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INSECTICIDAL POTENTIAL OF Parahancornia amapa (Apocynaceae) AGAINST Atta sexdens: ISOLATION AND CHARACTERIZATION OF BIOACTIVE COMPOUNDS

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Leaf-cutter ants of the genera *Atta* and *Acromyrmex* rank among the most destructive agricultural pests due to their aggressive herbivory. The widespread and indiscriminate use of synthetic pesticides to control these insects has led to severe environmental impacts, threatening ecosystem integrity and posing significant public health risks. In this context, Natural Products Chemistry emerges as a sustainable and promising approach, enabling the isolation of secondary metabolites with potential insecticidal activity. The Amazonian species *Parahancornia amapa* (Huber) Ducke is traditionally used as a natural insecticide, was investigated through exhaustive extraction, followed by chromatographic fractionation using silica gel (230–400 mesh), high-performance liquid chromatography (HPLC), LC coupled with mass spectrometry (LC-MS/MS), and nuclear magnetic resonance (NMR), enabled the isolation of previously unreported compounds in this species. Toxicity bioassays conducted with extracts and fractions from the twigs and leaves of *P. amapa* against medium-sized worker ants of *Atta sexdens* guided the isolation of bioactive metabolites. From the twig fraction, two novel alkaloids, a new pterocarpan derivative, and a previously unreported benzopyran were isolated. From the leaf fraction, three compounds were identified: an aryl-naphthalene lactone Justicidin B and two known flavonoids catechin and quercetin. The bioactive fractions from both twigs and leaf, from which these compounds were isolated, induced 100% mortality ($p < 0.05$) of *A. sexdens* worker ants within 12 and 14 days, respectively. Furthermore, the twig fraction exhibited inhibitory activity against *A. sexdens* acetylcholinesterase (*As*AChE), with IC_{50} values of 12.96 mg·L^{-1} (± 1.02) for isoform A and 9.51 mg·L^{-1} (± 0.35) for isoform B, suggesting a neurotoxic mechanism of action. These findings highlight *P. amapa* as a promising natural source of insecticidal compounds, reinforcing its potential as an eco-friendly alternative to conventional synthetic pesticides for the control of leaf-cutter ants.

Keywords: Natural Products, *P. amapa,* Insecticide, *Atta sexdens, As*AChE.