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VOLATILE PROFILE AND MOLECULAR CHARACTERIZATION OF Piper (PIPERACEAE) SPECIES OCCURING IN THE AMAZON

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Studies on the chemical variability and molecular characterization of the genus *Piper* are essential to understand the range of traits expressed within and among species. This study aimed to characterize different chemotypes of *Piper* species occurring in the state of Pará, Brazil, and to evaluate their genetic diversity. Twenty-three samples were collected in Altamira, Bagre, Bragança and Metropolitan Region of Belém. Essential oils were obtained by hydrodistillation (3 h) and analyzed by gas chromatography–mass spectrometry (GC-MS). The most abundant compounds detected were dillapiole (0–93.4%), *E*-nerolidol (0-30.6%), eugenol (0–26.3%), methyl eugenol (0–23.0%), limonene (0–19.6%), *E*-caryophyllene (0.2–19.0%) and α-pinene (0–15.5%). Principal component analysis of the chemical profiles grouped the samples into five chemotypes characterized mainly by: Group I was differentiated by the highest percentage of compounds belonging to classes of Alkanes, Aldehydes, Alcohols, Ketones and Esters (14.7%), although the major ones were Oxygenated Sesquiterpenes (OS, 25.4%) followed by Monoterpene Hydrocarbons (MH, 23.0%); Group II was distinguished by the presence of Diterpenes (DT, 9.8%) and high values of Monoterpene Hydrocarbons (MH, 20.6%) and OS (20.0%); Group III was characterized by the highest levels of Phenylpropanoids (PP, 60.4-66.4%) followed by SH (12.9-29.4%); Group IV grouped the samples with the highest levels of HM (34.8-59.8%) and high OS levels (11.4-27.3%); finally, Group V presented the highest SH (27.9-70.2%) and OS levels (10.9-50.4%). Molecular characterization was performed from the sequencing of the ITS region and revealed 14 haplotypes among 20 individuals, with haplotype diversity (Hd = 0.963) and nucleotide diversity (π = 0.06745), indicating high variability. Besides, the ITS sequences presented 82 parsimony informative sites and 100 polymorphic sites, totaling 127 mutations, indicating the potential of the ITS gene to be used as barcode for *Piper* genus. Overall, the *Piper* species from Pará exhibited marked chemical heterogeneity and haplotype diversity, contributing to the understanding and documentation of their chemical and molecular characterization and potential for applied uses. The authors thank the support CAPES and CNPq.

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