10x10 m plots in both forest sites. We measured the distance between nests and we tested the aggression between the two species' workers from neighbouring and distant nests.

In the course of laboratory experiments, as expected, exclusions were observed by the superior competitor *Camponotus vagus* from the food sources in the common foraging arena. The visiting rate of food item by the *C. vagus* was independent of the distance of baits from the nest entrance, whereas the quality of food had a significant effect: it preferred composed food, consisted of both protein and sugar. In contrary, *Formica fusca* workers visited more frequently the baits which were closer to their nest, therefore even this small scale distance had significant impact on their foraging, but the quality of food had no impact on their behaviour. There was a „border line” at 90 cm beyond which the rate of arrivals on baits by *F. fusca* foragers decreased sharply and the discovering efficiency was also lower farther than 90 cm.

In the first *Camponotus*-free forest site, the nest density of *F. fusca* was two times as high as in the second one, with *C. vagus* nests. There was no significant difference in the distance between the nearest *F. fusca* nests in the two forests. Interestingly, the average distance between the nearest nests of *C. vagus* and *F. fusca* was significantly smaller than between conspecific *F. fusca* nests.

In the aggressivity tests we found aggressive interaction between the workers from the nearest *F. fusca* and *C. vagus* nests in spite of their closeness and there was no aggression between the workers from the distant nests of the two species. In the light of this aggressiveness between the close-living *C. vagus* and *F. fusca* we should consider the hypothesis about the presumed relations between the two species - we should behoove further studies to discover the causal background of this differential aggressiveness.

These results indicate that the differences in the small scale distance dependency may have an effect on the cohabitation in natural conditions, too.

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