

POSIDONIA OCEANICA (L.) DELILE: ANTIOXIDANT ACTIVITY AND NUTRACEUTICAL CONTENT

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Introduction: *Posidonia oceanica* (L.) Delile (*P. oceanica*) is an endemic aquatic plant of the Mediterranean Sea, incorrectly known as an alga. It builds thick meadows, from 1 to 40 meters deep and green leaves, which may reach 1 meter in height. It is an important habitat for fisheries and play role in monitoring of pollutants herbicides, pesticides and other chemical contaminants. The plant has been used since ancient times and some uses in traditional medicine were confirmed as well as antibacterial and antifungal. In the search for a sustainable livestock system that balances natural resources and economic benefits, considerable efforts have been made to find new sources such as marine plants. The aim of this study is to evaluate the antioxidant capacity and nutraceutical content expressed as total polyphenols, rutin, quercetin in leaves extracts of *P. oceanica*.

Materials and methods: Several samples of leaves of *P. oceanica* has been harvested in sea of Sicily (Egadi Islands Marine Protected Area) in three different period of years (April, July and September). The leaves were exsiccated at 30°C for 14 days and successively extracted with 15% aqueous ethyl alcohol (10g in 100ml) at 25°C for 72 hours. The ethyl alcohol was removed under vacuum. The extracts were investigated for the antioxidant activity by 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging and Ferric reducing antioxidant power (FRAP) assays. The levels of flavonoids (quercetin and rutin) were measured by HPLC method. The total polyphenols contents of the extracts was estimated with spectrophotometric method.

Results: The results obtained demonstrated that extracts of *P. oceanica* harvested in September showed a higher DPPH inhibition ($IC_{50} 0.23 \pm 0.012$ mg/g) compared to extracts of the plant harvested at April or July ($P < 0.001$ and $P < 0.01$ respectively). Similarly the samples harvested in September showed high antioxidant power, evaluated by FRAP test (1.307 ± 0.057 mmol Fe^{2+} equivalent per gram), significantly different versus the leaves harvested in April ($P < 0.05$). In addition all extracts showed high levels of polyphenols (20.21 ± 0.899 GAE mg/g in April; 84.50 ± 3.009 GAE mg/g in July and 94.15 ± 1.190 mg/g in September). The quercetin concentration in samples was low (0.21 ± 0.015 μ g/ml in April; 0.22 ± 0.009 μ g/ml in July and 0.23 ± 0.005 μ g/ml in September) and not significant difference were observed in the different time of harvested, otherwise the rutin was higher (2.53 ± 0.758 μ g/ml in April; 6.54 ± 0.958 μ g/ml in July and 6.97 ± 1.64 μ g/ml in September) with a significant increase in July and September ($p < 0.01$).

Discussion: In this study we evaluated the nutraceutical content and the antioxidant activity of *P. oceanica* leaves extracts. The antioxidant activity of plants is mainly contributed by the active compounds as polyphenols and flavonoids quercetin and rutin when ethanol 15% is used as solvent. The leaves of *P. oceanica* resulting in a peculiar phytocomplex endowed with interesting biological properties. The study shows that there are differences in the contents of nutraceutical based on different harvesting time.

Conclusion: The results obtained suggested that *P. oceanica* may be used for many industrial products and thanks to its nutraceutical content and its antioxidant activity it could represent a sustainable and low-cost perspective in the field of animal nutrition.