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SEASONAL EVALUATION OF THE CHEMICAL COMPOSITION OF Piper Fuligineum AND Piper Macedoi ESSENTIAL OILS

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Natural products from plants continue to be a key resource for the discovery of bioactive compounds with pharmaceutical, agricultural, and ecological relevance. The genus *Piper* is especially rich in secondary metabolites, many of which show insecticidal, ovicidal, and larvicidal potential. This study focuses on the metabolomic characterization of two morphologically similar species, *Piper macedoi* and *Piper fuligineum*, both known for their bioactivity and native to southeastern Brazil. Both species are shrubby, found near water sources, sometimes with their roots submerged. The fruits appear in spike-like structures, with is characteristic of the genus as a whole. The leaves are similar in shape; however, the main morphological difference lies in their texture and size: *P. fuligineum* has smaller and rougher leaves compared to the smoother and larger leaves of *P. macedoi*. The plants were collected in close proximity, less than 100 meters apart, at the "Fazenda Experimental do Glória" (UFU, Uberlândia, MG), minimizing environmental variability. Leaf samples (Herbarium code at the University of Brasília: 311774 for *P. fuligineum* and 311780 for *P. macedoi*) were collected every two months over the course of one year (September 2024, November 2024, January 2025, March 2025, and May 2025). Essential oils were obtained by hydrodistillation (yields – *P. macedoi*: 0.206 ± 0.029 %; *P. fuligineum*: 0.201 ± 0.029 %) and analyzed using GC-MS and GC-FID. The aim is to investigate differences in the chemical profiles of the two species throughout seasonal changes, in order to understand how environmental variation affects the metabolic responses of each species. Although morphologically similar, *P. macedoi* and *P. fuligineum* may exhibit distinct chemical adaptation strategies, which can aid in species differentiation and provide insights into their ecological roles and biotechnological potential. Acknowledgments: FAPEMIG, CAPES and CNPq.

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