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COMPARATIVE STUDY OF FLAVONES CONTENT IN DIFFERENT EXTRACTS OBTAINED FROM *PORTULACA OLERACEA L.*

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Abstract

Portulaca oleracea L. is a plant of the *Portulacaceae* family, *Caryophyllales* order, *Caryophyllidae* subclass, *Magnoliatae* class, which can grow up until 40 cm height. Is considered a weed species through culture or sandy places. In Romania is surnamed the pig weed, fat weed, or pig's bread (purslane). Purslane is considered as a rich source of many amino acids. Purslane has been described as a "power food of the future" because of its high nutritive and antioxidant properties. Because this plant is a spontaneous species, uncultivated in our country, less studied in pharmacy-botanic terms, we have proposed, in this work, the study the chemical composition of *Portulaca oleracea L.* populations from Bihor County. We obtained three extractions with different solvent and determined the content of polyphenolic compounds. The extracts have a low content of polyphenols.

Key words: *Portulaca oleracea L.*, herb, flavones, antioxidant, spectrophotometry UV-VIS

INTRODUCTION

Of *Portulaca* genus are known more than 100 species, most of which are cultivated as ornamental plants. In Romania are known two species: *Portulaca oleracea L.*, nicknamed as dubbed fat, pig weed, fat weed or pig's bread (*Purslane*), and *Portulaca grandiflora Hook*, known as rose moss or stone flowers.(Anghel A. I. et all, 2011, 2013, Ciocârlan V., 2009).

Portulaca oleracea L., considered weed, it is spread in cultures or sandy places, which can reach a height of 40 cm, presents two varieties: *oleracea* variety (weed with creeping stems) and *sativa* variety (a more robust plant with erect stem). (Szabo I., 2007, Ciocârlan V., 1988)

It is mentioned by Dioscoride in the list of medicinal plants, used by the Dacians, as *lax* and it is officinal in Chinese Pharmacopoeia (Cheng L. et all, 2011).

Figure 1. Portulaca oleracea L.

Portulaca oleracea L. has a pivoting root, with fleshy, creeping, cylindrical stem, able to develop erect stems too, usually of a red color. The leaves are spatulated, juicy, narrow towards the base, of a dark green color. The flowers are small and yellow, having different shades. The fruit is a capsule (pyxis) with several small grey seeds. It blooms in August – September (Figure 1) (Temelie M. 2005, 2008, Vodă C., 2008).

It is rich in Omega-3 fatty acids, large amounts of vitamin A, vitamin C, vitamin E, beta carotene and glutathione, with a strong anti-inflammatory effect (Uddin Md. K., et all, 2012, Bungău, S., 2014, Bungău et al, 2011, Bungau et al, 2011, Bungău et al, 2003).

In the specialized literature it is described as a plant with strong antioxidant action, very efficient in the fight against reactive oxygen species, it has a bactericidal-, emollient-, anti-diabetic-, sedative-, diuretic- and anti-inflammatory action (Ciulei I., 1995, Istudor V., 2001, Okafor I. A, 2014).

This species is less studied and given the fact that it is a spontaneous species, uncultivated in our country, in this work we proposed to study some populations of *Portulaca oleracea L.*, harvested in August – September 2014, in Bihor County.

The morphological-anatomical studies by longitudinal section, both in the main stem and in its branches, were highlighted the following structures: the epidermis consists of small cells with very thick external walls. Under the epidermis is highlighted the bark, with a parenchymatic texture, rich in big, juicy cells, of a round - oval form, with numerous mineral crystals (insoluble oxalate) having the shape of a Druze. The central cylinder presents a prominent pericycle, numerous libero-wood beams and gaps, and the marrow is present.

MATERIAL AND METHOD

The analyzed vegetal material it is represented by the aerial species of *Portulaca oleracea L.*, which was harvested wild flora from the plains of Bihor County, more precisely from Berechiu. The species identification was based on the morphological characters of aerial parts (stems, leaves and flowers), highlighted either at harvest places, or based on the plates made by pressing the vegetal material. The harvested material was dried at room temperature and then stored in paper bags, in places away from light and moisture.

In order to obtain obtain the analyzed abstracts, various solvents were used. It was obtained a methanolic extract, one aqueous and an ethanolic one. The methanolic and ethanolic extract was obtained by extraction in water bath at 60ºC of 1g vegetal product with 100 ml solvent, at reflux, in a flask with an ascending cooler for 30 min. The aqueous extract was obtained by infusion.

