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EVALUTION OF THE PHYTOCHEMICAL CONSTITUENTS AND THE ANTIOXIDANT ACTIVITY OF *SUAEDA MONOICA* LEAVES

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ABSTRACT

Halophytic plants are more susceptible to oxidative stress and damage due to high contents of salt and minerals inside these plants. Therefore, adaptation mechanism towards these conditions includes the biosynthesis of singnificant biomass of secondary metabolites such as phenolics , alkaloids…etc .Plants growing in most of North African countries, were taken as example for estimating the phenolic and flavonoids contents as well as antioxidant evaluation in order to understand the effect of habitat of these plant imitation. *Suaeda monoica* (Chenopodiaceace), is a Halophytic plants growing widley on coastal areas of port Sudan has been reported as a high antioxidant with various phytoconstituents in other countries before the present work proved that the species in Sudan contain 13 phytoconstituents and has a high DPPH radical scavenging accompanied with them.

INTRODUCTION

According to the imbalanced environmental conditions and the unhealthy lifestyle, the whole world is nowadays focusing on finding different ways to deal with regenerative diseases such as heart diseases. Antioxidants play an important role as health protecting factors. Scientific evidence suggests that antioxidants reduce the risk for chronic diseases including cancer and heart disease. Primary sources of aturally occurring antioxidants are whole grains, fruits and vegetables.

Halophytes are the category of plants growing under harsh conditions of super-salinity, and are widespread in the coastal Mediterranean climatic conditions and desert oasis. They maintain excessive production of enzymatic, and non-enzymatic secondary metabolites, especially phenolics and flavonoids that primarily work as anti-oxidants and phytoalexins (Salmin & Awad, 2013).

The ability of a plant to reduce reactive Oxygen specious within the body is related to the presence of certain groups of secondary metabolites such as alkalodis, phenolics, tannins, terpene etc. Several metabolites, including saponins, triterpenoid sapogenins, coumarins, flavonoids, phenolic acids, tannins, alkaloids, were reported, in general terms, in *s.monoica* (Eman, 2011; Benhammou et al, 2013; Mohammed et al. 2013; Ghembaza et al, 2016) and only rare evidences were described in detail about these compounds. For example, β-sitoglucoside saponin, which was initially considered absent in *s.monoica* (Kambouche et al. 2011). In the present study, we qantitvely estimated 13 phytochemicals in the leaves of Suaeda monoica, growing in Sudan as well as the antioxidant activity of different fractions of *suaeda monoca* extract.

2. MATERIALS AND METHODS

2-1 Plant material collection

The leaves of *Suaeda monoica* were collected from southern coastal areas of Port Sudan on Febuary17,2021. The plant material was identified by a Field Taxonomist, Dr.Somaya Khider Department of Botany, College of Scince, University of Red Sea.

The collected samples were cut into small fragments and shade dried. The dried plant material (1000g) was extracted with methanol over 3 days the extract was filtered out though Whatman filter papers, concentrated by rotatory evaporator, and allowed to air dry. the yield was 87gm.

2-2 Fractionation

The extract was dissolved in (20% water, 80% methanol), shaked using a sonicator and then transferred to 500 liters sepratory funnel in a portions of 30 grams for each. The fractionation was run with n-hexane defatting chloroform, and finally ethyl acetate. The three fractions in addition to the aqueous layer and the initial crude extract were subjected to DPPH radical scavenging assay. The initial crude extract was screened for11 different phytochemicals.

2-3 Phytochemical screening

Saturated sterols (Terpenes), un-saturated Sterols, carbohydrates, Triterpenes, Tannins, Flavinoids, Leuconathyocyanins, Alkaloids, Deoxy sugars,

Cardenolides, reducing compounds and Coumarins were screened in the leaves of *S.monica*, according to the method described by (Harborne, 1998).

2-4 DPPH radical scavenging activity

The method is based on the reduction of DPPH in methanol solution in the presence of a hydrogen donating antioxidant due to the formation of the non radical form DPPH-H (Shen et al., 2010). The free radical scavenging activity of all the *Suaeda monoica* crude extract and fractions was evaluated by 1,1- diphenyl-2-picryl-hydrazyl (DPPH) according to the previously reported method (Shen et al., 2010). Briefly, a 0.1m mol solution of DPPH in methanol was prepared, and 1mL of this solution was added to 3 ml of the solution of the extracts in methanol at different concentration (50,100,200,400 and 800µg/mL). The mixture was shaken vigorously and allowed to settele at room temperature for 30 minutes. Then the absorbance was measured at 517 nm using a UV-VIS spectro-photometer (Shaimadazu). Propyl gallate was used as the reference. Lower absorbance values of reaction mixture indicate higher free radical scavenging activity. The capability of scavenging the DPPH radical was calculated.

3- RESULTS

3-1 DPPH radical savaging assay of *Suaeda monoica* leaves

As shown on table (3-1), amongst all, the Ethyl acetate fraction showed the highest antioxidant activity.

Table (3-1): Free Radical Scavging Activity of Different *Suaeda Monoica* Fractions.

Serial Number	Sample	% RSA±SD (DPPH)
1	Crude	87± 0.04
2	Aqueous	Inactive
3	Hexane	57± 0.02
4	Chloroform	40± 0.06
5	Ethyl acetate	90 ± 0.01
Standarad	Propyl gallate	93± 0.01

Where % RSA: radical scavenging activity

3-2 Phytochemical screening of *Suaeda monoica*

As shown in table (3-2) Suaeda monoica showed the presence of all screened phytoconstituents.

Table (3-2): Phytochemical Screening of Suaeda Monoica Extract.

Phytochemical Catagory	Presence
Saturated sterols (terpenes)	++
Un -saturated sterols	+
Triterpenes	++
Saponins	+++
Tannins	+++
Flavonoids	+++
Leucoanthyocyanins	++
Alkaloids	+++
Deoxy sugar	+
Reducing compound	++
carbohydrates	+
Cardenolides	++
Coumarins	+

Where, not detected, + detected and +++ highly detected

CONCLUSION

The significantly high antioxidant potential of *Suaeda monoica* is directly proportional to its high phytochemical content. It was interesting that the plant showed presence of all tested phytochemicals which brings attention to it as a promising medicinal plant that is highly recommended to be explored further for potential application in the pharmaceutical fields.

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