



INTRASPECIFIC/INTERPOPULATIONAL VARIATION AND EVALUATION OF ANTI-*LEISHMANIA* ACTIVITY OF CONSTITUENTS FROM LEAVES VOLATILE OILS OF *Guarea macrophylla* (MELIACEAE)

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Guarea macrophylla Vahl. ssp. *tuberculata* Vellozo (Meliaceae), popularly known as Ataúba, grows in Brazil from Rio Grande do Sul to the Amazonas region. Chemically, this plant produces several metabolites, including terpenoids, flavonoids and lignoids [1]. Despite these chemical data, there are few studies focused on the biological activity. This work reported the intraspecific/interpopulational variation in chemical composition of volatile oils from leaves of *G. macrophylla*, obtained in two different regions of SP, as well as the *in vitro* antileishmanial activity to each obtained oils. Experimentally, were collected five samples of two different specimens located on the cities of São Paulo (I) (S23°33.929'–T046°43.850') and Cubatão (II) (S23°50.567'–T046°24.874') during February, May, August, November/2013 and in February/2014. Crude oils, obtained by hydrodistillation using a Clevenger apparatus, were analyzed by FID-GC and CG-MS as well as determination of Kovats indices [1]. The oils from the two different plants showed chemical similarity since the sesquiterpenes were identified as main compounds, corresponding to 73.3 ± 0.6 – 85.9 ± 0.8 % (specimen I) and 68.2 ± 1.7 – 80.8 ± 1.8 % (specimen II). Specimen I oils were composed essentially from *cis*- β -guaiene (7 ± 1 – 18 ± 4 %), bicyclogermacrene (7 ± 2 – 13 ± 2 %), viridiflorol (6.3 ± 0.6 – 8.4 ± 0.6 %) and isolongifolan-7 α -ol (6.6 ± 0.6 – 11 ± 4 %). In addition to these compounds, were identified the diterpenes manoyl oxide (3.5 ± 0.1 – 8 ± 2 %) and isopimara-7,15-dien-3-one (2.5 ± 0.3 – 5.3 ± 0.7 %) as majority compounds. Specimen II oils were composed mainly by α -copaene (4 ± 2 to 14 ± 2 %), (*E*)-caryophyllene (9 ± 3 to 18 ± 8 %), *cis*- β -guaiene (7 ± 3 to 18 ± 7 %) and δ -amorphene (3.9 ± 0.8 to 7 ± 1 %) as well as the diterpene isopimara-7,15-dien-3 β -ol (2.2 ± 0.4 a 7 ± 4 %). The observed intraspecific/interpopulational variation could be related to several anthropogenic as well as microclimatic factors, such as temperature and rainfall [2]. Phenological aspects could also explain the observed variation since in the flowering period (August), the level of hydrocarbon sesquiterpenes in the oils was lower than the other collection months. The same behavior was observed with the content of oxygenated diterpene derivatives which increased during the flowering periods. The opposite was observed when the oils were obtained from plants in their vegetative state, in which the non-oxygenated derivatives (both sesquiterpenes and diterpenes) were the major components. The antiparasitic activity of crude volatile oils was evaluated against promastigotes and amastigotes from *Leishmania (L.) amazonensis* [3]. Crude volatile oils displayed EC₅₀ values ranging from 11.8 ± 5.2 to 17.2 ± 5.1 μ g/mL (specimen I) and from 12.0 ± 1.2 to 20.5 ± 2.7 μ g/mL (specimen II), indicating a moderate anti-promastigote action. Similarly, was observed a moderate anti-amastigote effect to the oils from specimen II, with EC₅₀ ranging from 17.7 ± 4.6 to 27.9 ± 3.8 μ g/mL, while EC₅₀ to oils from specimen I were higher than 70 μ g/mL. Additionally, selectivity indexes (cytotoxicity against macrophage J774) were determined to all tested oils with values of approximately 6 and 2 to specimens I and II, respectively. Interestingly, the higher SI values were observed in the oils obtained in periods in which bicyclogermacrene was detected as main compound. Due the potential to purified compound (EC₅₀ = 8.9 ± 0.7 μ g/mL, SI = 8), the antileishmanial activity to crude oils could be related to the presence of this sesquiterpenes. (CNPq and FAPESP).

References

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