ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF *CYTISUS MULTIFLORUS*

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INTRODUCTION

Many traditional medicinal plants are potential candidates for finding new therapeutic and supplementary health products. *Cytisus multiflorus*, (White Spanish Broom), is used in folk medicine in the Iberian Peninsula, where it is claimed to have various health benefits, including diuretic, hypnotic, anxiolytic, antiparasitic, antidiabetic, antioxidant and anti-inflammatory properties[1]. The usage of this plant is however, totally based on the available ethnopharmacological information, as no scientific data regarding its biological effects has been delivered. In this sense, is the aim of this work to contribute to the scientific knowledge of the antioxidant and anti-inflammatory properties of *C. multiflorus*.

Fig. 1- *Cytisus multiflorus*

METHODS

The ethanolic extract from flowers of *C. multiflorus* was prepared by extraction with an 80% ethanolic solution (*v/v*), as previously described[1]. The total phenolic content of the extract was determined following the Folin-Ciocalteu procedure and the main phenolic constituents were identified and quantified by combined HPLC-DAD and ESI-MS^n analysis[1]. The antioxidant abilities of the *C. multiflorus* extract were evaluated through the DPPH scavenging[2] and reducing power[3] assays. The assessment of cell viability in the presence of distinct concentrations of the extract was performed by the MTT reduction colorimetric assay[4] and the anti-inflammatory activity of a non-toxic extract concentration was acceded by its nitric oxide inhibition ability, as measured by the Griess assay, on lipopolysaccharide-stimulated Raw 264.7 macrophages.

RESULTS AND DISCUSSION

Tab.1- Phenolic content and antioxidant activity of *C. multiflorus* ethanolic extract

Mass (%)	[a] Total phenolic (mg GAE/g)	[b] DPPH (EC_{50}) (µg/ml)	[c] Reducing Power (EC_{50}) (µg/ml)
22.96%	140.39 ± 11.67	13.4 ± 1.0	11.4 ± 2.1

Mean Values ± standard derivations of three replicate analyses

[a] Data expressed as milligrams of gallic acid equivalents (GAE) per gram of extract; [b] EC_{50} – concentration for a 50 % inhibitionof the 60 µM radical 2,2-diphenyl-1-picrylhydrazyl (DPPH); [c] Amount of extract able to providing 0.5 of absorbance by reducing of 3.5 µM Fe^{3+} to Fe^{2+};

