

OR028

Nutrition and colony investment in Solenopsis invicta workers

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In social insects, investment into worker size versus worker number is thought to play an important role in determining colony success. Additionally, colony investment into the worker force may shift in response to the availability of resources. Access to carbohydrate-rich resources can influence colony growth, and the monopolization of such resources has been implicated in the ecological success of certain groups of ants. Here we conduct a diet-manipulation experiment to test how access to carbohydrates and amino acids affects colony investment in worker number, mean worker body size, worker size distributions, and individual worker fat content (condition) of a polymorphic ant species (*Solenopsis invicta*). Field collected colonies (n = 15) were divided into four experimental sub-colonies, each consisting of two queens, ~ 1200 workers, and ~ 50 brood. Each experimental subcolony was reared on a diet of insects and one of four macronutrient treatment solutions: water, amino acids, carbohydrates, and amino acid + carbohydrates). Having access to carbohydrates increased the colony biomass after 60 days. This increase in biomass resulted from shifts in worker number and worker size, but not an increase in worker fat content. Increased access to carbohydrates altered the worker body size distributions of colonies such that colonies increased production of larger 'minor' workers but not larger 'major' workers. These changes in colony investment shed insight into how macronutrient limitation shapes colony demography and in turn may contribute to ecological success.