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## LC-HRMS BASED METABOLITE AND PHYTOCHEMICAL ANALYSIS OF *Maranta arundinacea* L. FOR THE FUNCTIONAL ASSESSMENT OF UNCONVENTIONAL FOOD PLANTS (UFP)

**Yasmine Fernandes Oliveira<sup>1\*</sup>**, Jorge Luiz Souza Simão<sup>1</sup>, Rodolfo Dantas Lima Junior<sup>2</sup>, Maurício Vicente Cruz<sup>3</sup>, Kátia Flávia Fernandes<sup>3</sup>, Patricia Santos Lopes<sup>4</sup>, Taícia Pacheco Fill<sup>2</sup> and Vanessa Gisele Pasqualotto Severino<sup>1</sup>

yasminefernandes@discente.ufg.br

1 - Universidade Federal de Goiás, Chemistry Institute, 74690-900 Goiânia, Goiás, Brazil. 2 - Universidade Estadual de Campinas, Chemistry Institute, 13083-970, Campinas, São Paulo, Brazil. 3 - Universidade Federal de Goiás, Biological Science Institute, 74690-900 Goiânia, Goiás, Brazil. 4 - Universidade Federal de São Paulo, Institute of Environmental, Chemical and Pharmaceutical Sciences, 09972-270, Diadema, São Paulo, Brazil.

The growing demand for healthy and affordable food has increased interest in Unconventional Food Plants (UFP), which remain undervalued despite their high nutritional value<sup>(1)</sup>. This trend aligns with the United Nations Sustainable Development Goal 2, which emphasizes food security and sustainable agriculture. Among UFP, *Maranta arundinacea* L. (“aratura”) is noteworthy for its starch-rich rhizomes and the largely unexplored nutritional and pharmacological potential of its aerial parts<sup>(2)</sup>. This study investigated the anti-nutritional profile, annotated compounds using public spectral libraries, and evaluated the cytotoxic activity of *M. arundinacea*. Aerial (AP) and rhizomatic (RP) parts (SISGEN A2DB3EC) were collected in Goiânia, Brazil, washed, lyophilized, and extracted with methanol via ultrasound-assisted extraction for 1 h at 15 °C. The extracts were then tested for trypsin and  $\alpha$ -amylase inhibitory activities, analyzed by LC-HRMS, and dereplicated through Feature-Based Molecular Networking (FBMN) using the Global Natural Products Social Molecular Networking (GNPS) platform. Phenolic compounds, flavonoids, and proanthocyanidins were quantified spectrophotometrically, and antioxidant activity was assessed using ABTS<sup>+</sup>, DPPH, and FRAP assays. Cytotoxicity was evaluated using HaCaT (HE662121) cells using the neutral red assay<sup>(3)</sup>. LC-HRMS analysis of AP and RP extracts enabled Level 3 annotation of 48 compounds in [positive](#) and 9 in [negative](#) ionization mode, curated through GNPS spectral libraries. Rutin ( $m/z$  611.1612), quercetin ( $m/z$  303.0504), and kaempferol 3-hexoside-6-hexoside-hexoside ( $m/z$  741.2236) were detected and they are known for several pharmacological activities. The antioxidant potential of both extracts was confirmed by the ABTS<sup>+</sup> ( $0.11 \pm 0.05^A$  and  $0.05 \pm 0.02^B$  mmol TE/g), DPPH ( $3.27 \pm 0.03^A$  and  $8.32 \pm 0.15^A$ ), and FRAP ( $0.07 \pm 0.03^A$  and  $0.03 \pm 0.02^A$  mmol TE/g) assays. Toxicological assessment classified the RP extract as Dermal Toxicity Category 5 ( $IC_{50}$   $3.61 \pm 0.53$  mg/mL) according to OECD guidelines, indicating low acute toxicity with potential risk only for vulnerable groups. The AP extract was non-cytotoxic, maintaining cell viability above 93%. Overall, both extracts exhibit bioactive profiles combined with low toxicity, making them promising candidates for safe application in food products and dietary supplements.

**Keywords:** *Maranta arundinacea* L., Unconventional food plants, UHPLC-HRMS/MS, Molecular networking, Antioxidant activity.

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