The quantitative determination of flavonoids was performed by the technique indicated in Romanian Pharmacopoeia, 10th edition, at *Cynarae folium* monograph, based on flavones property to form chelates with aluminum chloride of an intense yellow color.

The spectrophotometric determinations were performed using a spectrophotometer UV-VIS JASCO V-530, and the results were expressed in rutoside (mg rutoside/100 g vegetal product).

The flavonoids concentration of the analyzed samples it is calculated with the help of a standard curve, determined in parallel and in the same conditions as the sample solution. It is read the extinction in vats of 1 cm at a wavelength of 430 nm.

In order to calculate flavones concentration, it was used a calibration graph in rutoside.

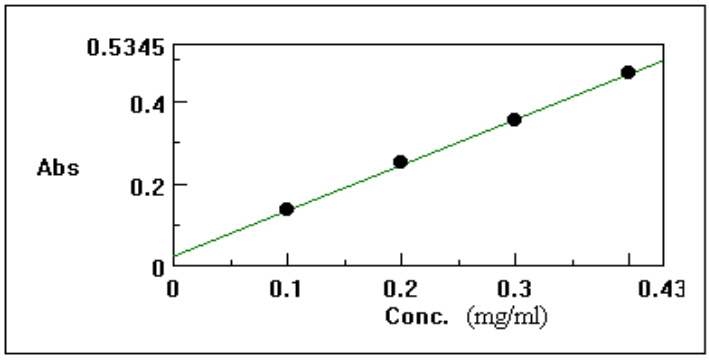

Fig.2. Calibration graphic for rutoside (y = 0,0269 + 1.0996x)

The qualitative analysis of flavonoids was performed by chromatography on a thin layer. There were used reference solutions, sol. of 0,1% of rutoside, izoquercitrozida, quercitrozida, chlorogenic acid and caffeic acid. For detection the plate is sprayed with a solution of 10g/L of reagent NEU (methanolic diphenylboryloxyethylamine) in ethanol and then with a solution of 50g/L of polyethyleneglycole 4000 in methanol. After 30min the plate is examined under UV light at 365nm.(Gîtea D. et all, 2007).

RESULTS AND DISSCUSIONS

The results of spectrophotometric dosages are shown in table 1 and refer to the total of flavonoids, expressed in rutoside.

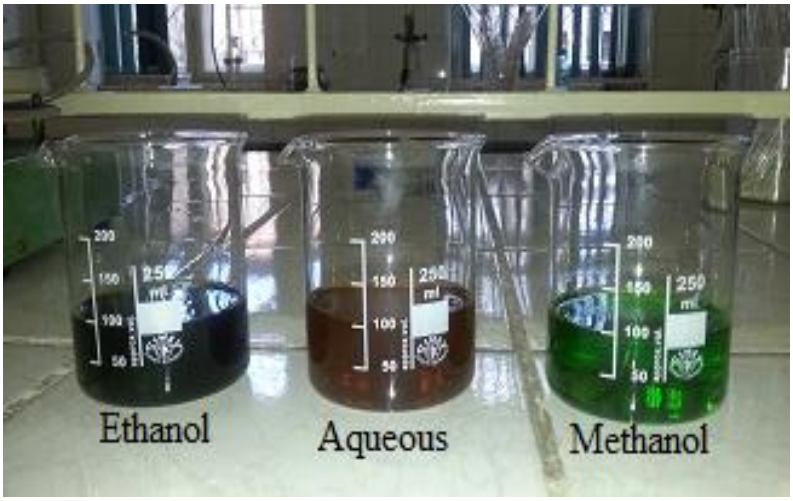

Fig. 3. Ethanol, aqueous and methanol extract from Portulaca oleracea L. herb

Table 1

The flavonoids content of *Portulaca oleracea L.* species
(mg% in rutoside)

Extract	Absorbance	Concentration in extractive solution of 0,1%	Concentration of flavonoids in rutoside mg%
Methanol E.	0,193	0,151	0,75
Aqueous E.	0,152	0,114	0,57
Ethanol E.	0,249	0,202	1,01

After examining the chromatogram, there are observed spots with blue fluorescence corresponding to polyphenol carboxylic acids, with a greater intensity in case of ethanol extract and for caffeic acid (Rf = 0,92).

CONCLUSIONS

Portulaca oleracea L. species are characterized by a low content of flavonoids compounds. The ethanol extract has the highest content of flavones. These results are in accordance with the results of other studies, which demonstrated the low content of flavonoids compounds of this species. The therapeutic benefits of this species are due to other chemical compounds, which are found in the vegetal product, their dosage being a further subject to other researches.

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