



## Influence of Selective Logging on Scolytinae and Platypodinae (Curculionidae) in an Amazonian Forest of Santarém (Brazil)

Maria Katiane S. Costa<sup>1,3</sup>; Cezar D. C. Júnior<sup>1,3</sup>; Marcelle B. Melo<sup>1,3</sup>; Alessandra S. Batista<sup>1,3</sup>; Pablo Antonio S. A. da Luz<sup>1,3</sup>; Arlison B. Castro<sup>2</sup>; Rodrigo F. Fadini<sup>2</sup>; Adenomar N. Carvalho<sup>3</sup>; Sílvia Y. Tanabe<sup>4</sup>; Carlos Alberto H. Flechtmann<sup>4</sup>

<sup>1</sup>Undergraduate in Engenharia Florestal, UFOPA, R. Vera Paz s/n., 68035-110 Santarém PA Brazil. Email: katiamecosta30@gmail.com.

<sup>2</sup>Laboratory of Ecology and Conservation - UFOPA. <sup>3</sup>Laboratory of Entomology - UFOPA. <sup>4</sup>Department of Plant Protection, FEIS/UNESP, Ilha Solteira SP Brazil.

Selective logging is considered to be a practice that allows for economic exploitation of tropical forests while reducing the impact on its biodiversity. We were interested in evaluating the impact of selective logging on Scolytinae and Platypodinae (Curculionidae) beetles in a terra firme ombrophilous forest fragment of the National Forest of Tapajós, in Santarém, state of Pará, Brazil. There were two areas, an unlogged and a selectively logged one, ca 1.8 km apart from each other. We sampled for these beetles with light traps in both areas before (June-July 2014) and after (June-July 2015) the logging operation (mid August-December 2014). There were 8 replications/area, and we collected for two nights in a row (6.5 h/night) within each sampling point and logging period. Despite the low sampling effort, 36 Scolytinae species were trapped, in 17 genera. Twelve Platypodinae species were also collected, within *Euplatypus*, *Teloplatypus* and *Tesserocerus*. While the diversity in both areas before logging was similar, evenness was two times higher in the area to be logged. After logging, both diversity and evenness were higher in the logged than in the control area. Abundance of the 11 more trapped species was similar in both areas before the logging operation, except for *Xyleborus ferrugineus*, significantly more trapped in the unlogged area. After logging, *Coptoborus* sp., *Micracis* sp., *Premnobius cavipennis* and *Xyleborus* nr. *volvulus* were significantly more trapped in the logged area, while there were no differences between areas for the other species. Most of these beetles are able to breed in the generated logging residue material. Hence, it is likely that the increase in diversity, evenness and abundance for these beetles resulted from the increase of plant breeding material. Further collecting, after the logging residue is no longer suitable for beetle breeding, is necessary to ascertain if this influence is temporary or longer lasting.

**Keywords:** ambrosia beetle, xylomycetophagous, diversity.

## Insecticidal activity of a protein preparation from *Moringa oleifera* flowers against *Nasutitermes corniger* (Isoptera: Termitidae)

Welton A. de Almeida<sup>1</sup>; Maiara C. de Moura<sup>1</sup>; Thâmarah de A. Lima<sup>1</sup>; Luiz F. B. de Barros<sup>1</sup>; Luana C. B. B. Coelho<sup>1</sup>; Patrícia M. G. Paiva<sup>1</sup>; Thiago H. Napoleão<sup>1</sup>; Emmanuel V. Pontual<sup>2</sup>

<sup>1</sup>Departamento de Bioquímica, Centro de Ciências Biológicas, Universidade Federal de Pernambuco, Avenida Prof. Moraes Rego, S/N, Cidade Universitária, Recife-PE, 50670-420, Brazil. <sup>2</sup>Departamento de Morfologia e Fisiologia Animal, Universidade Federal Rural de Pernambuco, Recife-PE, 52171-900, Brazil.

*Nasutitermes corniger* is an arboreal and soil-feeding termite that causes damage by degrading buildings, paintings, books, and monuments. *Moringa oleifera* is a tree that has been explored for medical, economic and industrial purposes. This work investigated the effects of a *M. oleifera* flower protein preparation (PP) on the survival of *N. corniger*. The effects of PP on trypsin activity and growth of microbiota from termite gut were also evaluated. Dried flowers (10 g) were homogenized with 0.15 M NaCl (100 ml) for 16 h at 4°C. The mixture was filtered and treated with ammonium sulfate at 60% saturation. After centrifugation, the precipitated protein fraction was solubilized in 0.15 M NaCl and named PP. The termiticidal assay was performed in Petri dishes containing a disk (4 cm diameter) of filter paper soaked with PP (200 µL, 1.0 mg/mL). Each plate received 20 termites (16 workers and 4 soldiers) and was incubated in the dark at 28±5°C. The mortality rate was recorded daily during 11 days. The experiments were carried out in quintuplicate and 0.15 M NaCl was used as control solution. Trypsin activity was assayed using an extract from workers gut in 0.1 M Tris-HCl pH 8.0 and the substrate N-benzoyl-DL-arginyl-p-nitroanilide in absence and presence of PP. The effect of PP on growth of microbiota from workers gut was assayed using the broth microdilution method and the minimal inhibitory concentration (MIC) was determined. PP promoted 100% mortality of workers after 7 days, while in control, a mortality rate of 100% was only recorded after 11 days. PP was not deleterious for soldiers. Trypsin activity from workers gut was abolished by PP (0.45 mg), which was able to inhibit the growth of microbiota from workers gut (MIC of 0.037 mg/mL). In conclusion, *M. oleifera* flowers are source of termiticidal proteins against *N. corniger* workers and the mechanism of their effect can include the blocking of gut trypsin activity and the inhibition of growth of gut microbiota.

**Keywords:** Termiticidal activity, moringa, microbiota.

**Support:** FACEPE, CAPES, CNPq.