



Universitat
de les Illes Balears



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Centro de Investigación Biomédica en Red
Fisiopatología de la Obesidad y Nutrición

«Towards a *Redox Healthy Aging*»

WGs Meeting of the NutRedOx COST Action CA16112

15th – 16th February 2018

Palma, Mallorca





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Sponsors: COST Action CA16112; Directorate General of Research, Development and Innovation of the Balearic Islands Government; University of the Balearic Islands; CIBEROBN.

OC11 - Protective effect of *Centaurium erythraea* methanol extract against oxidative challenge in red blood cells of diabetic rats

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In light of increasing prevalence of diabetes over the past few decades and increasing lifespan of human population, there is a need to better monitor the quality of life of diabetic patients. Epidemiological evidence shows protective effect of regular consumption of diets rich in plant polyphenols against development of diabetes. *Centaurium erythraea* Rafn (CE) is traditionally used in Serbia for diabetes treatment. Previous phytochemical studies with aerial parts of CE showed it can substantially alleviate oxidative stress, one of the major pathogenic factors that lead to diabetes and its complications. Chronic hyperglycemia, the hallmark of diabetes, leads to increased production of free radicals which affect red blood cells (RBCs) structure and function. Considering RBCs role as oxygen transporters and consequences of impaired oxygen delivery in diabetes, the main goal of this research was to evaluate the protective effect of the methanol extract of aerial parts of CE against oxidative challenge in RBCs of rats with streptozotocin (STZ)-induced diabetes. The CE extract (100 mg/kg) was given daily and orally two weeks before, during diabetes induction (i.p. injection of STZ (40 mg/kg) for five consecutive days), and for four weeks after the STZ injections (animals designated as pre-treated group), or for four weeks after diabetes induction (post-treated group). Daily application of CE extract to STZ-induced diabetic rats improved the redox status of RBCs, observed as reduced lipid peroxidation and alleviated oxidative damage due to improved glutathione system and antioxidant enzyme activity, such as catalase (CAT), superoxide dismutase (SOD) and glutathione reductase (GR). Ameliorated RBCs' redox status was accompanied with improvement of major biochemical indicators of diabetes. CE extract increased serum insulin level, reduced blood glucose and glycated hemoglobin concentrations and improved lipid profile of diabetic rats. Furthermore, the CE extract reduced non-enzymatic glycation and enzymatic glycosylation and improved parameters which correlate with RBC aggregation and deformability. The protective effect of CE extract was more pronounced in pre-treated diabetic group. According to these results, *Centaurium erythraea* methanol extract has a great potential for use as dietary supplement in diabetes management. Since plenty of bioactive compounds, including polyphenols were determined in CE extract, identification of active metabolites from CE and their tissue distribution after intake could provide a useful source of potential novel antidiabetic pharmaceutical entities.

Keywords: *Centaurium erythraea*, diabetes, oxidative stress, red blood cells, antioxidant



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CERTIFICATE OF PRESENTATION

I hereby certify that the communication entitled :

OC11- Protective effect of Centaurium erythraea methanol extract against oxidative challenge in red blood cells of diabetic rats

has been presented by the author/s

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at the WGs Meeting of the NutRedOx COST Action CA16112 «Towards a *Redox Healthy Aging*» from the 15th to the 16th of February, 2018

Palma, Mallorca, Spain, 26th of February, 2018

Prof. Josep A. Tur

Chair of the Organizing Committee

