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Antioxidant activities of extracts from *Hyptis* spp. (Lamiaceae)

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Hyptis is a genus of Lamiaceae, comprising approximately 144 species distributed in tropical and subtropical regions from North America to the Caribbean and southward to Argentina and Peru. Production of reactive oxygen species **(ROS)** causes various diseases and cellular anomalies. Antioxidants inhibit the generation of ROS by scavenging them, or raising the levels of endogenous antioxidant defenses. Phenolic compounds are very important plant constituents that exhibit antioxidant activity by inactivating lipid free radicals, or preventing the decomposition of hydroperoxides into free radicals. In this study the antioxidant activity as well as total phenolic and flavonoid contents of *Hyptis radicans* and *Hyptis multibracteata* were investigated. *H. radicans* and *H. mutibracteata* are species from the Atlantic Forest, easily found in Paranapiacaba, SP, Brazil, and currently there is no information about their pharmacological potential. The antioxidant activity was determined by the 2,20-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt **(ABTS)** free radical decolorization assay and the ferric reducing antioxidant power assay **(FRAP)**. Amount of total phenolic **(TP)** was analyzed by the Folin-Ciocalteau assay, while the amount of total flavonoid **(TF)** were analyzed using the aluminum chloride colorimetric assay. Plant material was collected, dried at 40 °C, powdered and subjected to maceration using 70% ethanol for 7 days at room temperature in the dark. Ethanol crude extract **(EC)** was fractionated using ethyl acetate **(EAF)** and hexane **(HEF)**. All samples were dissolved in DMSO 10% to achieve concentrations of 100 to 1000 µg mL^{-1}. Trolox, gallic acid and quercetin were used as a positive control. Results for ABTS assay revealed that *Hyptis radicans* (EC_{50} 6.01 µg mL^{-1}) and *H. multibracteata* (EC_{50} 23.17 µg mL^{-1}) have potent antioxidant activity when comparing to Trolox (EC_{50} 10.21 µg mL^{-1}). **EAF** showed EC_{50} of 5.04 µg mL^{-1}, *H. radicans*, and 17.60 µg mL^{-1}, *H. multibracteata* (Trolox EC_{50} 13,75 µg mL^{-1}) on FRAP assay. *H. radicans* total phenolic and flavonoid contents on **EAF** and **HEF** were the highest amount, 467.34 mg GAE g^{-1} and 14.18 mg ER g^{-1}, respectively. *H. multibracteata* **EAF** and **HEF** showed higher amounts of TP and TF than other samples, 13.39 mg GAE g^{-1} and 15.65 mg ER g^{-1}. All extracts were analyzed by HPLC-DAD and the major compounds found were flavonoids, phenylpropanoids and their derivatives, even in the hexane fraction. According to the results, *H. radicans* and *H. multibracteata* are promising species to the search for substances with antioxidant activity.

Keywords: Lamiaceae, phenylpropanoids, flavonoids

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