

Mineral element determination and phenolic compounds profiling of oleoresin extracts using an accurate mass LC-MS-QTOF and ICP-MS

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ABSTRACT

The nutraceutical potential of black and white pepper has drawn the attention of many researchers to unravel their pharmaceutical and nutritional properties. These properties could be attributed to the presence of some essential bioactive compounds and mineral elements. This study, therefore, investigated the phenolic and mineral element composition in their oleoresin extracts, using a set of physicochemical and characterization protocols. The result obtained at optimum condition gave a total of 17 and 20 phenolic compounds in black and white pepper extracts, respectively. Moreover, four essential mineral elements (Na, Mg, K, and Ca) were detected. The presence of hazardous elements such as Ar, Se, Pb, and Cr, below the detection limit (BDL) indicated the edibility of the oleoresin extracts. The total phenolic content (TPC) in both extracts was evaluated using Folin-Ciocalteu assay. The result showed that the white pepper extract exhibited higher total phenol content (63.40 ± 0.096 mg GAE/g d.w) than black pepper extract (51.95 ± 0.025 mg GAE/g d.w). The combined action of the mineral elements, total phenolic content and the phytochemical profiles confirmed the potential of oleoresin extracts as natural antioxidants in food and pharmaceutical industries.

KEYWORDS: Black and white pepper; Metabolomics; Total phenolic content (TPC); LCMS-QToF; ICP-MS