

Ants at bromeliad inflorescences – hunting mites or collecting nectar?



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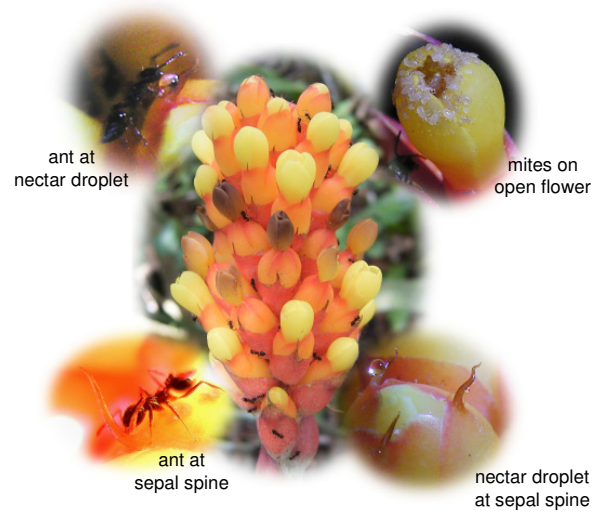
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Introduction

Ants are frequently seen in great numbers and diversity on inflorescences of the bromeliad species *Aechmea lindenii* (see photo on the right) occurring in southern Brazil. This raised the question as to what attracts the ants to the inflorescences. Preliminary observations of ant behaviour and the conspicuous occurrence of mites in the flowers (see photo on the right) suggested two possible hypotheses:

- 1) Ants exploit some attractive substance on the sepals.
- 2) Ants prey on mites occurring in the flowers.



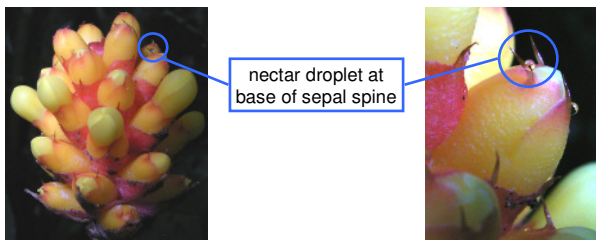
Material & Methods

- Examined bromeliad species: *Aechmea lindenii*.
- Study site: secondary forest in Florianópolis, Santa Catarina, southern Brazil.
- Examination for extrafloral nectar production: excluding of flower visitors from 3 inflorescences by enclosing them with plastic bags.
- Determination of frequency of mite/ant occurrence on inflorescences: examination of 200 inflorescences, all of them searched for ants, and 158 additionally for mites.
- Analysis of time allocation among different behaviours: real time behavioural recordings of the ant species *Brachymyrmex coactus* on 4 inflorescences (5-6 workers/inf., 1 h 35 min total observation time).

Results

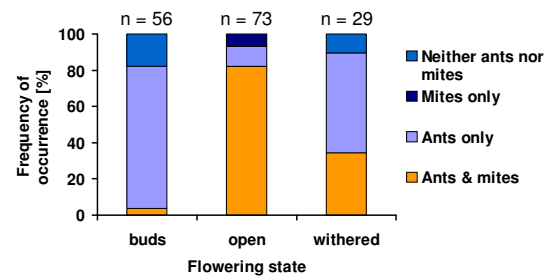
1. Production of extrafloral nectar

- Bagged inflorescences: clear viscous droplets (see photos below) were accumulating at the bases of sepal spines within about 2 hours.
- Sugar content: 18-40 %.
- Droplets formed not only on open (= floral nectar-producing) flowers but also on buds and withered flowers.



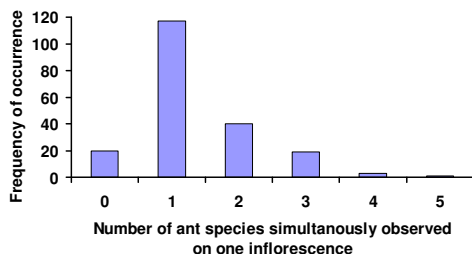
3. Co-occurrence of ants and mites

- Inflorescences with buds only: co-occurrence on 4 % of all inflorescences.
- Inflorescences with open flowers: co-occurrence of 82 %.
- Inflorescences with all flowers withered: co-occurrence of 34 %.



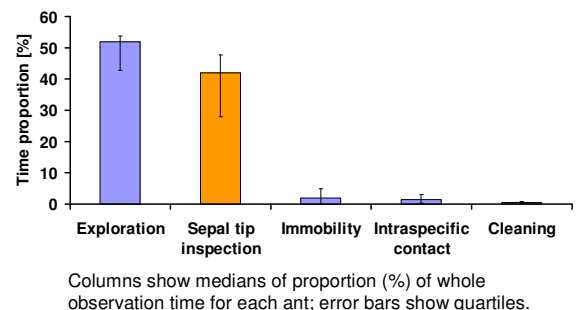
2. Ant occurrence and diversity

- Ants were found on 90 % of all inflorescences (n = 200).
- Most frequently one ant species was present.
- Co-occurrence of >1 species was also frequently observed.
- 17 genera were identified; most frequently observed: *Crematogaster*, *Solenopsis*, *Camponotus*, *Brachymyrmex*.



4. Behavioural observations (*B. coactus*)

- Ants spent notably more time with inspection of sepal tips than with other behaviours except of exploration.
- Observations of other ant species mostly yielded similar results.



Conclusions

- For the first time the production of a nutrient-rich extrafloral nectar was demonstrated in *Aechmea lindenii*.
- Ants were found in high frequency and diversity on inflorescences of all flowering states.
- Behavioural observations in line with the phenology of ant visits suggested that **ants were mainly attracted by the extrafloral nectar produced at the sepal tips.**

Although ants have been occasionally observed to prey on mites these are apparently not the main attractant for the ants but might be an additional food source used by them opportunistically. It needs to be further studied whether the presence of ants on the flowers has a beneficial effect on the bromeliads, presumably by reducing herbivory on reproductive tissues.

Acknowledgements

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