

## SCIENTIFIC NOTE

*Azteca barbifex* Forel (Hymenoptera: Formicidae): Potential Pest of Citrus Crops in Eastern Amazon

PAULO R S FARIAS<sup>1</sup>, ANA Y HARADA<sup>2</sup>, ANDERSON G SILVA<sup>3</sup>, BRUNO S MONTEIRO<sup>1</sup>,  
NARA E L RODRIGUES<sup>1</sup>, NAIRA A SANTOS<sup>3</sup>

*Instituto de Ciências Agronômicas, UFRA, Av Tancredo Neves 2501, 66077-530 Belém, PA, Brasil; paulo.farias@ufra.edu.br; <sup>2</sup>Coordenação de Zoologia, Museu Paraense Emílio Goeldi, Av Tancredo Neves 1901, 66077-530 Belém, PA, Brasil; <sup>3</sup>Departamento de Entomologia, FCAV/UNESP, Prof Paulo Donatto Castellane s/n, 14870-000 Jaboticabal, SP, Brasil*

*Edited by Jorge B Torres - UFRPE*

*Neotropical Entomology 39(6):1056-1058 (2010)*

**ABSTRACT** - Damage caused by the ant *Azteca barbifex* (Forel) was identified in orange trees (*Citrus sinensis*), in Capitão Poço County, Guamá microregion, Pará State. The damage caused by the scraping of stems and branches lead to reduction in yield with subsequent death of the plant. These characteristics indicate *A. barbifex* as a potential pest of citrus crops in the eastern region of Amazon.

**KEY WORDS:** Ant, *Citrus sinensis*, monoculture

Citrus production in the state of Pará has grown rapidly in the last 10 years. The state is the first in citrus production in northern Brazil, is among the five leading orange-producing states in Brazil, with a further potential for expansion due to the increase of sugarcane cultivation in the state of São Paulo, among other factors (Nehmi Filho *et al* 2002). The state's leading region is the microregion of Guamá, including Capitão Poço, Garrafão do Norte, Irituia, and Ourém Counties, which generate 70% of the total production in Pará. Orange orchards cover an estimated area of 15,000 hectares, with 276 thousand tons of fruits (Oeiras 2002).

Insect pests are among the most important constraints to the production of citrus in the tropics. In Pará, the most common are the scale *Orthezia praelonga* Douglas (Hemiptera: Ortheziidae) and the citrus blackfly *Aleurocanthus woglumi* Ashby (Hemiptera: Aleyrodidae). But the ant *Azteca barbifex* Forel was recently found in citrus orchards of Guamá region, and it has been considered as a potential pest for citrus production in eastern Amazon.

*Azteca* ants live in Neotropical region; they are omnivorous, but they have a preference to sugary substances (Harada & Benson 1988). In Amazon, *Azteca* ants are associated with at least 10 species of plants. All of these ants have arboreal locomotion (Harada 1989), are adapted to several kinds of habitat, are not nomadic, and may or may not be associated with a host plant (Forel 1899, Cuzzo 2003). *Azteca barbifex* is a carton-nest builder, and builds its nests on the stems, main trunk, and crown of trees, with a preference for the trunk (Fig 1). Dejean *et al* (2008) observed predatory behavior and strong territorial aggressiveness in defending their host plant, mentioning that *Azteca* ants kill other insects to feed on and also to protect their territory.

Several species of the genus *Azteca* build carton nests,

which may be over 1m wide, polydemic or not, and contain thousands of individuals. These ants are normally associated with other invertebrates living in mutualism interaction inside their nests (scale insects, aphids, mantid lacewings) (Davidson *et al* 1991) or with nearby wasp nests (*Polistes* spp.) (Forel 1899). The species *A. barbifex* occurs in South America (Trinidad, and in Brazil, in the states of Amazon and Roraima) (Kempff 1972); it has only recently been recorded in Pará.

