HPLC-DAD-ESI/MS phenolic characterization and biological activity of *Equisetum giganteum* L.

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Naturally-occurring phytochemicals have received a pivotal attention in the last years, due to the increasing evidences of biological activities. *Equisetum giganteum* L., commonly known as "giant horsetail", is a native plant from Central and South America, being largely used in dietary supplements as diuretic, hemostatic, anti-inflammatory and anti-rheumatic agents [1,2]. The aim of the present study was to evaluate the antioxidant (scavenging effects on 2,2-diphenyl-1-picrylhydrazyl radicals- RSA, reducing power- RP, β-carotene bleaching inhibition- CBI and lipid peroxidation inhibition- LPI), anti-inflammatory (inhibition of NO production in lipopolysaccharide-stimulated RAW 264.7 macrophages) and cytotoxic (in a panel of four human tumor cell lines: MCF-7- breast adenocarcinoma, NCI-H460- non-small cell lung cancer, HeLa- cervical carcinoma and HepG2- hepatocellular carcinoma; and in non-tumor porcine liver primary cells- PLP2) properties of *E. giganteum,* providing a phytochemical characterization of its extract (ethanol/water, 80:20, *v/v*), by using high-performance liquid chromatography coupled to diode array detection and electrospray ionisation mass spectrometry (HPLC-DAD–ESI/MS).

E. giganteum presented fourteen phenolic compounds, two phenolic acids and twelve flavonol glycoside derivatives, mainly kaempferol derivatives, accounting to 81% of the total phenolic content, being kaempferol-*O*-glucoside-*O*-rutinoside, the most abundant molecule (7.6 mg/g extract). The extract exhibited antioxidant (EC_{50} values = 123, 136, 202 and 57.4 μg/mL for RSA, RP, CBI and LPI, respectively), anti-inflammatory (EC_{50} value = 239 μg/mL) and cytotoxic (GI_{50} values = 250, 258, 268 and 239 μg/mL for MCF-7, NCI-H460, HeLa and HepG2, respectively) properties, which were positively correlated with its concentration in phenolic compounds. Furthermore, up to 400 μg/mL, it did not revealed toxicity in non-tumor liver cells.

Thus, this study highlights the potential of *E. giganteum* extracts as rich sources of phenolic compounds that can be used in the food, pharmaceutical and cosmetic fields.

Keywords: Equisetum giganteum; antioxidant activity; anti-inflammatory activity; cytotoxic properties; phenolic compounds.

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Pour le comité d'organisation
Professeur Lotfi ACHOUR