

Investigation of the Possible Beneficial and Protective Effects of an Ethanolic Extract from *Sarcopoterium spinosum* Fruits

Authors : Hawraa Zbeeb, Hala Khalifeh, Mohamad Khalil, Francesca Storace, Francesca Baldini, Giulio Lupidi, Laura Vergani

Abstract : *Sarcopoterium spinosum*, a widely distributed spiny shrub belonging to the Rosaceae family, is rich in essential and beneficial constituents. In fact, *S. spinosum* fruits and roots are traditionally used as herbal medicine in the eastern Mediterranean landscape, and this shrub is mentioned as a medicinal plant in a large number of ethnobotanical surveys. Aqueous root extracts from *S. spinosum* are used by traditional medicinal practitioners for weight loss treatment of diabetes and pain. Moreover, the anti-diabetic activity of *S. spinosum* root extract has been reported in different studies, but the beneficial effects of aerial parts, especially fruits, have not been elucidated yet. The aim of the present study was to investigate the in vitro antioxidant and lipid-lowering properties of an ethanolic extract from *S. spinosum* fruits using both hepatic (FaO) and endothelial (HECV) cells in an attempt to evaluate its possible employment as a nutraceutical supplement. First of all, in vitro spectrophotometric assays were employed to characterize the extract. The total phenol content (TPC) was evaluated by Folin-Ciocalteu spectrophotometric method and the radical scavenging activity was tested by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2, 2'-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS) assays. After that, the beneficial effects of the extract were tested on cells. FaO cells treated for 3 hours with 0.75 mM oleate/palmitate mix (1:2 molar ratio) mimic in vitro a moderate hepato-steatosis. HECV cells exposed for 1 hour to 100 μ M H₂O₂ mimic an oxidative insult leading to oxidative stress conditions. After the metabolic and oxidative insult, both cell lines were treated with increasing concentrations of the *S. spinosum* extract (1, 10, 25 μ g/mL) for 24 hours. The results showed the *S. spinosum* ethanolic extract is rather rich in phenols (TPC of 18.6 mgGAE/g dry extracts). Moreover, the extract showed a good scavenging ability in vitro (IC₅₀ 15.9 μ g/ml and 10.9 μ g/ml measured by DPPH and ABTS assays, respectively). When the extract was tested on cells, the results showed that it could ameliorate some markers of cell dysfunction. The three concentrations of the extract led to a significant decrease in the intracellular triglyceride (TG) content in steatotic FaO cells measured by spectrophotometric assay. On the other hand, HECV cells treated with increasing concentrations of the extract did not result in a significant decrease in both lipid peroxidation measured by the Thiobarbituric Acid Reactive Substances (TBARS) assay, and in reactive oxygen species (ROS) production measured by fluorometric analysis after DCF staining. Interestingly, the ethanolic extract was able to accelerate the wound repair of confluent HECV cells with respect to H₂O₂-insulted cells as measured by T-scratch assay. Taken together, these results seem to indicate that the ethanol extract from *S. spinosum* fruits is rich in phenol compounds and plays considerable lipid-lowering activity in vitro on steatotic hepatocytes and accelerates wound healing repair on endothelial cells. In light of that, the ethanolic extract from *S. spinosum* fruits could be a potential candidate for nutraceutical applications.

Keywords : antioxidant activity, ethanolic extract, lipid-lowering activity, phenolic compounds, *Sarcopoterium spinosum* fruits

Conference Title : ICNFFF 2021 : International Conference on Nutrition, Nutraceuticals and Functional Foods

Conference Location : Vienna, Austria

Conference Dates : December 27-28, 2021