

GC-MS profiling of bioactive phytoconstituents in methanolic fruit extract of *Capparis zeylanica* L. Insights into medicinal potential

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Abstract

Medicinal plants play an important role in pharmacology because many pharmaceutical companies rely on them for drug development. Over the years plants have provided a wealth of bioactive molecules that contribute not only medicines but also fragrances, food colors, and flavors worldwide. Herbal medicines are typically prepared from crude plant extracts containing diverse phytochemicals, known as secondary metabolites, which vary among species. Due to this complexity, there is an increasing focus on validating and standardizing herbal products. *Capparis zeylanica* L., belonging to the Capparaceae family, commonly known as Arudonda, is an important medicinal plant used in traditional medicine to treat various diseases. The main aim of the present investigation was to identify bioactive phytochemicals in methanolic fruit extract using GC-MS technique. The GC-MS analysis revealed the presence of 42 different types of low- and high-molecular-weight phytochemicals and bioactive compounds in varying quantities. The major bioactive compounds were 9-Octadecenoic acid, (E)- (RT 21.099; 55.76%), Methyl tetradec-5-ynoate (RT 21.337; 14.88%), Octadecanoic acid (RT 21.29; 6.12%), Tetradecanoic acid (RT 19.236; 3.75%), and 9-Octadecenoic acid, methyl ester (RT 20.627; 1.41%). The findings show that *C. zeylanica* fruits have a high concentration of multifunctional phytochemicals, which supports their usage in traditional medicine and provides a chemical foundation for potential therapeutic development.

Keywords: *Capparis zeylanica*, medicinal plant, fruit, GC-MS analysis, bioactive compounds