Cytisus multiflorus: source of antioxidant polyphenols

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INTRODUCTION

Cytisus multiflorus is an endemic shrub of the western Iberian Peninsula that are consumed as tea infusions due to its beneficial effects [1]. The therapeutic properties have been associated to the antioxidant properties of its polyphenols [2]. However, the phenolic characterization of this plant species is poorly studied and there are few scientific works supporting its ethnopharmacological uses.

In this sense, this study focus on the phenolic composition of *C. multiflorus*, as well as on the evaluation of the antioxidant ability of the polyphenols present in this plant.

METHODS

Preparation of plant extract and phenolic composition determination

The ethanolic extract from flowers of *C. multiflorus* was prepared by extraction with an 80% ethanolic solution (*v/v*), as previously described [3]. The phenolic compounds of the extract were separated by means of HPLC-DAD and identified by ESI-MS and MS^n analyses [3]. The major flavone was identify by NMR. The quantification of individual polyphenols was performed at 280 nm by HPLC-DAD using the external standard method.

Antioxidant activity

The antioxidant properties of the *C. multiflorus* ethanolic extract were evaluated through the chemical models of 2,2-diphenyl-1-picrylhydrazyl radical ($DPPH^{\bullet}$) scavenging potential [4] and reducing power [5], as well as on human hepatoblastoma HepG2 cell cultures, through monitoring by flow cytometry of the protective effects against the production of reactive oxygen species (ROS), as induced by potassium dichromate (5 and 25 µM) [6]. ROS measurements were also performed with a mixture of the apigenin, chrysin, luteolin, quercetin, in order to resemble their levels in the the *C. multiflorus* ethanolic extract.

RESULTS AND DISCUSSION

Phenolic Characterization

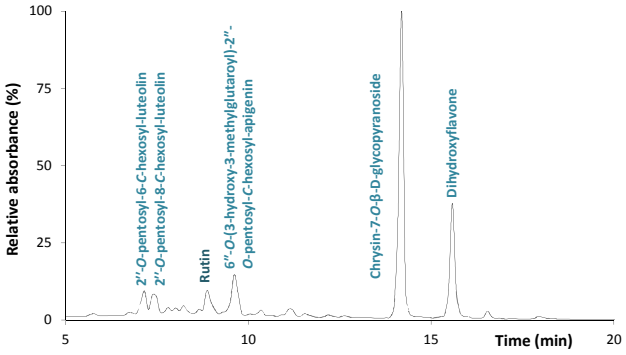

Fig. 1. Chromatographic profile of the *C. multiflorus* ethanolic extract at 280 nm

⇨ Chrysin-7-*O*-β-D-glycopyranoside was the major phenolic compound in the *C. multiflorus* ethanolic extract (49.4 ± 7.3 mg/g extract). This also contained considerable amounts of a dihydroxyflavone isomer of chrysin (21.8 ± 3.8 mg/g extract) and rutin (14.1 ± 1.7 mg/g extract).

Antioxidant Capacity

Table 1- Antioxidant capacity of *C. multiflorus* ethanolic extract

Radical Scavenging (µg/mL)[1]	Reducing Power (µg/mL)[1]
13.4 ± 1.0	95.7 ± 4.6

[1]Expressed as EC_{50}

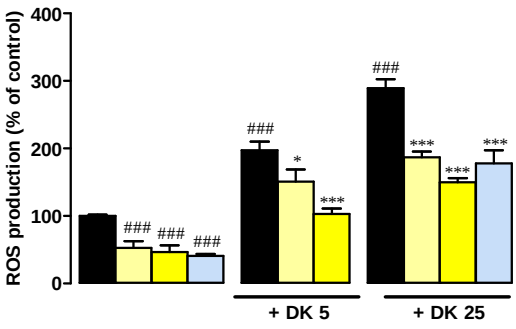

Fig. 2. Effect in ROS production induced by potassium dichromate at 5 and 25 µM of in human hepatoblastoma HepG2 cells treated during 48 h with *C. multiflorus* ethanolic extract at 50 µg/mL (■), *C. multiflorus* ethanolic extract at 200 µg/mL (■)or the mixture of phenolic standards (■) comparing to control (■)

CONCLUSION

***C. multiflorus* ethanolic extract exhibited good antioxidant capacity both in chemical and in cellular models. The phenolic components of the extract contributed for this ability.**

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