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SPECTROPHOTOMETRIC METHOD FOR THE QUANTITATIVE DETERMINATION OF THE ACTIVE SUBSTANCES IN PEDIATRIC PROPOLIS GRANULES

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Propolis is widely used in folk medicine and in scientific medicine on various inflammatory processes [1-3]. The creation of pediatric drugs based on propolis is particularly urgent.

Our aim was to create a technology for the production of propolis granules, which presupposed the development of a spectrophotometric method of establishing the authenticity of the active substances and determining them quantitatively.

The standardization of the crude propolis according to VFS [Provisional Pharmacopoeial Standard] 42-10-84-81 and of the various medicinal forms, including a tincture, according to VFS 42-1936-89, is based on the sum of the phenolic compounds found by a spectrophotometric method.

In a special series of experiments, a purified fraction of the total phenolic compounds of propolis was obtained by column chromatography and its UV spectrum was taken in the wavelength range of 200-400 nm: the UV spectra of the total phenolic compounds and of the crude propolis were similar. It was established experimentally that the intensity of light absorption by an alcoholic solution of the total phenolic compounds at a wavelength of 290 nm obeyed the Bouguer–Lambert–Beer law.

Method for the Quantitative Determination of the Total Phenolic Compounds in Propolis Granules. About 0.05 g (accurately weighed) from 10 g of ground propolis granules is transferred quantitatively into a 50-ml conical flask. After the addition of 20 ml of 95% alcohol the mixture is stirred for 10-15 min and is then filtered through a paper filter (TU-6-09-1705-77 "blue ribbon") into a 50-ml measuring flask. The filter is washed and the volume in the flask is made up to the mark with 95% alcohol.

The optical density of the solution is measured on a spectrophotometer at a wavelength of 290 nm in a cell with a layer thickness of 10 mm. The control solution used is 95% alcohol.

A standard solution of an RSO powder of the total phenolic compounds of propolis in a suitable concentration is prepared in parallel.

The amount of total phenolic compounds in the preparation must be from 0.0675 to 0.0825 g, calculated to one package of the drug.

It follows from the results given in Table 1 that the method developed is characterized by adequate accuracy and sensitivity, and this permits the quality of the finished drug to be evaluated in accordance with the requirements of the State Pharmacopoeia, XIth ed. The UV spectrum of the preparation can be used to identify propolis in the recommended medicinal form.

TABLE 1. Results of the Quantitative Determination of the Total Phenolic Compounds in Propolis Granules

Weight, g	Amount of total phenolic compounds found		Metrological characteristics
	g	%	
0.0501	0.0751	100.15	X=98.94
0.0499	0.0731	97.47	S_x=0.43
0.0496	0.0741	98.90	$P_{0.95}$=1.18±1.21
0.0510	0.0742	99.01	
0.0503	0.0743	99.17	a=98.94±1.18

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REFERENCES

1. N. P. Ioirish, Bees — Winged Pharmacists [in Russian], Nauka, Moscow (1964).
2. V. P. Kivalkina, Abstracts of Lectures at the IInd Scientific Conference on the Use of Apicultural Products in Human and Veterinary Medicine [in Russian], Vol. 2, Leningrad (1977), p. 25.
3. M. D. Mashkovskii, Drugs [in Russian], Parts 1 and 2, Meditsina, Moscow (1985), p. 575.