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Data Article

Chemical composition, antimicrobial and antioxidant activities data of three plants from Tunisia region: *Erodium glaucophyllum, Erodium hirtum and Erodium guttatum*

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ABSTRACT

In the present work, phytochemical contents (total phenolic content, total flavonoids, and condensed tannins), antioxidant potentials, and antimicrobial activities of three plants in the Mediterranean genus Erodium (*Erodium glaucophyllum*, *Erodium hirtum*, and *Erodium guttatum*) from the Tunisia region were analyzed. The results showed that *E. glaucophyllum* contained high levels of polyphenols, flavonoids, and tannins. Therefore, *E. glaucophyllum* possesses high antioxidant activities (2,2-diphenyl-1-picrylhydrazyl and ferric reducing antioxidant power scavenging activities), and high inhibition of linoleic acid oxidation. All three plants exhibited high antimicrobial activities. This study highlights tree plants' importance as dietary sources for natural antioxidants can be used in traditional medicine and the pharmaceutical industry.

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Specifications Table

Subject area	Biology
More specific subject area	Medicinal plants chemical composition and activity
Type of data	Table, figure
How data was acquired	Three plants as dietary sources of natural antioxidants, and anti-microbial activity.
Data format	Analyzed
Experimental factors	Chemical composition, antimicrobial and antioxidant activities of *Erodium glaucophyllum, Erodium hirtum and Erodium guttatum*
Experimental features	Biochemical composition and anti-microbial activity.
Data source location	The samples were collected from Tunisia region
Data accessibility	With this article

Value of the data

- Data presented here provide Chemical composition, antimicrobial and antioxidant activities of *Erodium glaucophyllum, Erodium hirtum and Erodium guttatum.*
- Determination of the phytochemical content, total phenolic compounds, total flavonoids, and condensed tannins.
- Evaluation of the antioxidant power and antimicrobial activity of the three plants.
- Results have also important role sources of natural antioxidants, and might be appropriate for the development of reliable index to estimate tuber richness with bioactive molecules.

1. Data

Results indicated in Table 1 showed that the three plants contained high levels of polyphenols: 124 ± 6 mg GAE/ml, 180 ± 4.02 mg GAE/ml and 248.08 ± 2 mg GAE/ml for *Erodium guttatum, Erodium hirtum* and *Erodium glaucophyllum*, respectively. In addition the plant showed high levels of flavonoids with *E. glaucophyllum* being the richest one (91.97 ± 1.56 mg RE/ml). Concerning the levels of tannins they were 20 ± 0.5 mg TA/ml, 42 ± 1.3 mg TA/ml and 31.87 ± 0.38 mg TA/ml, for *E. guttatum*, *E. hirtum* and *E. glaucophyllum*, respectively. In parallel, antioxidant activities of the plants were investigated namely radical DPPH scavenging activities, the reducing power and inhibition of the peroxidation of linoleic acid. Furthermore, the *E. glaucophyllum* process high antioxidant activity (Table 1).

Table 1
Reducing power, DPPH radical scavenging activity, and inhibition of the peroxidation of linoleic acid activity.

Extracts	Total phenolics (mg GAE/g DR*)	Flavonoids (mg RE/g DR**)	Condensed tannins (mg CE/g DR***)	Reducing power (IC_{50} µg/ml)	DPPH (IC_{50}; µg/ml)	inhibition of the peroxidation of linoleic acid (IC_{50}; µg/m)
Erodium hirtum	180 ± 4.02	63 ± 4.1	42 ± 1.3	16.3 ± 2	49.1 ± 3.6	42.5 ± 4.2
Erodium guttatum	124 ± 6	52 ± 2.3	20 ± 0.5	28.1 ± 1.8	56.9 ± 3.3	71.03 ± 9.3
Erodium glaucophyllum	248.08 ± 2	91.97 ± 1.56	31.87 ± 0.38	14.98 ± 1.26	20.29 ± 2.64	37.22 ± 2.36
Vit C				13.15 ± 1.65	5.18 ± 1.98	–
AG					–	13.18 ± 1.21

Results are expressed as mean of 3 experiments $\pm$ SD.

