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Does increased contact rate increase foraging efficiency in leaf-cutting ant?

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Trail traffic in ants always involves a high rate of head-on encounters between workers. These encounters decrease the speed of nestbound laden ants and thus lead to an overall decrease of the rate of resources arrival to the nest. Previous experiments have shown however that in leaf cutting ants placed in crowding conditions this decrease can be compensated by an increase in foraging efficiency (proportion of laden ants in the nestbound flow). The aim of our study was to test the hypothesis that this could be due to the fact that, following multiple contacts with nestbound laden ants on their way to the foraging area, outbound ants could be stimulated to carry leaf fragments when returning to the nest. We worked on the leaf cutting ant *Atta laevigata* and manipulated the rate of contact between workers travelling on a bridge placed between their nest and a foraging area. To increase the rate of contacts between outbound ants and leaf fragments, we hanged leaf fragments to an endless thread suspended a few millimeters over the bridge. During the experiments the leaf fragments were then moved nestward at the average speed of a laden ant. Conversely, to decrease the rate of contacts between outbound and inbound ants, we removed at the foraging area end of the bridge one out of two laden (or unladen) ants in the flow of returning workers. The foraging efficiency measured in these experimental conditions was then compared to that observed in control condition, i.e. without any contact manipulation. Overall, our results fail to show any statistically significant effects of contact rate manipulation on foraging efficiency, suggesting that the increase in foraging efficiency observed in crowding conditions may be linked to other phenomena, e.g. a higher density of trail pheromone deposits or a particular traffic organization.