



CHEMICAL PROFILE AND BIOLOGICAL EVALUATION OF THE ESSENTIAL OIL FROM *EUGENIA MYRCIANTHES* (MYRTACEAE)

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The Myrtaceae family comprises several species recognized for producing essential oils of economic and pharmacological relevance. Within this family, *Eugenia myrcianthes* Nied. is a South American native tree, widely distributed in Brazil, Paraguay, and Argentina, but still poorly studied in terms of phytochemistry and biological activities. In this study, the essential oil from *E. myrcianthes* leaves was extracted by hydrodistillation using a Clevenger-type apparatus for three hours, yielding 0.03% (w/w) based on dry plant weight. The oil was dried over anhydrous sodium sulfate, filtered, and stored at 4 °C in amber vials until analysis. The chemical composition was determined by gas chromatography–mass spectrometry (GC-MS) and gas chromatography with flame ionization detection (GC-FID). More than 95% of the constituents were identified, showing a predominance of sesquiterpenes. The main compounds were germacrene D (23.2%), α -cadinol (10.8%), α -selinene (8.8%), β -elemene (7.3%), (*E*)-caryophyllene (6.8%), and δ -cadinene (5.5%), along with minor constituents such as spathulenol, globulol, and nerolidol. This profile is consistent with other *Eugenia* species, which often contain high levels of bioactive sesquiterpenes. Biological evaluation included cytotoxic assays against human tumor cell lines (HeLa, MCF-7, U-251MG) and non-tumoral fibroblasts (GM07492A), as well as leishmanicidal activity against *Leishmania* (*L.*) *amazonensis* promastigotes and virucidal activity against Mayaro virus (MAYV). The essential oil showed higher cytotoxicity toward fibroblasts ($IC_{50} = 16.6 \pm 2.2 \mu\text{g/mL}$) than toward tumor cells, indicating a lack of tumor selectivity. In antiparasitic assays, the oil exhibited weak leishmanicidal activity ($EC_{50} > 50 \mu\text{g/mL}$) with inhibition below 40%. Virucidal assays also showed low activity, with $17.2\% \pm 4.8$ inhibition of MAYV replication at $13.4 \mu\text{g/mL}$. In conclusion, the essential oil of *E. myrcianthes* is chemically rich in sesquiterpenes and contributes to the scarce phytochemical knowledge of this species. Although the biological activities evaluated here were of low potency and without tumor selectivity, the predominance of bioactive sesquiterpenes suggests that this oil may display stronger effects in other pharmacological models not yet explored. Moreover, since several major constituents (e.g., germacrene D, α -cadinol, (*E*)-caryophyllene) are reported as insecticidal, the oil may also hold potential against agricultural pests such as caterpillars and leaf-cutting ants, warranting further investigations.

Keywords: *Eugenia myrcianthes*; Myrtaceae; essential oil; sesquiterpenes; biological activities

