STUDY OF ANTIOXIDANT ACTIVITY IN EXTRACTS FROM FRESH AND DRIED HALOPHYTE PLANTS

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Abstract

Salicornia macrostachya Moric. and *Sarcocornia perennis* subsp. *alpini* belong to the same family- Chenopodiaceae - and share morphological and organoleptic characteristics. The visually appealing in terms of freshness, color, particular taste, nutritional values and health benefits are recognized by their consumers as attributes that warrant their gourmet status. The objective of this work was to study the effect of incubation time on antioxidant capacity of these plants. Moreover, the work investigates the antioxidant activity of the extracts of the two halophyte plants and evaluates the effect of air drying the plants at 40 ^{0}C and the procedure of concentration the extracts before evaluating the antioxidant activity, measured with 2,2-diphenyl-1-picrylhydrazyl (DPPH) method.

The two halophyte plants, *Salicornia macrostachya* Moric., and *Sarcocornia perennis* subsp. *alpini* were collected from Portuguese salt pans, in the central region of Portugal, and the aerial parts were used as raw material. The drying of plants was performed in a pilot tray drier at 40 ^{0}C and air velocity of 1.5 m/s, for approximately 3 days. The DPPH free radical scavenging of the methanolic extracts was analysed in extracts obtained from fresh and dried plants. The determination of the antioxidant activity was made with the DPPH radical.

The results showed that, in summary, and regarding the DPPH assay, the incubation time of 15 minutes is enough to measure the DPPH scavenging activity in halophyte extracts. Furthermore, the convective air-drying process at 40 ^{0}C showed to be an appropriate process to increase the shelf life of the halophyte plants and the antioxidant capacity of the halophyte plants, as a response to the stress provoked by the heat and humidity drying conditions. The plant extracts showed significant antioxidant potential, with high radical scavenging activity. The extracts prepared from *Salicornia macrostachya* and *Sarcocornia perennis* had, respectively, values of IC_{50} equal to 1.09 and 1.42 mg/mL. However, the antioxidant activity of extracts obtained from dried plants increased much more since the IC_{50} decreased to around 0.6 mg/mL, regardless of the halophyte plant.

Both halophyte plants are a valuable source of natural antioxidants and nutrients for use in food. Besides, their crude extracts may represent a valuable source for developing novel food products (antioxidant-enriched foods), and/or table salt substitutes that satisfy the desires of consumers in terms of health benefits and sensorial acceptance.

Key words: *Salicornia, Sarcocornia, Extraction, Drying, Concentration, Antioxidant activity.*