



## **INTERACTION BETWEEN ANTS AND SEEDS OF *Clitoria laurifolia* POIR. (FABACEAE: FABOIDEAE) IN A RESTINGA FOREST DEGRADED BY SAND MINING**

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### **INTRODUCTION**

The sandy coastal plains, the so-called *restingas*, are very fragile and susceptible to disruption. Established on sandy, highly leached, and nutrient-poor soils, its conservation depends, in large part, on intrinsic mechanisms existing in the plant community. According to Passos and Oliveira (2003) ants play an important role in fruit/seed biology in the *restinga* forests. The importance of ants as disperses and also as secondary dispersers of non-myrmecochorous species has been shown (Leal e Oliveira 1998, Pizo e Oliveira 2000, Costa *et al.* 2007). *Clitoria laurifolia* Poir. (Fabaceae: Faboideae) is a pionier, herbaceous species with wide distribution, occurring in *cerrados* and *restingas*. Their fruits are autochoric with greenish, elliptical, 2cm wide seeds, which have a sticky substance on their surface. In degraded areas, the individuals of *C. laurifolia* concentrate in sandy parts, which are sun-exposed and present intense foraging activity of ants.

### **OBJECTIVES**

The main objective of this study was to investigate the interaction between ants and seeds of *Clitoria laurifolia* in a *restinga* forest degraded by sand mining at São Vicente, SP (23°57'3''S e 46°23'5''W).

### **MATERIAL AND METHODS**

To determine which ants interact with *C. laurifolia* seeds, as well as how ants treat them, we made diurnal (0900–1600) observations of seeds placed directly on the floor, along a 50 m transect, established through the area where these plants were abundant. The seeds were placed in groups of ten ('baiting station') and at intervals of 5 m to allow discoveries by different ant colonies. We inspected the transect continuously, recording the number of seeds removed. Furthermore, we inspected the baiting stations at each hour for two minutes recording ants attracted to the seeds, as well as whether they ignored, examined, took the seeds away and/or recruited individuals to exploit them on the spot. We followed ants carrying seeds until they entered their nests or disappeared in the leaf litter. The distance of seed displacement was then measured. The experiments and observations were made at five non-consecutive days between May and June 2008.

### **RESULTS**

A total of four ant species were observed at the baiting stations, *Atta sexdens* (Linnaeus) (Myrmicinae), *Camponotus melanoticus* Emery (Formicinae), *Dorymyrmex brunneus* Forel (Dolichoderinae) and *Solenopsis* sp (Myrmicinae). *D. brunneus* was the most frequent species observed, but it only examined and ignored the seeds.

Therefore the most common behaviors throughout the observation period were to examine and ignore the seeds. The three remaining species removed or tried to remove the seeds and most of the observed removals were performed by *A. sexdens*. The first removals occurred from the outset with a peak between 10 and 11 hours. The mean number of seeds removed was 1.2 (sd = 1.7, n = 33) and the mean distance of removal was 8 cm (sd = 5.6, n = 22). No seeds were observed being carried into the ant nests. The recruitment behavior was observed only for *Solenopsis* sp.

## DISCUSSION

Leaf-cutting ants of the genus *Atta* became hyperabundant due to the recent increase in habitat fragmentation, as some species benefit from human introduced disturbances (Corrêa *et al.* 2010). These insects are among the most voracious and polyphagous affecting both forests and agricultural areas, thus also being described as pests. However, they can play an important role in the biology of different plant species as well as the structure of the environments (Leal e Oliveira 1998). The Attini interacts opportunistically with fruits and seeds of several species, using them as a substrate for the fungus they cultivate and contributing to seed dispersal of some plant species (Leal e Oliveira 1998, Corrêa *et al.* 2010). Although granivorous ants that disperse seeds to short distances are recognized more as predators, they can also disperse seeds as they accidentally abandon them (Christianini e Oliveira 2009, Engelbrecht e García-Fayos 2012). Our results indicate that the ants, especially *A. sexdens*, can accidentally disperse *C. laurifolia* displacing the seeds on peat. However the ants' interaction with the seeds was hindered by the sticky substance on their surface. Kreitschitz (2012) reported that mucilage secretion around the seed or fruit coat was a characteristic feature of plants growing mostly in dry habitats and those occupying waste, disturbed locations. Many ecological roles have been suggested for these sticky substances including seed hydration, regulation of germination, prevention of seed predation by adherence to soil, and promotion of seed dispersal by attachment to animals (Engelbrecht e García-Fayos 2012, Kreitschitz 2012, Sun *et al.* 2012). The context where the *C. laurifolia* seeds were studied include environmental disturbance, hot and dry substrate (sand) and intense activity of ants. At this conditions a substance that retain water around the seeds and help them to escape massive collection by ants can be essential for maintain population densities above local extinction thresholds (Engelbrecht e García-Fayos 2012, Sun *et al.* 2012).

## CONCLUSION

The sticky substance present on *C. laurifolia*' seeds surface can explain why the ants apparently avoid them, but further research is needed to clarify the role of this substance in seeds predation and dispersion.

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