

ON HUMMINGBIRDS, ANTS AND FLOWERS*

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SUMMARY

It has been found that flowers of *Abutilon striatum* Dickson (Malvaceae) are robbed by hummingbirds and *Trigona* bees and, thus opened up, invaded by ants of the genus *Pheidole*.

JANZEN (1977) pointed out that in tropical habitats although ants collect at most sugar sources, they do not collect flower nectar, hypothesizing that it may contain repugnant, indigestible or toxic chemicals.

BAKER & BAKER (1978) stated that nectar drinking ants are not uncommon in tropical flowers, although they may often collect extra floral rather than floral nectaries and that more data are badly needed.

* Entregue para publicação em 12.11.1979.

Com auxílio do Conselho Nacional do Desenvolvimento Científico e Tecnológico, CNPq.

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FEINSINGER & SWARM (1978) propose that "plants can undertake at least three evolutionary pathways in response to potential thievery by ants ... secretion of repellent compounds ... physical modifications of the flower to exclude walking ants ... or ... ignoring or even exploiting nectar thieving ants".

SCHUBART & ANDERSON (1978) tested Janzen's hypothesis and observed "that the apparent exclusion of ants from flowers is not caused by allelochemical substances in floral nectar ... and it is probable that ants feed more frequently on floral nectar than Janzen suggests".

BOLTEN & FEINSINGER (1978) "urge authors to report on sugar concentrations ... in nectars they measure".

In Piracicaba, State of São Paulo, Brazil, we observed, during the months of July and August, nectar feeding animals on *Abutilon striatum* Dickson (Malvaceae). The flowers of this plant have fused sepals, 15-20 mm long and present, at the inner basis of the calyx, one lobed nectary made up of multiseriate, glandular, erect hairs, revesting the deepness of the tubular calyx. The petals are 45-50 mm long, are overlapping, forming a somewhat conic corolla.

The flowers are regularly visited by:

1. Hummingbirds, which come early in the morning and late in the afternoon; they insert their beak laterally, in between the petals, forcing its way toward the nectar.
2. Stingless bees, meliponids, *Trigona spinipes* Fabricius, which cut circular holes of 3-5 mm in diameter, through the calix, thus reaching the nectar.
3. Ants, *Pheidole* (*Pheidole*) sp. can be seen regularly walking on the outside of the calyx of integral flowers; they sometimes venture on to the petals

but have never been observed entering through the wide opening of the corolla. However, once the calyx has been cut through by a stingless bee, numerous ants (up to 49 per flower) pass through these holes and collect the abundant nectar.

The nectar was analyzed for Brix by an AO Goldberg Temperature Compensated Refractometer; measurements were taken at 8⁰⁰ h and at 17⁰⁰ h, of nectar from integral flowers and from those whose calyx had already been perforated by stingless bees, and are given in Table 1.

Table 1 - Brix of nectar from *Abutilon striatum* flowers. (5 measurements; all flowers from same plant)

Time	Flowers	Brix	Average
8 ⁰⁰ h	Not perforated	26.5-27.0-28.2-22.0-29.0	26.5
	Calyx perforated	26.0-29.5-29.0-29.0-27.0	28.1
17 ⁰⁰ h	Not perforated	18.4-10.5-24.0-23.0-23.8	19.9
	Calyx perforated	23.0-22.0-28.0-15.3-19.0	21.5

ACKNOWLEDGEMENTS: We are grateful to C.R.Gonçalves and J. M.F.Camargo who kindly identified the ant and stingless bee.

RESUMO

SOBRE BEIJA-FLORES, FORMIGAS E FLORES

Relata-se a relação entre beija-flores, formigas e flores de uma malvacea, *Abutilon striatum*, tendo-se achado que beija-flores e meliponídeos colhem o seu néctar e, uma vez tendo o seu cálice perfurado pelos últimos, são invadidas por formigas.

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