CARBOHYDRATES FROM *Ajuga turkestanica*

I. T. Abdukadirov, M. A. Khodzhaeva,
M. T. Turakhozhaev, and A. U. Mamatkhanov

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Two species of *Ajuga* grow in Uzbekistan. Of these, we studied *A. turkestanica* Rgl. (Labiatae).

The aerial part of the plant is a source of biologically active compounds such as ecdysteroids [1] and iridoids [2] that have anabolic activity and cholagogic action.

The present article contains results from investigations of carbohydrates isolated from the aerial part of *A. turkestanica* during vegetation in Surkhandar′ya district.

Literature methods [3] were used to study the carbohydrates. These consisted of removal by $CHCl_3$ of lipophilic substances (LS, 6.75%), successive isolation by ethanol (80°) of sugars soluble in alcohol (SSA, 7.5%) and water-soluble polysaccharides (WSPS, 4.9%), and isolation of pectinic substances (PS, 4.5%) by oxalic acid solution (0.5%).

Solutions of LS and SSA were evaporated to dryness in vacuum in a rotary evaporator. WSPS and PS solutions were condensed and precipitated with ethanol.

WSPS are a light cream-colored powder that is very soluble in water and forms yellowish solutions that do not give a color with iodine solution (0.1 N).

PS are cream colored and form a viscous solution of relative viscosity 5.72 (*c* 0.5, H_2O).

The monosaccharide composition was determined by acid hydrolysis of WSPS and PS (0.5 g each) using H_2SO_4 (2 N, 100°C, 8 h and 36 h, respectively).

Paper chromatography (PC) using butanol:pyridine:water (6:4:3) with anilinium phthalate and alcoholic urea (5%) as developers identified the monosaccharides of the SSA and WSPS and PS hydrolysates.

PC of the SSA fraction detected glucose, fructose, and saccharose; of the WSPS hydrolysate, glucose and fructose; of the PS hydrolysate, galacturonic acid, galactose, glucose, and arabinose.

The IR spectrum of the WSPS showed absorption bands at 3692, 3320, 1420, 1750, 1604, 1146, 940, and 834 cm^{-1}. These are characteristic of a 2→1 bond [4] and similar to absorption bands of inulin.

Thus, WSPS of *A. turkestanica* Rgl. belong to inulin-type glucofructans.

The IR spectrum of PS contains absorption bands at 1150 (esterified carboxylic acid) and 815, 870, and 910 cm^{-1} (triplets of pyranose rings) that are consistent with the presence of 1,4 bonds with predominance of α-glycosidic bonds between galacturonic acid and monosaccharides [5].

The molecular weight of the pectin, 50,450, was determined by viscometry [6]. Titrimetry of the pectin was performed as before [7]: K_c, free carboxylic acids (3.88%); K_e, esterified carboxylic acids (1.75%); degree of esterification, 30.7%. The uronic anhydride content (45.6%) was measured as before [8].

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S. Yu. Yunusov Institute of the Chemistry of Plant Substances, Academy of Sciences of the Republic of Uzbekistan, Tashkent, fax (99871) 120 64 75. Translated from Khimiya Prirodnykh Soedinenii, No. 1, p. 75, January-February, 2004. Original article submitted December 4, 2003.

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