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ANTI-PROTOZOAN RESPONSE OF PRODUCTS FROM Duguetia stelechantha

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Duguetia stelechantha, known as ata brava, is a tree of the Annonaceae family. Different species of the Annonaceae family have been reported to be biologically active, and Duguetia species have been identified metabolites from different classes that perform promising biological activities, such as essential oils (EOs) with proven antiprotozoal activity. There are few chemical and biological records of *D. stelechantha* in the literature, so this study aimed to investigate the biotechnological potential of the species. The aim was to obtain EO from *D. stelechantha* leaves (EO-DU), develop a microemulsion (ME) (ME-DU) to incorporate the EO, and evaluate the antiprotozoal activity of these bioproducts. Chemical characterization by GC/MS of the hydrodistilled EO-DU identified β-pinene (46.17%), α-pinene (20.2%), and spathulenol (6.68%) as the major constituents. Headspace GC/MS analysis of ME-DU confirmed the incorporation of EO in the formulation. Physicochemical characterization of ME indicated that particle size, polydispersity index, and zeta potential are in accordance with the literature. The antiprotozoal activity evaluated the action of these natural products on *Leishmania* (L.) *amazonensis* promastigotes, which classified ME-DU (IC_{50}=4.47 µg/mL) as an active sample, and EO-DU (IC_{50}=138.30 µg/mL) and the ME blank (IC_{50}=185.60 µg/mL) as moderately active. ME-DU had a lower IC_{50} than EO-DU, providing an antileishmanial action approximately 30 times more effective than EO-DU. ME-DU also achieved an IC_{50} close to that of the drug used as a positive control, pentamidine (IC_{50} = 4.00 µg/mL). The selectivity index (S.I) indicates whether a sample is more toxic to the parasite or the cell. After cytotoxicity testing in Raw 264.7, the S.I was calculated, indicating that EO-DU (CC_{50}=44.77µg/mL) is more toxic to cells than to the parasite. ME-DU (CC_{50}=8.87µg/mL) is more selective for parasite inhibition and less cytotoxic, as the IC_{50} for *L.* (L) *amazonensis* is lower than what is considered cytotoxic. The results demonstrate the potential of the species, and the incorporation of EO into ME increased the bioavailability of bioactives, optimizing biological activity, and reduced the toxicity of compounds. The authors thank the support from their institutions and the financial support of PPBioAmar/CNPq, FAPEMA and CAPES.

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