Natural Products and related Redox Catalysts: Basic Research and Applications in Medicine and Agriculture

Aveiro, November 25-27, 2012
Is *Cytisus multiflorus* an anti-inflammatory plant?

Susana C. Saraiva, a Olívia R. Pereira, a,b Joana Liberal, d,e Maria T. Batista, c,d Maria T. Cruz, c,e Susana M. Cardoso a

a CERNAS, Escola Superior Agrária de Coimbra, Instituto Politécnico de Coimbra, Coimbra, Portugal; 
b Departamento de Tecnologias de Diagnóstico e Terapêutica, Escola Superior de Saúde, Instituto Politécnico de Bragança, Bragança, Portugal; c Faculdade de Farmácia, Universidade de Coimbra, Azinhaga de Santa Comba, 3000-548 Coimbra, Portugal; d Centro de Estudos Farmacêuticos, Azinhaga de santa Comba, 3000-548 Coimbra, Portugal; e Centro de Neurociências e Biologia Celular, Departamento de Zoologia da Universidade de Coimbra, 3004-517 Coimbra, Portugal

*Cytisus multiflorus* is a leguminous shrub native from Iberian Peninsula that is distributed in the south-west Mediterranean region. This plant is used in folk medicine and it is claimed to have various health benefits, including anti-inflammatory properties. [1] Yet, the anti-inflammatory usage of *C. multiflorus* is totally based on the available ethnopharmacological information while no scientific data on this capacity and on molecular targets has been reported for the plant. Hence, the present work aims to clarify the possible anti-inflammatory mechanisms of *C. multiflorus*.

A purified ethanolic extract was prepared and its high antioxidant capacity was confirmed though the DPPH radical scavenging [2] and reducing power [3] assays (EC50 values 13.4±1.0 and 11.4±2.1 μg/mL, respectively). Moreover, anti-inflammatory properties of the *C. multiflorus* extract were tested on a lipopolysaccharide-stimulated Raw 264.7 macrophages model. In order to accomplish that, nitric oxide (NO) production, scavenging activity and cytotoxicity of the extract were assessed. Furthermore, the effects on two proteins that are potential targets to prevent or treat chronic inflammation, namely cyclooxygenase-2 (COX-2) and inducible NO synthase (iNOS), were estimated by Western Blot analysis.

The obtained results showed that *C. multiflorus* extract was able to significantly inhibit the production of NO for non-toxic concentrations. The treatment of this cell line with 161 μg/ml and 325 μg/ml of the purified extract induced a decrease in the levels of NO of 24% and 32%, respectively. Furthermore, despite no changes on COX-2 levels were observed, iNOS expression was significantly diminished by the treatment with the highest concentration of the extract.

Overall, the present results suggest that *C. multiflorus* actually exerts an anti-inflammatory action which is, at least partially, mediated through the inhibition of iNOS expression.

Acknowledgments: The authors acknowledge the financial support provided by the FCT to CERNAS (project PEst-OE/AGR/UI0681/CNC/CEF/2011). Olívia R. Pereira was supported by a PhD grant (SFRH/PROTEC/49600/2009).

References