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Foraging strategies may mediate the coexistence of ant species attending *Kerria yunnanensis* on their host plant

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Abstract

The role of different foraging strategies in the coexistence of ant species is poorly understood. In this study, we examined the effects of accessibility of food resource (more / less accessible environment) and food type (carbohydrates and protein) on discovery dominance trade off, and which foraging traits are related this trade off in a guild of ants attending lac insect (*Kerria yunnanensis* Ou et Hong) on their host plant (*Dalbergia obtusifolia* Prain) in the Yunnan province, China. We found that: 1) the ant assemblage on *D. obtusifolia* comprised 11 ant species; ant species differed significantly in relative abundance; 2) there was a discovery dominance trade-off among ant assemblage. Ant species with fewer individuals discovered more food relative to abundant ant species; *Crematogaster macaoensis* Wheeler dominated most of the baits. Once the food resources were discovered by *C. macaoensis*, they monopolized them; any other closing ant species were attacked. Though some ant species were quick in finding new food resources, they were unable to monopolize them; 3) the type of accessibility to food resources affected the success of discovering food resource. Some ants discovered more food in more accessible environments, relative to less accessible environments, some ants discovered more food in less accessible environments relative to more accessible environments. *C. macaoensis* dominated more in less accessible environments than that in more accessible environments; 4) protein attracted more than twice as many species compared to carbohydrates in two environments of different accessibilities; 5) the ant community on lac insect host plant exhibits foraging strategies such as foraging at low-medium rates for short distances and foraging at high rates for long distances. Foraging at low-medium rates for short distances was advantageous in a less accessible environment but disadvantageous in a more accessible environment, and vice versa; 6) We recommend that an approach which combines foraging features of ants under different accessibility to food resource with their relative foraging success may provide a good understanding of ant community structure.

Key words: Ant community, discovery-dominance trade off, foraging behaviour, lac insect, *Dalbergia obtusifolia*.

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