



How does the number of nest entrances influence recruitment and collective foraging in ants?

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Efficient foraging strategies of ants are core components of their ecological success. In this respect, the nest entrances are key-locations where workers share information about newly discovered resources. Despite the expected role of entrances in the regulation of food recruitment, there is currently little quantitative research on how the number of entrance openings may impact the foraging efficiency of an ant colony. We compared the collective foraging responses displayed by *Myrmica rubra* ant colonies that were settled in artificial nests with one or two entrances. Concerning the recruitment dynamics toward a single 1M-sucrose source, the total outgoing flows of workers were similar whatever the number of nest entrances. However, in the two-nest-entrances configuration, as the ants' flow was split between both entrances, this delayed the recruitment dynamics and reduced the overall sucrose consumption. In addition to a decreased foraging efficiency toward a single source, two nest entrances also altered the colony's ability to make the best choice when faced with two food sources of different quality (1M vs 0.1M sucrose). Indeed, while the outgoing flow of workers doubled in two-entrance-nests, we noticed a weaker discrimination between the two food sources as well as a lower total sucrose consumption. An individual tracking of the foragers explained this lower foraging efficiency: a higher number of workers lost track of the trail between the nest and the food, resulting in a weaker success rate at reaching a resource. Thus, our study highlights that the structure of the physical interface between the nest and its environment is a key factor in the emergence of collective strategies in insect societies. By spatially dividing the flows of recruiters and recruits, the multiplicity of nest entrances alters the self-amplification processes that underlie collective decision making and discrimination between resources.