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Phytochemical profile, antimicrobial, antioxidant and antiobesity activities of *Scolymus angiospermus* Gaertn. Four fractions from Jericho/Palestine

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Abstract

Many recent studies have shown that medicinal plants, which have been used worldwide through the past history in the folkloric medicine, harbor a significant number of novel metabolic compounds with potent pharmacological properties. In several countries, the aerial parts of the *Scolymus angiospermus* plant have been used as a food supply and as a folkloric medicinal plant. The current study aimed is to investigate the antimicrobial, antilipase, antioxidant activities and phytochemical profile of methanolic, hexane, aqueous and ethyl acetate fractions obtained from the aerial parts of *S. angiospermus*. Phytochemical assessments were based on standard analytical methods. The obtained fractions were evaluated for their antioxidant capacity and their antilipase activity using 2,2-diphenyl-1-picrylhydrazyl and porcine pancreatic lipase inhibitory tests, respectively. Antimicrobial activity of the obtained fractions was evaluated using broth microdilution assay against several American Type Culture Collection bacterial and fungal strains and Methicillin-Resistant *Staphylococcus aureus* clinical isolate. Our data showed that of all obtained fractions used in the above-mentioned assays, both of methanolic and aqueous fractions, had the highest content of flavonoids (24.93 ± 2.11 and 12.21 ± 2.11 mg QUE/g, respectively) and phenolic compounds (96.28 ± 2.87 and 91.25 ± 2.63 mg of GAEq/g, respectively) as well as the best levels of both antioxidant (half maximal inhibitory concentration (IC₅₀) 13.67 ± 1.44 and 14.69 ± 1.97 μ g/ml, respectively) and antilipase (IC₅₀ 134.89 ± 1.65 and 269.15 ± 2.33 μ g/ml, respectively) activities. In addition, these fractions exhibited various levels of both antibacterial and antifungal activities. Hydrophilic fractions were more potent against the investigated bacterial strains, while hydrophobic fractions were more potent against the investigated fungal strains. The hydrophilic fractions derived from *S. angiospermus* have shown the best antioxidant and antilipase effects. This is may be due to the high contents of phenols and/or flavonoids. However, further investigations are essential to isolate and identify the antioxidant, antilipase and antimicrobial compounds. Our data provide significant evidence that *S. angiospermus* can be very useful in the prevention and treatment of various infectious and non-infectious chronic diseases and as natural food preservatives. © 2018 Walter de Gruyter GmbH, Berlin/Boston.

Author Keywords

antilipase; antimicrobial; antioxidant; flavonoid; *Scolymus angiospermus*; total phenols

Index Keywords

acetic acid ethyl ester, alkaloid, amino acid, antifungal agent, antiinfective agent, antiobesity agent, antioxidant, cardiac glycoside, essential oil, flavonoid, gallic acid, hexane, methanol, phenol derivative, phytosterol, plant extract, quercetin, saponin, *Scolymus angiospermus* extract, starch, tannin derivative, tetrahydrolipstatin, triacylglycerol lipase, trolox C, unclassified drug; antibacterial activity, antifungal activity, antioxidant activity, aqueous solution, Article, bacterium isolate, *Candida albicans*, controlled study, drug potency, drug screening, enzyme inhibition, *Epidermophyton floccosum*, *Escherichia coli*, hydrophilicity, hydrophobicity, IC₅₀, methicillin resistant *Staphylococcus aureus*, minimum inhibitory concentration, nonhuman, phytochemistry, *Pseudomonas aeruginosa*, *Scolymus*, *Scolymus angiospermus*, *Staphylococcus aureus*

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