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Metabolomic Profiling of *Ternstroemia brasiliensis* from Jurubatiba Sandbank Phytophysiognomies (Rio de Janeiro, Brazil) and Evaluation of its Antioxidant Potential

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Jurubatiba Sandbank National Park (PARNA Jurubatiba), located in the northern region of the state of Rio de Janeiro, is a protected area that harbors xeromorphic plant species distributed across different phytophysiognomies. *Ternstroemia brasiliensis* (Pentaphylacaceae), commonly known as "pinta-noiva" can be found in different phytophysiognomic formations of the PARNA Jurubatiba, such as Clusia Open Shrub Formation (COSF) and Ericacea Open Shrub Formation (EOSF), commonly exposed to high temperatures, low rainfall, sandy soil, among other. Phytochemical studies of species from the genus *Ternstroemia* have reported the isolation of oleanane- and ursane-type triterpenes, triterpenoid saponins and *O*-glycosylated flavonoids. Biopharmacological investigations of the genus have demonstrated notable antioxidant activity. Therefore, the present study aims to carry out an untargeted metabolomic analysis of *T. brasiliensis* extracts obtained from different phytophysiognomies, in different seasons, and to evaluate their antioxidant potential. Leaves of *T. brasiliensis* (n= 14; COSF and EOSF) were collected in the summer (-S) and autumn (-A) seasons and stored at -80ºC. The dry and crushed material was extracted with MeOH:H_2O (8:2). The analyses were performed in an Agilient 1290 infinity II HPLC system coupled to a timsTOFBruker® with ESI source, in the positive ionization mode. Data processing was performed in MetaboScape®, and the data analysis in the Sirius 5.8, Metlgel, GNPS2, and Metaboanalyst 6.0. The extracts were subjected to the DPPH antioxidant assay in order to evaluate their capacity to capture and neutralize the 1,1-diphenyl-2-picrylhydrazyl radical, using rutin as standard. *O*- and *C*-glycosyde flavonoids were annotated in *T. brasiliensis* at COS and EOS formations, in both seasons. The *C*-glycosyde flavonoids is being reported for the first time for this species. An unsupervised principal component analysis (PCA) enabled the assessment and grouping of samples based on the variance in their chemical profiles. The preliminary evaluation of antioxidant potential using the DPPH method showed promising results for summer extracts, from distinct phytophysiognomies. Among the extracts of *T. brasiliensis*, specimens collected at EOSF-S showed EC_{50} values at 6.01 µg/mL, compared to 1.45 µg/mL for rutin. The antioxidant assays for COSF-S are currently underway. Through this study it was possible to detect flavonoids as the compounds, and antioxidant potential of the *T. brasiliensis*.

Keywords: Antioxidants; Jurubatiba Sandbank; phytophysiognomies; *Ternstroemia brasiliensis*; Untargeted Metabolomics.