

Antioxidant activities of extracts obtained from two wild Algerian medicinal drugs: *Rhamnus alaternus* L. stem bark and *Retama sphaerocarpa* L. fruits

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Some medicinal and spice plants are known for their pharmacological activity, and contain many polyphenolic substances that exhibit radical scavenging properties and possess health properties associated with anti-cancer, anti-allergic and anti-inflammatory activities.

Algerian flora, the most diverse in the world, has become an interesting spot to prospect for new chemical leads or hits due to its species diversity. Algeria includes wide areas of desert and tropical regions which support the growing of wild plants resistant for those hard conditions. Therefore, these plants might contain different secondary metabolites with high biological significance which can be used for treatment of different diseases (Aboul-Enein *et al.*, 2012).

Retama sphaerocarpa (L.) Boissier (Fabaceae) is a perennial shrub widespread in the Iberian Peninsula and northwest Africa. The aerial parts are traditionally used as an emmenagogue and abortifacient and are also used in the treatment of warts and constipation (López-Lázaro *et al.*, 1999). *Rhamnus alaternus* L., generally known as Mediterranean buckthorn, is a perennial shrub or tree (up to 5 m tall) of the family Rhamnaceae, typical of the Mediterranean area (Longo *et al.*, 2005). It has been traditionally used as a digestive, diuretic, laxative, hypotensive and for the treatment of hepatic and dermatological complications.

In this study we determined the antioxidant/free radical scavenger properties of different extracts (aqueous and methanolic) of *R. alaternus* stem bark and *R. sphaerocarpa* fruits. In particular our goal was to compare the antioxidant activity of an aqueous extract obtained by decoction according to the method used in Algerian traditional medicine and methanolic or aqueous extracts obtained by maceration. At this aim five different simple redox-based assays (all involving one redox reaction with the oxidant) were used: the Folin-Ciocalteu assay; the bleaching of the stable 1,1-diphenyl-2-picrylhydrazyl radical (DPPH[•]); the trolox equivalent antioxidant capacity (TEAC) assay; the ferric reducing/antioxidant power (FRAP) assay; the oxygen radical absorbance capacity (ORAC) assay. Moreover, the *Artemia salina* (brine shrimp) lethality bioassay was employed to evaluate the potential cytotoxic activity of the extracts. The polyphenols composition of *R. alaternus* stem bark and *R. sphaerocarpa* fruit extracts was determined by means of HPLC-DADESI-MS analysis.

All the extracts tested showed a good antioxidant/free radical scavenger activity. However the lowest activity was observed for the aqueous extracts obtained by maceration from *R. alaternus* and *R. sphaerocarpa*. Besides, interestingly the aqueous extract obtained by decoction showed an antioxidant activity similar to that of the methanol extract obtained by maceration. These properties are very likely related to the chemical composition (in particular the polyphenolic content) of the *R. alaternus* and *R. sphaerocarpa* extracts under investigation. In fact the analysis showed that both in aqueous decoctions and methanolic extracts flavonoids and hydroxycinnamic acids are present. In particular the most representative compounds were genistein-glucosides and daidzein derivatives in *R. sphaerocarpa* extracts; as to *R. alaternus* extracts kaempferol-glucoside and rhamnetin-glucoside were the most abundant components. Toxicity test on brine shrimps showed no toxic effect at concentrations up to 1mg/ml.

These results confirmed that decoction, usually employed in traditional medicine, of Algerian *R. sphaerocarpa* and *R. alaternus* can be regarded as a source of very efficient antioxidant compounds, and moreover this activity could explain their therapeutic and preventive usefulness.

References:

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