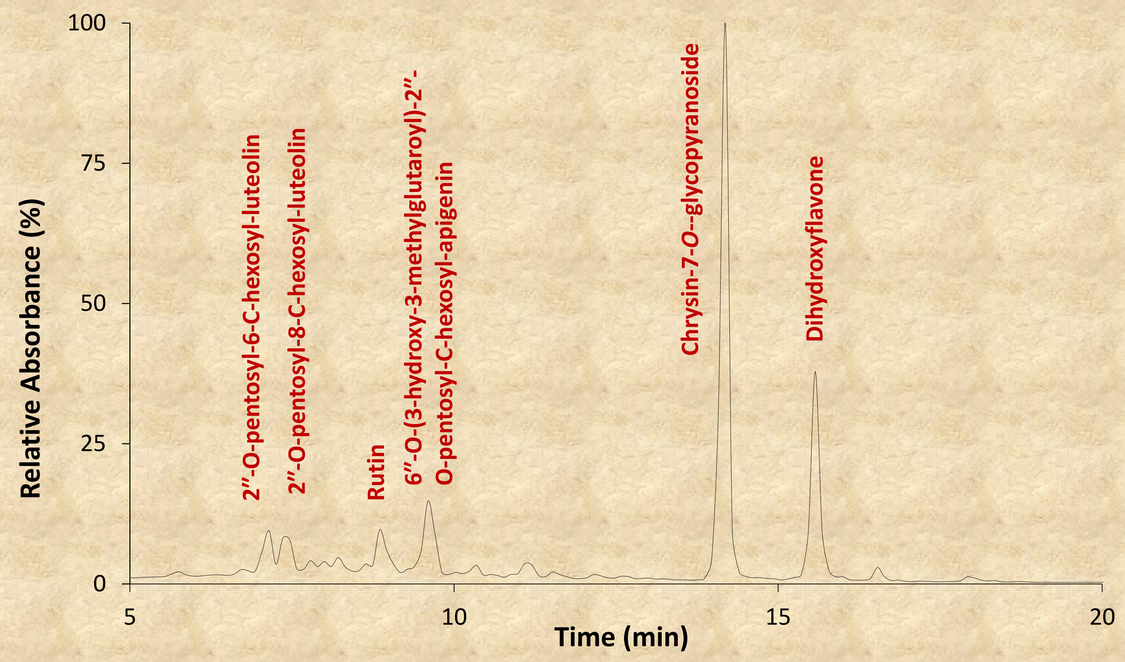

Fig.2- Chromatographic profile of the *C. multiflorus* ethanolic extract at 280 nm

Tab.2- Effect of C. *multiflorus* ethanolic extracts in HepG2 viability

Condition	Cell Viability (%)
Control	100
LPS (1µg/mL)	82.25 ± 1.14
C. multiflorus (325 µg/mL)	90.67 ± 14
C. multiflorus (325 µg(mL) + LPS (1µg/mL)	86.93 ± 4.1
C. multiflorus (161 µg/mL)	104.78 ± 4.1
C. multiflorus (161 µg/mL) + LPS (1µg/mL)	94.01 ± 13

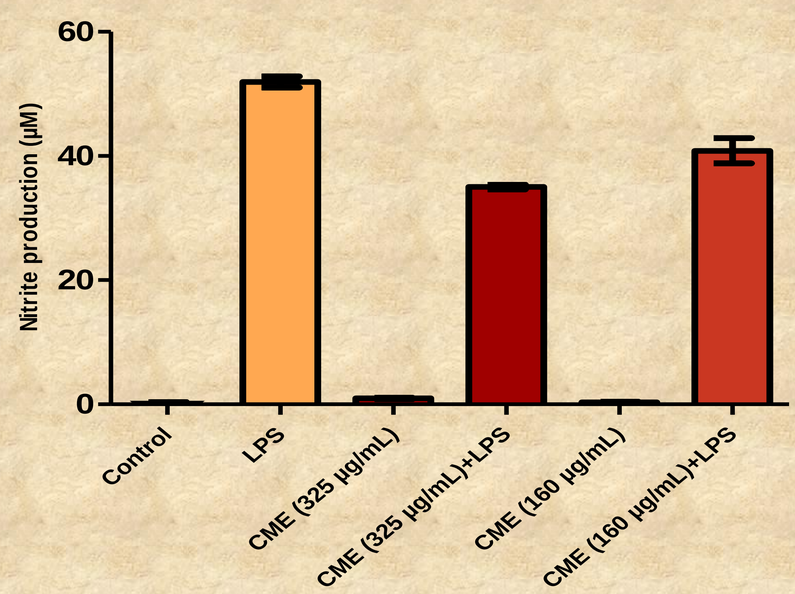

Fig.3- Effect of *C. multiflorus* extract (CME) in the nitrite production of macrophages stimulated with LPS 1 µg/mL

The main phenolic constituents of C. multiflorus were chrysin-7-*O*- glycopyranoside and a dihydroxyflavone isomer of chrysin, which accounted for 49.4±7.3 mg/g and 21.8±3.8 mg/g, respectively. As indicated by its low EC_{50} values (13.4±1.0 and 11.4±2.1 µg/mL for DPPH scavenging potential and reducing power, respectively), the *C. multiflorus* ethanolic extract has a high antioxidant capacity. Moreover, the extract did not cause cytotoxicity against RAW 264.7 macrophages for concentrations up to 325 µg/mL and the treatment of this cell line with 160,8 µg/ml and 325 µg/ml of the extract induced a decrease in the levels of NO of 23.9 and 32.1%, respectively.

CONCLUSION

The gathered data suggests that *C. multiflorus* is in fact a good antioxidant and anti-inflammatory plant, as believed by the folk knowledge.

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