



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

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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.

**(1)** KINUPP and LORENZI. *Nova Odessa*, 1<sup>th</sup> ed, p. 1 - 768, 2014. ISBN: 978-65-87655-02-4. **(2)** SILVA, *et al.* *Conex. Ci. e Tecnol.*, v.16, p. 01-06, e022015, 2022. **(3)** OLIVEIRA, *et al.* *Food Res. Int.*, v. 212, e116462, 2025.

