POLYSACCHARIDES OF *Viola tricolor*

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UDC 615.322(Viola tricolor): 547.458

Wild pansy, which contains a number of biological active substances, has long been used in medicine [1-3]. However, the carbohydrates have been studied inadequately. We have investigated the herbage of *Viola tricolor* L. collected in May-June 1983. The air-dry raw material (moisture content 8.4-9.0%) was treated successively with chloroform and methanol to eliminate pigments and low-molecular-weight substances. The carbohydrates were isolated by a known procedure [4] of fractional extraction. The extraction of the water-soluble polysaccharides (WSPSs) was carried out with hot water at 90-95°C (1:20) for 2 h. The aqueous extract was filtered, evaporated, and treated with 96% ethanol (2 volumes). The resulting precipitate was separated off by centrifugation, was washed with ethanol and with acetone, and was dried *in vacuo* for 6 h. The yield was 8.5-12.3%.

The maximum accumulation of WSPSs was observed in the period of mass flowering of the plant. The pectin substances (PSs) were obtained by successive extraction of the raw material with a mixture (1:1) of 0.5% solutions of oxalic acid and ammonium oxalate at 70°C twice for 2 h each time. The extract was dialyzed against distilled water, evaporated in a vacuum, and precipitated with 96% ethanol (three volumes). Yield: 4.6%. The ash content of the WSPSs was 16.4%.

The PSs (12.1%) were determined by the incineration of samples of them in a muffle furnace at 600°C. The polysaccharides were demineralized by the reprecipitation of aqueous solutions with acidified ethanol and by treatment with KU-2 cation-exchanger (H^+ form). The ash content of the demineralized WSPSs was 0.6% and that of the PSs 0.4%. The polysaccharides were hydrolyzed with 1 N H_2SO_4 at 100°C for 6 h. The monosaccharides in the hydrolyzate were determined by PC in the 1-butan-ol—pyridine—water (6:4:3) system at 22°C for 24-26 h. The monosaccharides were revealed with aniline phthalate in a thermostat at 105-110°C for 10 min.

It was established that the WSPSs consisted of six monosaccharides: D-galacturonic acid, D-glucose, D-galactose, D-xylose, L-arabinose, and L-rhamnose. The amounts of the neutral monosaccharides were determined by a published method [5]. The main components were glucose, galactose, and arabinose in a ratio of 2:1.8:1.1.

In hydrolysates of the PSs, D-galacturonic acid, and D-glucose, and D-galactose in a ratio of 1.2:1, were identified by the PC method. The WSPSs consisted of a water-soluble light yellow powder giving a negative reaction for starch with iodine. The PSs consisted of a light brown powder readily soluble in water.

Thus, the carbohydrate complex of *Viola tricolor* L. includes a considerable amount of water-soluble polysaccharides and pectin substances.

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Pyatigorsk Pharmaceutical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 1, pp. 116, January-February, 1985. Original article submitted August 2, 1984.

0009-3130/85/2101-0113$09.50