



Individual learning and colony interactions shape the foraging ecology of a solitarily foraging ponerine ant

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In solitarily foraging social insect species, foraging workers lack social information and must rely only on private information to make adequate behavioural decisions. Nonetheless, it is expected that foraging choices enhance both individual success and colony fitness. Competition within and between colonies of these species is thus expected to be mostly of an exploitative nature, resulting in both overdispersed individual foraging areas and colony distribution. However, colony distribution of several species suggests that competition may not be the main factor involved in ant coexistence. Using *Neoponera verenae*, we explore how individual foraging parameters relates to both intra and intercolony relationships. This solitary foraging species is found in high and aggregated assemblies and is characterised by highly frequent colony movements, which allows to investigate the dynamics of foraging decisions after colony emigration, which requires the acquisition of new foraging routes, and faced with different social (proximity of competitors) and environmental (microhabitat) factors. We carried out a long term study at the Rosal reserve in the state of Espírito Santo following 15 colonies in a 150 square-meter area during a two-months period and monitored both individual and colony-level foraging areas, success and route fidelity across several emigrations. We show that individual routes are both influenced by environmental and individual behavioural factors, as well as colony size and that whole colony rather than individual success may trigger emigration and shifts in foraging areas. In conclusion, the foraging ecology of *Neoponera verenae* shows highly dynamic patterns both at the individual and colony levels where the learning flexibility of workers devoid of social information may allow for the maintenance of colony fitness.