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Comparative evaluation of antioxidant activity in two coastal dune plants from Vila do Conde (Portugal): Preliminary data

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Abstract

Background: Coastal dune systems host a diversity of plant species adapted to harsh environmental conditions, such as high solar radiation, nutrient-poor soils, and limited water availability. These constraints lead to specific ecological requirements, allowing the establishment of characteristic vegetation zones. Environmental conditions not only influence plant distribution but also modulate their phytochemical composition [1]. Therefore, studying their chemical and biological profiles is essential to explore potential pharmacological applications and support traditional uses [2]. **Objective:** This study aimed to evaluate the antioxidant activity of aqueous extracts from two costal plant species, *Medicago marina* and *Otanthus maritimus*, collected from sand dunes of Vila do Conde (Portugal). **Methods:** For both samples, plant material was collected and oven-dried at 40 ºC. Leaves were ground with a blender into a fine powder and subjected to aqueous extraction using two different procedures: extraction at 50 ºC (for 60 min) and extraction under boiling conditions (for 10 min), followed by filtration and liofilization. The dried extracts were reconstituted in water and the antioxidant activity was evaluated using the DPPH radical scavenging assay by measuring their ability to neutralize free radicals at different extracts concentrations and duplicate [3]. **Results:** At a concentration of 1000 µg/mL, *Medicago marina* exhibited relatively low inhibition percentages, with no differences observed between the extract obtained at 50ºC (4.89%) and by boiling (4.95%). In contrast, *Otanthus maritimus* showed a higher inhibition percentage, with a further enhancement in radical scavenging capacity observed in the extract obtained by boiling (50 ºC = 23.64%; boiling = 37.85%). Both species demonstrated antioxidant activity in a concentration-dependent manner, with *Otanthus maritimus* consistently exhibiting greater radical scavenging capacity than *Medicago marina.* **Conclusions:** The findings indicate that *Medicago marina* and, especially, *Otanthus maritimus* are promising sources of natural antioxidants. Further phytochemical characterization and biological studies are recommended to explore their potential pharmacological applications and support traditional uses.

Keywords: dune plants, antioxidant activity, coastal ecosystems

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