

Comparative studies on antioxidant activity of extracts from three wild *Rosa* species grown in different Tunisia regions

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The genus *Rosa* is one of the most widespread members of Rosaceae family and grows throughout the temperate and subtropical regions of the northern hemisphere. In particular, *Rosa canina* L., *Rosa sempervirens* L. and *Rosa moschata* Herrm. grow in the wild in various Tunisia regions (especially in Northwest). *Rosa canina* L. [1] is a spiny shrub and produces fragrant pink or white flowers and fleshy red fruits. Besides to be used as an ornamental plant, *R. canina* is frequently employed in traditional medicine. In fact dog roses are known in literature for their prophylactic and therapeutic activities against a wide range of ailments, including infectious diseases, inflammatory and gastro-intestinal disorders. In particular dog rose hips, roots and leaves are known as diuretic, anti-inflammatory, anti-allergic and antioxidant agents and they have been used against bronchitis [2]. Other two *Rosa* species are widely used as floral fragrance in cosmetic and aromatherapy: *R. sempervirens*, a shrub with white flowers and fleshy fruits, and *R. moschata* Herrm., a shrub with white musk-scented flowers; however little is known about their potential application for health purposes.

The aim of this work was to characterize and compare the antioxidant properties of organic (methanol, ethyl acetate, hexan) extracts from leaves and stems of three different species of *Rosa* (*R. canina*, *R. sempervirens* and *R. moschata*) collected from diverse Tunisia regions characterized by different geographic and pedo-climatic conditions. In particular we wanted to underline the potential inter-species differences in the antioxidant properties of extracts obtained from these three *Rosa* species, like also the intra-species differences related to the different geographical origin and to the different plant parts. At this aim we used four different simple redox-based assays (all involving one redox reaction with the oxidant): 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.

All methanolic and ethyl acetate extracts, but not the hexan extracts, showed good antioxidant/free radical scavenger activity, and a positive correlation between the antioxidant capacity of the extracts under study and their content of phenols and flavonoids was found.

The assays revealed that the antioxidant properties of *R. moschata* and *R. sempervirens* extracts are comparable those of *R. canina* extracts. Conversely, for each species substantial differences in polyphenol content and antioxidant activity were found among samples collected from different regions, due very likely to the influence of the geographically-dependent environmental conditions.

Taken together the data suggest that extracts not only from *Rosa canina* but also from *R. moschata* and *sempervirens* might be valuable sources of natural antioxidants. Above all *R. sempervirens* and *moschata* could be used as a good alternative to *R. canina* especially in those regions where these species can be easily found.

1. V. Wissemann et al. (2007) Pl. Syst. Evol. 266: 79-89.

2. D. D. Orhan et al. (2007) J. Pharmacol. 112: 394-400.