

COMPARATIVE PHYTOCHEMICAL ANALYSIS OF TINCTURE AND FRUIT OF JAPANESE PAGODA TREE (*STYPHNOLOBIUM JAPONICUM* (L.)) FROM DIFFERENT MANUFACTURERS

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Introduction. Fruit and buds of Japanese pagoda tree (*Sophora japonica* L.) of the legume family (Fabaceae) are the official medical plant raw materials since they are members of the State Pharmacopoeia of Ukraine.

Several drugs from this raw material are presented in the pharmaceutical market of Ukraine. These are fruit of Japanese pagoda tree in packaged form, fruit tincture and others.

Aim The aim of the study was to compare the phytochemical analysis of fruit and tinctures of Japanese pagoda tree by various domestic manufacturers.

Materials and methods. The determination of the content of impurities, the mass loss during drying, and the total ash in samples of Japanese pagoda tree fruit were carried out gravimetrically. For tinctures, a comparative organoleptic analysis was performed. Determination of the content of hydroxycinnamic acids, the sum of phenolic compounds in medical plant raw materials and tinctures was carried out by direct spectrophotometry at $\lambda = 325$ nm and 270 nm, respectively. The content of flavonoids was determined by the method of differential spectrophotometry at $\lambda = 405$ nm.

Results and discussion. As a result of the conducted researches, it was found that in the Japanese pagoda tree fruit produced by «Apteka likars'kykh trav» LLC contains 0.60% hydroxycholic acids in terms of chlorogenic acid, 2.49% of the sum of phenolic compounds in terms of gallic acid and 0.55% of flavonoids in terms of rutin. The fruit of the Japanese pagoda tree by the company «Kliuchi zdorov'ya» contains 2.13% hydroxycholic acids, 3.84% of the sum of phenolic compounds and 0.53% of flavonoids. It is determined that in the investigated raw material produced by «Apteka likars'kykh trav» LLC content of extraneous impurities is 0.23%, the mass loss at drying is 6.83%, the total ash content is 7.69%. In the medical plant raw materials produced by the «Kliuchi zdorov'ya» these indicators are 2.22%, 7.78% and 11.46% respectively. In the study of tinctures of the Japanese pagoda tree produced by pharmaceutical company "Viola" was found that the content of hydroxycinnamic acids is 0.47%, the amount of phenolic compounds is 0.60% and the amount of flavonoids is 0.44%. The tinctures of the Japanese pagoda tree produced by "Phytopharm" PAO contain 0.45% of hydroxycinnamic acids, 0.59% of phenolic compounds and 0.30% of flavonoids.

Conclusions. As a result of the research, it was found that the Japanese pagoda tree of two Ukrainian producers are close to the content of flavonoids, but differ in the content of hydroxycholic acids and the sum of phenolic compounds. The tincture of the Japanese pagoda tree of two domestic producers has similar values for the content of all three groups of biologically active substances.

STUDY MACRO- AND MICROELEMENT COMPOSITION OF LEAVES *RHODODENDRON PURDOMII*

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Introduction. Macro- and microelements play an important role in the functioning of the human body, namely, they are part of the hormones, enzymes, vitamins and cause chemical and biological activity. Their content depends on many factors, namely: environmental factors, time of harvesting of raw materials, drying conditions, and so on. The system of digestion of the human body, the work of the nervous and cardiovascular system, transportation of nutrients, which comes mainly from food products, water need constant replenishment. The pharmacological properties of phytopreparations are influenced

by the content and composition of minerals in LRS, which must be taken into account during human treatment. It is also necessary to control the level of toxicity of raw materials during harvesting.

One of the promising medicinal plants is rhododendron purdomii (Rhododendron purdomii Rehder & E.H. Wilson), which belongs to the genus rhododendron (Rhododendron L.), which has anti-inflammatory, antimicrobial activity, used in folk medicine in the treatment of cardiovascular diseases.

The purpose of our work was to study the elemental composition of the leaves rhododendron purdomii harvested in the Kharkiv region.

Materials and methods. The object of the study was the leaves of the rhododendron purdomii collected on the collections of the botanical garden of the Kharkiv National Pedagogical University in 2018. The raw material was subject to air-shade drying. The grinding of raw materials was carried out with the help of a dismemberer shredder CO 124 A. To study the elemental composition of raw materials, an atomic emission spectrograph of DFS-8 was used. The analysis consisted in the complete evaporation of the substance in the discharge arc of an alternating current with a source of contamination of spectra of type IBS-28 at a current of 16 A and exposure 60 sec. Spectrum range - 250 - 350 nm. The research was carried out at DNU NTK "Institute of Single Crystals of the National Academy of Sciences of Ukraine". Determination of heavy metals was carried out according to the method of DFU 2.0.

Results and discussion. Results are displayed in the table 1.

As a result of research, 16 elements were discovered. Among the macro-elements, the maximum amount of kalium was accumulated, its content was 1320 mkg / 100 g. This element supports the acid-base balance and the water-salt balance of the body, is involved in the nerve regulation of cardiac contractions. In large quantities, in the leaves of the rhododendron purdomii contained calcium (540 mkg / 100 g), which is the main element of human bone tissue. The natrium content, which maintains osmotic pressure and regulates water metabolism, was 110 mkg / 100 g. Among the microelements lead are ferrum and aluminum (30 mkg / 100 g). It is known that ferrum plays a significant role in the processes of energy release, enzymatic reactions, participates in providing immune functions and cholesterol metabolism. The content of manganese was 3 times less (10.5 mkg / 100 g).

The content of heavy metals in the leaves of rhododendron purdomii didn't exceed the maximum permissible concentrations (MAC).

Table 1

The content of macro - and trace elements in the leaves of rhododendron purdomii

Element						
<i>Macroelements</i>						
Content of the element, mkg / 100g	K	Na	Ca	P	Si	Mg
	1320	110	540	100	72	240
<i>Microelements</i>						
Content of the element, mkg / 100g	Fe	Cu	Mn	Zn	Al	Ni
	30	0,36	10,50	1,80	30	0,21

Note. content (mkg / 100g) - (Co) <0.030; (Cd) <0.010; (As) <0.010; (Hg) <0.010.

Conclusion. For the first time, the method of atomic emission spectroscopy has been used to study the accumulation of macro- and microelements in the leaves of the r.purdomii. The conducted studies indicate the content of a large number of macroelements of kalium, calcium, natrium; microelements - ferrum and manganese.