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Abstract

Phenolic Compounds and Bioactive Properties of *Clematis cirrhosa* L. (Ranunculaceae): The Pharmacological Potential of an Underexploited Herb †

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Abstract: *Clematis cirrhosa* L. is an Algerian medicinal specie used to treat burns, joint aches, rheumatism pain and sexual dysfunction and as a diuretic agent [1–4], yet there is little information available concerning its bioactive composition and its potential economic value has not been explored. The aim of this study was to quantify bioactive compounds and to investigate antioxidant and acetylcholinesterase inhibitory activities of extracts obtained from the whole plant of *C. cirrhosa* in order to prove its possible use as potential natural source for human health. Phenolic compounds were distinctively profiled in the different extracts using TLC and standard phenolics. The antioxidant activity was evaluated by the 1,1-diphenyl-2-picrylhydrazyl (DPPH), 2,2'-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid (ABTS), *N*,*N*-dimethyl-*p*-phenylenediamine (DMPD), nitric, hydroxyl and superoxide radicals, β-carotene bleaching, cupric reducing, ferric reducing, and metal chelating activity methods. Maceration in ethyl acetate and methanol allowed recovering the highest cumulative phenolic (96.13 and 99.98 mg GAE/g DE, respectively), flavonoid (44.90 and 24.62 mg CE/g DE, respectively), flavonol (16.05 and 22.13 mg QE/g DE, respectively), and hydrolyzable (585.21 and 85.54 mg TAE/g DE, respectively) and condensed tannin (3.15 and 6.23 mg CE/g DE, respectively) contents. The phytochemical analysis led to the identification of several phenolic compounds that were dominated by chrysophanol, emodin, caffeic acid, chlorogenic acid and kaempferol-3,7-*O*-dirhamnoside. The ethyl acetate and methanol extracts showed potential antioxidant activity in the different assays and this could be attributed to their polyphenol, tannin, and flavonoid contents. The ethyl acetate and methanol extracts exhibited also anti-acetylcholinesterase activity (IC_{50} values of 1.12 and 0.71 mg/mL, respectively). This study provided a fundamental reference for the research of polyphenols in *C. cirrhosa* and found that this plant has the promising prospects of additives used in food.

Keywords: medicinal plants; phenolic compounds; flavonoids; oxidative stress; neuroprotection; food applications

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