

THE QUANTITATIVE ANALYSIS OF FLAVONOID COMPOUNDS IN THE SPECIES OF *TEUCRIUM CHAMAERYS* AND *HIPPOPHAE RHAMNOIDES*

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Abstract

*The present study represents the quantitative analysis of the flavonoid compounds in the aerial parts of *Teucrium chamaedrys* and fruits of *Hippophae rhamnoides*. The quantitative analysis has been performed according to the officinale method stipulated in FRX in the monography of *Cynare folium*. The result is expressed in rutoside g%. The content in herbs is of 0.511 g% and in fruits is of 1.950 g% which is around four times higher.*

Keywords: *flavonoid, quantitative analysis, *Teucrium chamaedrys*, *Hippophae rhamnoides*, rutoside.*

Introduction

Seaberry (*Hippophae rhamnoides* L) is an undergrowth plant, moisture tolerant, growing in vast bush areas on sandy and stony salt soil (Pârvu, 1997). Seaberry is a very frost resistant and also drought resistant plant, loving key light.

Seaberry is spread in Europe and Asia growing even at high altitudes. Seaberry has many white thorny branches with alternate, narrow, speary, medial vein leaves colored in light grey. The yellow flowers start to shape in autumn but start to bloom after the winter, from March till May. The spherical or oval fruits have a hard stone (Flora Romaniei, 1965).

Seaberry fructifies once at two years. The fruits start to harvest from August till September or October. The yellow or orange fruits have sourish taste, specific and pleasant odour.

Seaberry's fruits are the richest source of A, E vitamins, carotenoids and flavonoids. Also, the fruits contain considerable quantities of oryzamin, lactoflavin, K vitamin, microelements, essential fat acids and phytosterols. From seaberry fruits it can excerpt

very rich oil. The seaberry oil is internal used to treat some diseases as gastric and duodenal ulcer, diarrhea, rheumatism, hepatic affections, anemia, asthenia and also external used in skin diseases.

Teucrium chamaedrys (germander) is reputed for its medicinal value in the folk medicine of Romanian. The boiled leaves are used as a cooling draught in fever. The plant is given as a bitter drink against stomach aches especially in children, and the crushed leaves are applied to open wounds. Some pharmacological activities of an alcoholic extract have been reported (Pârvu, 1997). It was also used as a digestive tonic, antiseptic, diuretic, stimulant, fever cure, astringent, and as a cure for asthma. It was used as a substitute for hops in beer (Mossa, 1983). Fruit of *Teucrium chamaedrys* consist of four small nut forms, each containing a single seed (Rodal's Encyclopeda, 1998).

The present study represents the quantitative analysis of the flavonoid compounds in the aerial parts of *Teucrium chamaedrys* and fruits of *Hippophae rhamnoides*.

Experimental

Fruit of herb from these plants were subjected to analysis (in the month of June – herba and in december - fruits). The quantitative analysis of flavonoid was performed according to the officinal method stipulated in FR X (Farmacopeea X, 1998) in the monography *Cynare folium*; the result is expressed in rutoside g%.

The analysis was performed on dry vegetation which had been previously freed of lipids. Therefore, the vegetal powder accurately weighed on analytical scales, 1 gram, was introduced into a filter paper cartridge and then it was freed of lipids by chloroform extraction in a Soxhlet installation. The cartridge was died at 50°C to evaporate the solvent. The material obtained was subjected to extraction twice with 50 ml ethylic alcohol of 50 degrees, on water bath for 30 minutes and the hot solution was filtered in cotton wool. The two substances were then mixed and the solution was added 100 ml of the same solvent (50 degrees alcohol).

Thus, **the solution A** is obtained (100 ml). 10 ml of solution A gets diluted with methanol at 25 ml in a flakes balloon, then shake it for 2-3 minutes and pause for 10 minutes. Then it gets filtered and the first parts of filtrated get removed.

The test solution was obtained by adding 5 ml filtrated of 5 ml sodium acetate 100 g, and 3 ml aluminum chloride 25g/ l. Then shake it well and add methanol at 25 ml in flakes balloon. After 15 minutes, if necessary add another 25 ml methanol and determinate the degree of absorption of the test solutions at a wave length of 430 nm using as an additional fluid a mixture of 5 ml filtrated, 8 ml water and 25 ml methanol in a vessel.

The computation of the concentration of flavonoid of the analysis test was realized with the help of a standard curve, simultaneously performed with the test solution adding 1.0; 2.0; 3.0; and 4.0 ml standard solution of rutoside, 0.1 g/l in methanol, 5 ml sodium acetate 100g/l, 3 ml aluminum chloride 25g/l and methanol at 25 ml in each vessel. As an additional fluid we use the mixture mentioned above.

Results and Discussions

The computation of the concentration of flavonoid has been accomplished with the help of the standard line in figure 1. Thus, in 25 ml we'll have resulted at 430 nm:

$$X = \frac{A}{0.9163} \text{ mg rutoside} \quad (1)$$

In relation (1), A is the extinction of the final solution.

The computation formula to calculate the content of flavonoid is:

$$F \text{ g\% in rutoside} = \frac{4X}{g} \quad (2)$$

In this formula, X represents weight (in mg) of flavonoid corresponding to the resulted extinction, and g is the quantity of extracted matter in process

The quantitative determination of flavonoid in the products subject to analysis confirmed the observation furnished by the semi quantitative analysis obtained through fotodensitometry. The values in percentages for each vegetal product subject to analysis we given in table 1.

The results obtained reflect a rich content of flavonoid in the fruit of *Hippophae rhamnoides*, appreciatively 4 times higher than in *Teucrium* herb. More than that, establishing the content of flavonoid in the *Teucrium herb* has been for the first time performed.

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Chamaerys and Hippophae Rhamnoides*

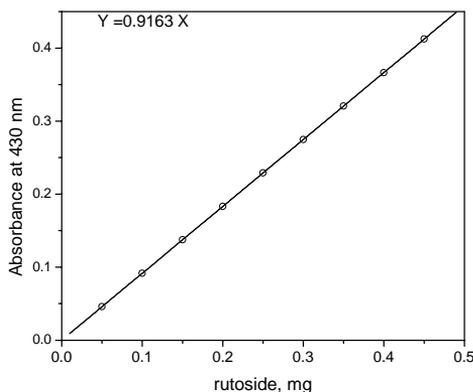


Figure 1. The standard curve for establishing of the content of flavonoid

Table 1. The total amount of flavonoid in rutozide

Vegetal product	Flavonoid g% (in rutoside g%)
Fruits <i>Hippophae</i>	1.950
Herb <i>Teucrium</i>	0.511

Conclusions

The quantitative study of the flavonoid compounds was performed according to the method of FR X, the monography *Cynare folium*. This study points to the fruits of *Hippophae rhamnoides* to be the vegetal organ with the highest content of flavonoid, 1.95 %, expressed in rutoside.

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