

ASSESSMENT OF AVAILABLE PHYLLLOCHINON IN THE LEAVES OF BERBERIS THUNBERGII DC

Smoilovska H. P.

*Candidate of Pharmaceutical Sciences,
Associate Professor at the Department of Pharmacognosy,
Pharmaceutical Chemistry and Medicinal Preparations Technology
Zaporizhzhya State Medical University
Zaporizhzhya, Ukraine*

Family Berberidaceae contains approximately 15 genera and 650 species. Specimen of this family is grown up practically in all continents but mostly they occur in temperate and subtropical areas in the northern hemisphere [1, p. 9], [2, p. 97].

Chemical composition of *Berberis vulgaris* is the most explored in family Berberidaceae. All organs of *Berberis vulgaris* contain alkaloids (berberin is the main), flavonoids (rutin, isoquercetin, quercetin, campferol, apigenin, lutein), cinnamomic acids (coffee acid, chlorogenic acid), tannins. *Berberis* fruit, except substances above-mentioned, contain organic acids, glycosides, pectin. *Berberis* leaves contain vitamins K₁ (phylllochinone) and E, essential oil, flavonoids [3, p. 108].

Berberis fruit, bark, leaves, roots are used in folk medicine. Medicinal teas based on *Berberis* tonic organism, increase blood coagulation, intensify bile secretion, cause angiostenosis and uterus contractility.

Nowadays cultivation of different species of *Berberis* is wide-spread all over the world. *Berberis thunbergii* DC due to its adequate acclimatization is cultivated according to special techniques of cultivation [4, p. 4]. But availability and accumulation of biologically active substances including vitamin K, in *Berberis* species cultivated in Ukraine are not studied yet.

Materials and methods.

Research object: leaves of *Berberis thunbergii* DC, brand “Atropurpleanana”, stored up in Zaporizhzhya within the vegetation period 2014. The plants of this brand have been cultivated as ornamental plants. Purveyance of leaves has been carried out in different vegetation periods from May to September. The raw-materials gathered have been dried by thin layer turning it from time to time in the shade under shed at temperature 30 – 35 C.

To identify and isolate individual compounds techniques TLC have been used on the plates “Sorbfil AΦ-A” in system benzol-petroleic ether (1:1). Standard

samples have been used in the research: reagents, solvents according to requirements of the State Pharmacopoeia of Ukraine.

1,0 raw-materials crushed into 1mm fragments were placed into 25 ml retort, then 10 ml hexane were added and all it was intermixed for 120 minutes, then it was filtrated, solvent was distilled in the hood at temperature not above 45 C to 2 – 3 ml volume. 0.1 ml extraction was brought upon the plate “Sorbfil AF-A”. The plate was dried a little and submitted to chromatography, after it was dried out and sustained under UV for 2 minutes.

To carry out adequate reaction 1.0 air – dry plant raw-materials Berberis was extracted three times with petroleic ether (1:5) for 5 minutes; 5ml extract was shaken up with 2 ml aniline. Aniline layer had yellow color.

Vitamin K amount in plant raw material has been assessed by spectrophotometry. For this procedure analytic sample of raw material had been crushed to fragments capable to penetrate through sieve with mesh diameter 1mm. Accurate amount (0.5) was placed in 100 ml conic retort and extracted three times. 25 ml of 96% spirit solution were heated on boiling water bath for 15 minutes. Hot extracts were filtrated into 100 ml retort. 4 ml of lead acetate solution 10% was added to hot extraction by heating on boiling water bath for 2 minutes till obtaining precipitation coagulation, then it was cooled and filtrated into 100 ml measured retort, 96% spirit was added up to the mark. Solution obtained 5 ml was transferred in 50 ml measured retort and 96% spirit was added up to the mark. Solution optic density was measured on spectrophotometer Specord-200 Analytic Jena UV-vis at wave length 236 nm in cuvette with 10 mm layer. Spirit 96% was used as solution for comparison.

Simultaneously optic density for phyllochinone standard solution (Sigma, 98%) was measured. Accurate amount of phyllochinone (about 0.005 gr) was placed into 100 ml measured retort, 50 ml 96% spirit was added and intermixed to complete dissolution. Solution volume was completed with spirit to the mark (solution 1). 2.5 ml solution 1 were transferred in 25 ml measured retort, solution was completed with spirit 96% to the mark and was intermixed (solution 2).

Results.

When vitamin K₁ was revealed by TLC method on the plate “Sorbfil AF-A” a spot with yellow-green fluorescence appeared displaying the presence of vitamin K (R_f=0.67). While spraying with 5% solution phosphoro-molybdenic acid chromatograms obtained the brown-brick-red spots were observed.

Method of spectrophotometric analysis concerning vitamin K₁ in Berberis plant raw material had been elaborated due to using intensive maximum absorption revealed at 236 nm (figure 1). The data obtained are presented in table 1.

The data obtained indicate that the highest concentration of vitamin K₁ in the leaves of *Berberis thunbergii*-DC is observed in blossoming and right away after it (May, June) and reaches $5.59 \pm 0.03\%$. Gradually vitamin K₁ content is decreased and in September forms $2.62 \pm 0.08\%$.

