

creases the neurons' growth rate, inhibits apoptosis and affects monoamine exchange. Citrate is the main intermediate product of metabolic Krebs Cycle.

To sum it all up, injection course of lithium citrate in the doses of 5 and 15 mg/kg reduced severity and duration of thiosemicarbazide convulsions increasing the survivability of animals.

In groups of rats treated with different doses of lithium citrate, anticonvulsant effect was more expressed at the dose of 5 mg/kg due to the duration of convulsions. The model of primary generalized convulsions had a morphological confirmation in all cases of observations and was characterized by a nervous tissue leakage, ischemic damage of neurocytes, demyelination of pathways and circulatory disorders.

Injection course of lithium citrate at the doses of 5 and 15 mg/kg had a neuroprotective effect, increasing resistance neurons to ischemia, reducing the level of demyelination of conductive pathways of the brain minimizing circulatory disorders in nervous tissue.

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CONTENT OF FREE ORGANIC ACIDS IN THE LEAVES OF DANDELION, COLLECTED ON THE TERRITORY OF VITEBSK REGION

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In the manufacture of medicines and cosmetic products from plant raw materials, it is necessary to know exactly the chemical composition of the plants used for these purposes. The phytochemical composition of many wild plants growing on the territory of the Republic of Belarus has not been fully studied. Among them, the dandelion (*Taraxacum officinale*). This plant has

been known for a long time and is widely used in folk medicine because of its medicinal properties. The literature contains information about the laxative, anti-inflammatory, diuretic, expectorant, anthelmintic and sedative effects of this plant. In this case, only the underground part of the plant is used, and the above-ground part is most often discarded. Therefore, the study of biologically active substances of the aboveground part of *Taraxacum officinale* is an urgent and important task[1–3].

The aim of the study: to determine the quantitative content of organic acids in dandelion leaves collected in the spring of 2019 during the budding period of the plant on the territory of Glubokoye, Braslav and Vitebsk districts of Vitebsk region.

The subjects of study were the leaves of dandelion, collected in the spring of 2019 on site Glubokoe, Braslav and Vitebsk districts of Vitebsk region of Belarus.

Quantitative determination of the content of organic acids was carried out by the following method [4]. Crushed in a mortar 10 g of fresh raw materials until smooth. The ground mass was transferred to a flask, poured 100 cm³ of hot distilled water (80°C) and heated in a water bath for 1 hour at 80°C. Then the contents of the flask were cooled, filtered and the volume of the extract was brought to 100 cm³. Pipette selected 20 cm³ extract and transferred to a conical flask, there was also added 2 drops of phenolphthalein. The extract was titrated with 0.1 M NaOH solution. Acidity was calculated by the formula:

$$x = ((a \times V) / (V1 \times m)) \times 100\%,$$

where x – the acidity of the object under study,%; a – the amount of 0,1 n of the alkali solution, which went to titration, ml; V – the total volume of the extract, cm³; V1 – the volume of the extract taken for titration, cm³.

To express the result for one of the organic acids, x was multiplied by the calculated coefficient. 1 cm 0.1 M NaOH solution corresponds to 7,5 mg tartaric, 6,7 mg malic, 6,4 mg citric, 4,5 mg oxalic acid.

Determination of organic acids by this method has a number of advantages: speed and ease of implementation, cheapness, the ability to determine several organic acids, simplicity of calculations. The study was carried out with freshly prepared extracts. All digital material was entered for storage and processing in Microsoft Excel tables.

Organic acids perform a number of vital functions. Tartaric acid reacts with radioactive elements, accelerating their excretion, and increases the rate of metabolic processes. Malic and citric acids are involved in one of the most important biochemical processes – the cycle of tricarboxylic acids. Oxalic acid is one of the intermediate products of metabolism of living organisms [5–7].

The results of determining the content of organic acids are shown in the *table*.

**Quantitative content of free organic acids in extracts
from dandelion leaves collected in different districts of Vitebsk region, M ± m**

	General acidity	Acid content, mg / 1 g raw material			
		Tartaric	Malic	Citric	Oxalic
Vitebsk district	0,22 ± 0,09	0,73 ± 0,03	0,65 ± 0,03	0,62 ± 0,02	0,44 ± 0,01
Braslav district	0,26 ± 0,13*	0,86 ± 0,04*	0,77 ± 0,04*	0,73 ± 0,04*	0,51 ± 0,02*
Glubokoye district	0,42 ± 0,04*	1,05 ± 0,13*	0,94 ± 0,12*	0,89 ± 0,11*	0,63 ± 0,08*

Note: * – $p \leq 0.05$ compared to Vitebsk region

It follows from the table that the total acidity of raw materials from the Glubokoye district is significantly higher than the same indicator of raw materials from the Vitebsk region by 1.90 times. The total acidity of raw materials from the Braslav district is significantly higher than the same indicator of raw materials from the Vitebsk region by 1.60 times. Also from the table it follows that in the leaves of the Glubokoye district, the content of all organic acids is significantly higher than in similar raw materials from the Braslav and Vitebsk regions. The content of tartaric and malic acids is 1.22 and 1.90 times higher respectively; citric – 1,21 and 1,43 times, respectively, and oxalic – 1,23 and 1,43 times, respectively. Differences in the content of organic acids may be associated with the peculiarities of the climatic regime and soils in the Glubokoye and Braslav districts.

Tartaric acid reacts with radioactive elements, accelerating their excretion, and increases the rate of metabolic processes. In humans, tartaric and malic acids increase the elasticity of the skin and enhance collagen synthesis, have an external anti-inflammatory effect, restore the acid-base balance of the skin, accelerate the healing of microcracks. Malic acid also has whitening properties, therefore, can be used to lighten age spots. Citric acid has well-expressed antioxidant and bactericidal properties, promotes faster healing of small inflammatory processes, shows whitening properties. Oxalic acid has bactericidal properties. Like malic and citric acids, it exhibits whitening properties [8, 9].

Thus, the leaves of dandelion medicinal can be used not only for the extraction of pharmacologically active substances, but also in the creation of cosmetic products, such as lotions. Such tools are convenient and easy to use and combine several functions: makeup removal, cleansing and skin care, healing of minor injuries. Lotions containing plant extracts are especially suitable for oily and problem skin care [8, 9].

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ХРОНИЧЕСКАЯ ИШЕМИЯ МОЗГА: ФАРМАКОЛОГИЧЕСКАЯ КОРРЕКЦИЯ МЕТАБОЛИЧЕСКИХ НАРУШЕНИЙ ПЕРИФЕРИЧЕСКОЙ КРОВИ

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Хроническая ишемия головного мозга (ХИМ) характеризуется диффузным и медленно нарастающим нарушением кровоснабжения головного мозга с постепенно прогрессирующими симптомами поражения ЦНС, определяющими степень тяжести заболевания. Атеросклероз вне-мозговых и интракраниальных артерий, артериальная гипертензия, сахарный диабет 2-го типа наиболее часто выступают в качестве ведущих причин возникновения ХИМ, а в механизмах ее развития существенная роль отводится воспалению, активации перекисного окисления липидов (ПОЛ), иммунологической и эндотелиальной дисфункции [1–4]. Лечение больных с ХИМ должно быть комплексным, учитывающим основные звенья патогенеза. Перспективными в этом отношении могут быть препараты иммуномодулирующего действия, такие как полиоксидоний (производное гетероцепных полиаминов).

Цель – определить влияние комплексной терапии больных с ХИМ, включающую назначение полиоксидоний.