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Mimosa pudica L.: A comparative study via in vitro analysis and GC Q-TOF MS profiling on conventional and supercritical fluid extraction using food grade ethanol (Article)

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Abstract

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The present study compared conventional (maceration) extraction (EtOHconv) and supercritical fluid extraction (SFE) methods as a mean of comparing conventional and green process for a weed namely *Mimosa pudica* L. to obtain a safe antidiabetic natural agent. In vitro analysis comprised of two different assays, antioxidant assay (determination of total phenolic content, total flavonoid content, and 2,2-diphenyl-1-picrylhydrazyl assay) and antidiabetic assay (inhibition of α -amylase and α -glucosidase). GC Q-TOF MS profiling for both extracts was done after derivetisation to confirm the presence of bioactive compounds. SFE was performed at 40 MPa pressure, 60 °C temperature and 5 mL/min CO₂ flow rate using 30 % ethanol (co-solvent) for 2 h. EtOHconv prepared using 95 % ethanol through conventional method (maceration) showed a good in vitro antioxidant potential and digestive enzymes inhibitory effect compared to supercritical fluid extract. α -amylase and α -glucosidase inhibitory activities for EtOHconv at 1 mg/mL were 30.08 % (± 5.23) and 38.29 % (± 2.52), whereas for standard acarbose it was 28.24 % (± 13.66) and 36.93 % (± 2.70), respectively. Supercritical fluid extract showed less potent in vitro antioxidant and digestive enzymes inhibitory effects (15.67 \pm 4.03- α -amylase, 28.36 \pm 2.01- α -glucosidase). GC Q-TOF MS analysis was done to confirm the presence of bioactive compounds in both the extracts. Although EtOHconv showed better results, SFE was found to contain more bioactive compounds associated with various pharmacological effects especially antioxidative as per GC Q-TOF MS results. SFE being a clean and green technology could be employed in future with more focus on method development and optimization to reproduce better and safe bioactive products from the neglected weed *M. pudica*. © 2017, National Institute of Science Communication and Information Resources (NISCAIR). All Rights Reserved.

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