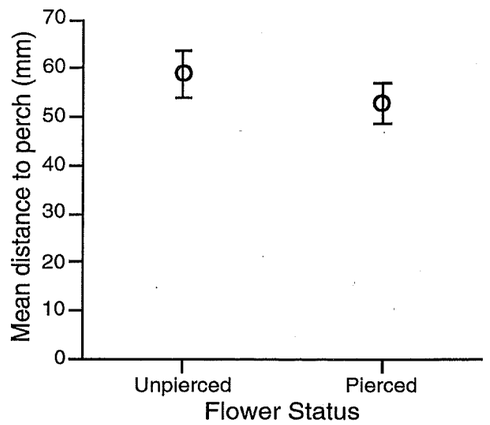

Fig. 4. Mean distance(± 1 SE) to the nearest potential perch on Species A was significantly shorter for pierced flowers than non-pierced (n = 17).

egories stands in clear contrast to our perch analysis and may be attributable more to our system of microhabitat classification than to the biology of *D. plumbea*. The species of a flower explained much of the variance in piercing factors across flowers. Species A grows in more dense vegetation (personal observation), providing *D. plumbea* with greater perch availability, while Species B is found in more exposed microhabitats and its flowers are usually on influroscences extending above the surrounding vegetation and as a result, it is less pierced. Our findings illustrate both a direct effect of perch availability and proximity on piercing and a possible indirect effect of these parameters on flower species preference.

Literature Cited

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Leaf-load and communication in nest-bound leaf-cutter ants

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Abstract: Not all leaf-cutter ants return to their nest with leaves. We observed that many nest-bound ants seemed to bump, face-to-face, with ants moving in the opposite direction. We thought this might be some form of communication regarding food-sources or colony needs. We predicted that nest-bound ants without leaves would bump with a greater frequency than their leaf-carrying counterparts in order to communicate information. We found that significantly more ants moved towards the nest with a leaf than without a leaf, but no difference in the frequency of bumps between nest-bound ants carrying leaves and those not carrying leaves. If bumps are an indicator of communication, all nest-bound ants may communicate equally, regardless of leaf load, to maintain direction and communication on the trail.

Key Words: Atta colombica, *communication, Corcovado*

Introduction

Leaf-cutter ants (*Atta colombica*) are eusocial insects that construct trails from their nest mound along the forest floor to desired feeding locations. Harvested fragments of these leaves are then carried back to the nest and used to grow a fungus food source. We observed that not all individuals moving in the direction of the nest along the trail carried leaves. We hypothesized that nest-bound ants without leaves might serve an alternate purpose besides foraging. We observed that many of these ants seem to "bump" face-to-face with ants moving away from the nest, which we thought might be some form of communication via chemical signaling. Such nest-bound ants without leaves may specialize in communicating about food sources, or possible intruders/obstacles on trails. We thus predicted that nest-bound ants without leaves would "bump" with a greater frequency than their leaf-carrying counterparts. We also quantified the proportion of nest-bound ants with and without leaves to determine ant activity.

Methods

On 1 February 2001 we located three leaf cutter ant trails on Sendero Sirena, near Estacíon Biologica Sirena, in Corcovado National Park, Costa Rica. We haphazardly chose three points on each trail for monitoring ant behavior. The location of points had no relationship to the distance from the mound, but were approximately equally spaced from one another.

We designated a 1 m trail segment at each of the above mentioned points. We followed individuals moving towards the mound and counted the total number of bumps with other ants along the segment. Counts were done on six different ants, three with and three without leaves, in each segment. We counted the number of ants moving towards the mound with and without leaves, for 1 min at each reference point. Two replicates were performed at each point.

Results

There was no difference in the frequency of bumps between ants carrying and those not carrying leaves (paired-t = 1.10, df = 26, P = 0.86; Fig. 1). We found significantly more ants moving towards the nest with a leaf than without a leaf (paired-t = 4.74, df = 17, P = 0.0001; Fig. 2). Sixty-eight percent of the nest-bound ants carried a leaf fragment (Fig. 2). The 32% of ants moving towards the nest

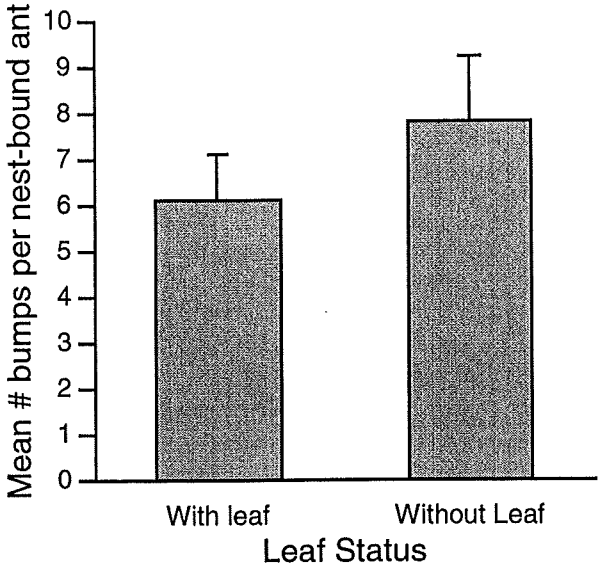

Fig. 1. Number of bumps between nest-bound ants with or without leaves and outbound ants. The number of bumps was averaged across 27 individuals of each leaf-status from three trails (means ± 1 SE, n = 27).

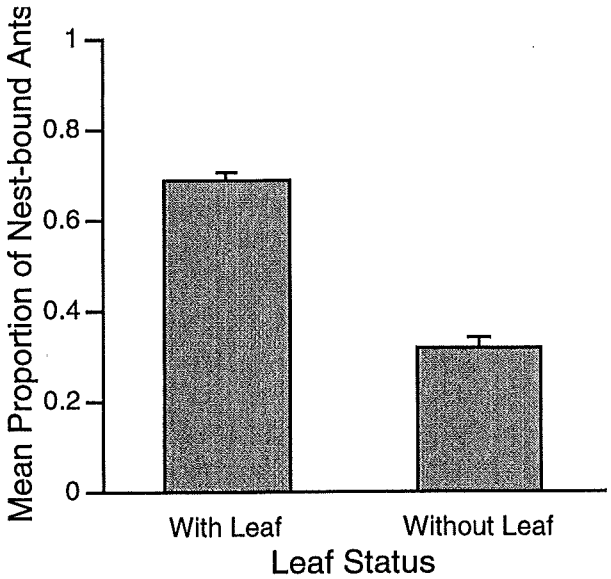

Fig. 2. Proportion of nest-bound ants with leaves and without leaves. Ant movement was counted twice at three reference points per ant trail. Counts were averaged across three trails (means ± 1 SE, n = 18).

without leaves were a mixture of soldiers and workers (personal observation).

Discussion

The high proportion of nest-bound ants carrying leaves (Fig. 2) suggests that ants were at the daily height of their foraging (Wirth et al. 1997). Perhaps the observed 32% of nest-bound ants without leaves do not go directly between the nest and food source but instead alternate direction on the trail. The lack of significant difference in the frequency of bumping between nest-bound ants carrying leaf fragments and those without leaves (Fig. 1) suggests that all nest-bound ants bump equally regardless of leaf load, and thus participate equally in communication, assuming this behavior is involved in some communication. On the other hand, bumps may be random contacts between ants and are not indicative of communication. Further research should consider the relationship between bumps and ant foraging rates, abundances on trails, and agonistic encounters to determine whether the contact is indeed communicative.

Literature Cited

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