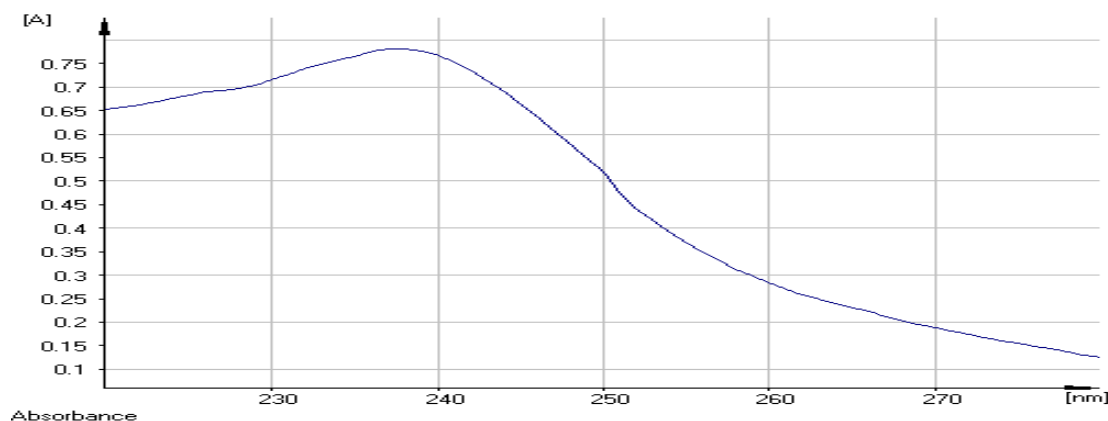


Figure1. UV-spectrum for absorption of ethyl extraction from the leaves *Berberis thunbergii* DC.

Table1

Amount of vitamin K in the leaves *Berberis thunbergii* DC. ($\bar{x} \pm \Delta \bar{x} \%$), n= 5

Season of purveyance	Amount
<i>Berberis thunbergii</i> DC., May	$4,84 \pm 0,02$
<i>Berberis thunbergii</i> DC., June	$5,59 \pm 0,03$
<i>Berberis thunbergii</i> DC., July	$3,27 \pm 0,06$
<i>Berberis thunbergii</i> DC., August	$3,17 \pm 0,04$
<i>Berberis thunbergii</i> DC., September	$2,62 \pm 0,08$

Conclusions

Phyllochinone amount in the leaves *Berberis thunbergii* DC, species “*Atropurpureanana*” has been investigated by spectrophotometry. Maximum concentration for vitamin K₁ has been observed during flowering and at once after it. It is $5.59 \pm 0.03\%$.

References:

1. A comparative study of barberry fruits in terms of its nutritive and medicinal contents from CKNP region, Gilgit-Baltistan, Pakistan / Mohammad Saeed Awan¹, Sartaj Ali¹, Amjad Ali [et al.] // J. Bio. & Env. Sci. – 2014. - Vol. 5, No. 2. - P. 9 - 17.

2. Comparative Study of Berberis vulgaris Fruit Extract and Berberine Chloride Effects on Acetic Acid-Induced Colitis in Rats / Mohsen Minaiyana, Alireza Ghannadib, Parvin Mahzounic and Elham Jaffari-Shirazi // Iranian Journal of Pharmaceutical Research. – 2011. – N 10 (1). – P. 97 – 104.

3. Характеристика антирадикальной активности экстрактов из растительного сырья и содержание в них дубильных веществ и флавоноидов / М. Н. Макарова, В. Г. Макаров, Н. М. Станкевич [и др.] // Раст. ресурсы. – 2005. – № 2. – С. 108 – 115.

4. Жиленко В. Ю. Создание исходного материала для селекции барбариса (*Berberis L.*) в условиях юго-запада ЦЧР : автореф. дис. на соиск. учен. степ. канд. биол. наук : спец. 06.01.05 «Селекция и семеноводство сельскохозяйственных растений» / В. Ю. Жиленко. – Рамонь, 2011. – 22 с.

PROSPECTS OF WIDENING THE RANGE OF DOMESTIC ANTHELMINTHIC MEDICINES OF PHARMACEUTICAL PREPARATION

Tolochko K. V.

*Candidate of Pharmaceutical Sciences,
Associate Professor at the Department
of Pharmaceutical Technology of Drugs*

Vyshnevskaya L. I.

*Doctor of Pharmaceutical Sciences, Professor,
Professor at the Department of Pharmaceutical Technology of Drugs
National University of Pharmacy
Kharkiv, Ukraine*

Under the national policy of import substitution of drugs of foreign production with Ukrainian, pharmaceutical compounding of medicines is one of the ways to provide maximally the population of Ukraine with essential medicines. Also, medicines «ex tempore» have undeniable advantages in comparison with industrial not only with individual choice of active ingredients and doses, but because of the lack of adjuvants, flavours and preservatives, thus the risk of allergic side effects can be significantly reduced.

The problem of parasitic diseases has been and remains one of the most acute and urgent worldwide, including Ukraine. Recently, because of the social conditions