According to Benson (1985), large colonies of *Azteca* may protect citrus from herbivory by leaf-cutting ants (*Atta* spp.), with a simultaneous positive effect on scale insect pests. However, *A. barbifex* has also been observed damaging orange groves in recent years, leading to high yield losses. Yield losses were caused by the scrape of the bark on the most tender branches of orange trees (Fig 1 d, e) by *A. barbifex*, and this attack hindered production for the entire harvest period.

The nest develops in a short period of time during four to five months (Fig 1a, b, c), and the progressive damage eventually kills the plant (Fig 1f). The nest progresses as the pre-existing nests and eventually occupies the entire trunk of the tree. The ants can easily disperse linearly down the rows of trees through the canopy that generally overlap with the neighboring tree (Fig 1g).

The density of the nests of *A. barbifex* in a Citropar farm area in Capitão Poço County grew considerably between June and November 2007, culminating with nests occupying 10.8% of the plants in November. In January 2008, there was a small decrease, with 9.8% of infested plants. In the following months, there was a substantial decrease in the number of nests in the area; only 1.1% of the plants were infested in April, 2008. This tendency could be explained by





Fig 1 Development of nests of *Azteca barbifex* in citrus plants. a) Newly-founded nest; b) two months old, medium size nest with subnests on the stems; c) and large size nests-dominating the stems of the plant; d) injury caused to stem tips of citrus tree; e) scraping injury to branches; f) citrus tree killed by attack of *A. barbifex*; g) and progress of the nests along the row in the grove.



the rainfall cycle, with higher rainfall from January to May and lower from August to November. Therefore, conditions in the dry season may favor the development of *A. barbifex* and deserve further investigation.

### References

- Benson W W (1985) Amazon ant-plants, p.239-266. In Prance G, Lovejoy T E (eds) Key environments: Amazonia. Oxford, Pergamon Press, 442p.
- Cuezzo F (2003) Subfamilia Dolichoderinae, p.291-297. In Fernández F (ed) Introducción a las hormigas de la región Neotropical. Bogotá, Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, 424p.
- Davidson D W, Foster R, Snelling R R, Lozada P W (1991) Variable composition of some tropical ant-plant symbioses, p.145-162. In Price P W, Lewinsohn T M, Fernandes G W, Benson W W (eds) Plant-animal interactions: evolutionary ecology in Tropical and Temperate regions, New York, Wiley, 639p.
- Dejean A, Grangier J, Leroy C, Orivel L (2008) Predation and aggressiveness in host plant protection: a generalization using ants from the genus *Azteca*. *Naturwissenschaften* 96: 57-63.
- Forel A (1899) Formicidae. *Biol Centr Amer Hym* 3: 1-169.
- Harada A Y (1989) Estrutura de colônias de *Azteca alfari* (Formicidae: Dolichoderinae) em plantas do gênero *Cecropia* (Moraceae). *Rev Bras Entomol* 33: 169-182.
- Harada A Y, Benson W W (1988) As espécies de *Azteca* (Hymenoptera: Formicidae) especializadas em *Cecropia* (Moraceae): Distribuição geográfica e considerações ecológicas. *Rev Bras Entomol* 32: 423-435.
- Kempf W W (1972) Catálogo abreviado das formigas da região neotropical. *Stud Entomol* 15: 3-344.
- Nehmi Filho V A, Silva M L M, Marinho L K (2002) Laranja: produção se ajusta à demanda, p.285-288. In Izabel M D N (ed) *Agriannual 2002: anuário da agricultura brasileira*. São Paulo, FNP Consultoria & Comércio, 536p.
- Oeiras A H L (2002) Manejo integrado de pragas e doenças de citros no estado do Pará, p.25-32. In Poltronieri L S, Trindade D R (eds) *Manejo integrado das principais pragas e doenças de cultivos amazônicos*. Belém, Embrapa Amazônia Oriental, 284p.

*Received 16/X/09. Accepted 16/V/10.*

---