* mg GAE/g DR: mg gallic acid equivalents per g dry residue.
** mg RE/g DR: mg of rutin equivalent per gram dry residue.
*** mg CE/g DR: mg catechin equivalent per gram dry residue.

Table 2
Antimicrobial activity of tree plants extracts.

Bacteria	Gram	Inhibition zone (mm)			
		Erodium glaucophyllum	***Erodium guttatum***	***Erodium hirtum***	***Streptomycin***
Escherichia coli 25922 ATCC	Gram (−)	16.4 ± 2	8.2 ± 1.7	5.3 ± 1	28.2 ± 4
Escherichia coli 8739 ATCC	Gram (−)	14.4 ± 3	5.7 ± 1	2.7 ± 0.5	30.2 ± 2.5
Staphylococcus aureus 25923 ATCC	Gram (+)	9.1 ± 1	6.4 ± 2.6	8.2 ± 2.5	25.4 ± 2
Serratia marcescens (Enterobacteriaceae) 13880 ATCC	Gram (−)	5.2 ± 0.9	3.9 ± 1.2	2.1 ± 0.5	24.1 ± 3
Enterococcus aerogenes ATCC (13048)	Gram(−)	11.6 ± 2	6.7 ± 2.3	3.6 ± 1	26.6 ± 1
Enterococcus faecalis 29212 ATCC	Gram (+)	10.9 ± 3	8.1 ± 2	7.4 ± 2	23.5 ± 3
Pseudomonas aeruginosa 27853 ATCC	Gram (−)	2.4 ± 1	–	–	18.1 ± 2

Results are expressed as mean of 3 experiments ± SD.

In addition, the results (Table 2) showed that the three plants exhibit high antimicrobial activity. Furthermore, the *E. guttatum* possess high antimicrobial activity compared to *E. glaucophyllum*, and *E. hirtum*. These results show a high correlation between polyphenol content and antimicrobial activity. As a potential drug, three plants needs to be explored properly following bioactivity-directed fractionation in order to isolate bioactive constituents and to evaluate its therapeutic effects.

2. Experimental design, materials, and methods

2.1. Material

The tuber of the three plants of *E. glaucophyllum, E. hirtum* and *E. guttatum* were collected from Jebel Orbata National Park-Gafsa- Tunisia regions. Fifty grams of leaf powder is extracted by maceration in a volume of 400 ml of a water–methanol solution (50%, v/v), for 24 h and with continuous stirring. All strains were obtained from Laboratory of Extremophile plants, Center of Biotechnology at the Ecopark of Borj-cédria. Hammam-Lif. Tunisia.

2.2. Determination of total phenolic content

The total polyphenols phenolic compounds were determined according to the method [1]. The results were expressed as gallic acid equivalents (mg GAE/g DR).

2.3. Determination of total flavonoid content

The level of flavonoids is determined based on the capacity of formation of a yellow flavonoid-aluminum complex whose maximum absorbance is at 510 nm [2]. The amount of total flavonoid was reported as rutin equivalents (mg RE/g DR).

2.4. Condensed tannins contents

The determination of the condensed tannins in the different extracts is carried out according to the method of Broadhurst and Jones [3], modified by Heimler et al. [4]. Condensed tannins were expressed in milligrams of catechin equivalent per gram of extract (mg CE/g DR).

2.5. Antioxidant activity

The antioxidant activities were measured by different tests; the scavenging activity on DPPH radical of extracts was estimated as reported by Okawa et al. [5]. The reducing power of the extracts was determined according to the method reported by Choi et al. [6]. The peroxidation of linoleic acid was determined according to the method of Tlili et al. [7].

2.6. Antimicrobial activity

The antimicrobial activity of the extracts was determined by the diffusion method in agar medium cited by Oyaizu [8] and Celiktas et al. [9] with a slight modification, this method was employed to determine inhibition diameter of the extract against 6 g negative and gram positive strains.

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Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2018.07.005.

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