

THE QUANTITATIVE DETERMINATION OF ACTIVE PRINCIPLES FROM *CALENDULA OFFICINALIS L.* INFLORESCENCES

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Abstract

In this paper we followed to determine the quantity of active principles from the flowers of *Calendula officinalis L.*, variety *Plamen*. In the Romanian Pharmacopoeia Xth Ed's officinale the *Calendulae flos* product (flower of marigold or calendula), represented by the flowers of *Calendula officinalis L.* plant, dried after harvesting. Were identified and quantified following classes of compounds: mucilage, flavonoids and carotenoids by spectrophotometric methods.

Keywords. *Calendula officinalis*, spectrophotometry, mucilage, flavonoids, carotenoids

INTRODUCTION

Calendula officinalis L., Fam. *Asteraceae (Compositae)* is one of the plants which takes a privileged position, having so many therapeutic uses, as a medicinal plant and use as an ornamental plant because of its yellow orange flowers that can be admired from June to late autumn.

Medicinal plant product, is the flowers-yellow-orange antidii surrounded by green bracts without stalk (*Calendulae flos cum receptaculis*) or only ligulate flowers (*Calendulae flos sine receptaculis*).

MATERIAL AND METHODS

We followed the quantitative determination of the active principles from the inflorescences of *Calendulae flos*, typically variety *Plamen*. In order to carry out experiments dry plant material has been subjected to grinding, resulting a fine powder (sieve VI FRX). We taken for work 20 g plant material.

Successive extractions were carried out in the Soxhlet apparatus. Extraction was carried out with the following solvents: n-hexane, chloroform, methanol and water. After each extraction was determined dry residue (FRX) using weighing ampule and reported as a percentage.

In terms of quantity, were followed the following classes of compounds: mucilage, flavonoids and carotenoids.

Mucilages were dosed by the gravimetric method, following its isolation by the following technique: vegetable product, subjected to

Soxhlet apparatus prior to subsequent extraction with n-hexane, chloroform and methanol were extracted with 200 ml of water boiling water bath for two hours in a flask equipped refrigerant upward. The extract obtained was precipitated with ethanol acidified with 1% acetic acid. The preparation obtained was isolated by centrifugation, dried for three days in a desiccator over calcium chloride siccum, then determined gravimetrically.

Flavonoids were quantified by spectrophotometric method indicated from *Cynarae folium* in FRX for the content expressed in rutozide 9g % was used for calculation of the calibration curve rutozide.

Carotenoids were extracted and determined quantitatively as indicated by Neamtu and Tamaş techniques using spectrophotometric method, beta carotene content is expressed in mg/100g.

Alongside was followed by microscopic analysis, the number of cromoplaste in the cell structure ligulate flowers of *Calendula officinalis L.*

RESULTS AND DISCUSSION

Analyzing the results it is observed that inflorescences o typically *variety Plamen* have a medium content of carotenoids and flavonoids and mucilage are large enough proportion so may print some pharmacological actions.

Tabel 1

The results of the quantitative determination of the active principles of the plant product *Calendula officinalis L.*

The active principle	Quantity
Carotenoids(mg% - caroten)	7,5
Flavonoids (g% rutozidă)	0,55
Mucilage (g%)	3,83

As a result of the determination of the dry residue of the extract with n-hexane, chloroform, methanol and water were obtained the results shown in Fig. 1.

The highest percentage of dry residue in the case of methanol extract was obtained, while the chloroform extract a small number of substances, possibly free triterpenes.

The methanolic extract, in addition to flavonoids can be saponins, which explains the high efficiency of the solvent extraction.

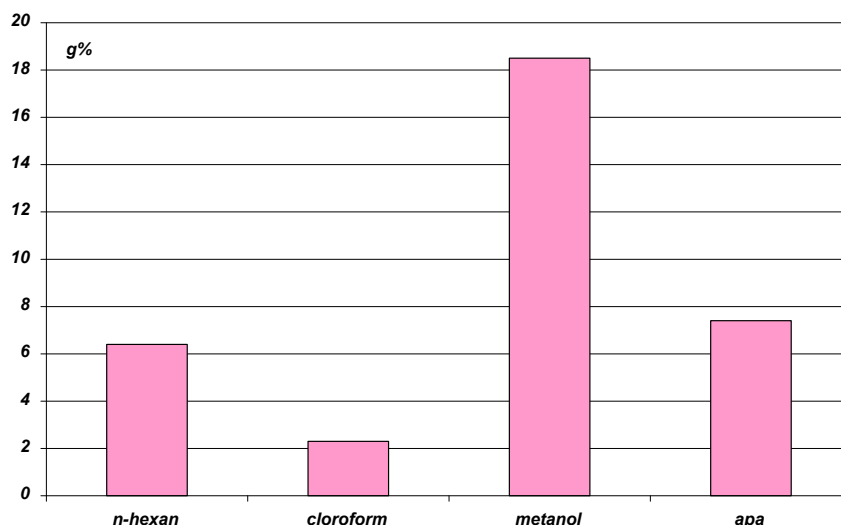


Fig. 1. Determination of dry residue of plant product *Calendula officinalis* L.

CONCLUSIONS

In the chemical composition of the inflorescences of *Calendula officinalis* L. (marigold) were found: carotenoids, flavonoids and mucilage in a considerable number, which explains the pharmacological properties of the plant. Marigold flowers are used in practice because of its local antiinflammatory action.

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