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PLANT-DERIVED INSECTICIDES: THE POTENTIAL OF CERRADO VEGETATION AGAINST LEAFCUTTER-ANTS

Eduarda Oliveira dos Santos[1*], Gabriele Fernanda da Silva[1], Anderson do Rego Pires[1] Lulliana Thalita Franco[1], Raul Vinícius Silva[2] Odair Correa Bueno[2], Maria Fátima das Graças Fernandes da Silva[1], João Batista Fernandes[1]

eduardaosantos853@gmail.com

1-Laborátorio de Produtos Naturais, Departamento de Química, UFSCar, Rod. Washington Luís, s/n - Monjolinho, São Carlos - SP, Brazil. 2- CEIS-Centro de estudos de insetos sociais, Instituto de Biociência, UNESP, Av. 24-A, nº1515, Rio Claro-SP, Brazil.

Leafcutter ants remain among the most damaging agricultural pests in South America, causing severe economic losses in pinus and sugarcane crops. In the search for new approaches to integrated pest management and to reduce the environmental impact of conventional pesticides on non-target organisms, natural products with specific insecticidal activity have gained increasing attention. *Nectandra rigida* (Lauraceae), is a cerrado vegetal species, known as a notable font of alkaloids and lignans of insecticidal potential. This work aimed to investigate the insecticidal potential of methanolic stem extract of *Nectandra rigida* against the leafcutter ant (*Atta sexdens)*, and the symbiotic fungi *Leucoagaricus gongilophorus*. The effect of the metabolites in the acetylcholinesterase enzyme (AsAChE) was evaluated as well as the proposed of specific action of natural-based insecticides. Stem extracts were evaluated through laboratory bioassays with worker ants, showing 98% of mortality within 9 days. Additionally, AsAChE inhibition assays were carried out using biosensors to explore a possible mechanism of action, as indicated by the inhibition of 31% of the activity at a 5 mg/mL concentration. Thus, the stem extract induced a 16 mm halo of inhibition of the symbiotic fungi, suggesting a multi-target insecticidal effect. Ongoing spectroscopic and chromatographic analyses aim to characterize the chemical profile of the extract and identify the secondary metabolites responsible for the observed activities. These findings highlight *Nectandra rigida* as a promising natural source of bioinsecticides, for the management of leafcutter ants.

Keywords: Leafcutter ants*, Nectandra Rigida,* acetylcholinesterase*, Leucoagaricus gongilophorus*