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POLYSACCHARIDES OF *Eichhornia crassipes* AND *Pistia stratiotes*

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Eichhornia crassipes, common water hyacinth (fam. Potedericeae), and *Pistia stratiotes*, water lettuce (fam. Araceae) – large perennial fresh water plants floating on the water surface – are widely distributed in tropical and subtropical countries. For more than 10 years now they have been growing successfully and multiplying both vegetatively and through seeds in open water bodies of Uzbekistan in the hot period of the year.

Pistia grown on the waste waters from animal breeding complexes and factories for the primary treatment of kenaf and also from other industries gives a high increase in the weight of biomass – up to 1 kg/m^2 and more per day, which amounts to 1800-2700 tonnes of raw material or 90-135 tonnes of absolutely dry mass rich in useful substances from 1 ha of water surface per season (summer months). *Pistia* biomass, after its thermal treatment in a vitamin flour unit (AVM-0.65; AVM-1.5, etc.) has been recommended for use in a protein–vitamin and mineral supplement (5-10%) in the ration of agricultural animals and poultry [1].

The carbohydrates of these plants have not been studied previously. We have now investigated the qualitative and quantitative compositions of the polysaccharides (PSs) of *Eichhornia crassipes* and *Pistia stratiotes*.

The air-dry comminuted raw material was first treated with chloroform and methanol, and then, from the raw material residue by the method of [2], we successively isolated the water-soluble polysaccharides (WSPSs), the pectin substances (PcSs), and the hemicelluloses (HCs). The yields and qualitative compositions of the polysaccharides are given in Table 1.

All the PSs were found to contain uronic acids (UAs) as well as neutral sugars. In the WSPSs of the *Eichhornia* the predominating sugars were galactose, glucose, xylose, and arabinose, and in those of the *Pistia* they were galactose, glucose, mannose, and arabinose. In the pectins of both the *Eichhonia* and the *Pistia,* galactose, glucose, arabinose, rhamnose, and uronic acids predominated. The *Eichhornia* PcSs contained 1.38% of —O—CH_3 groups and the *Pistia* 2.09%: they belonged to the group of low-methoxyl pectins.

In the HCs the sugars were distributed almost uniformly, except for the fact that in the *Pistia* HCs glucose predominated, which enabled us to assign them to polysaccharides of the glucan type.

TABLE 1. Amounts and Monosaccharide Compositions of *E. crassipes* and *P. stratiotes*

Type of PSs	Yield of PSs, % on the air-dry weight	Monosaccharide composition						
		Gal	Glc	Man	Xyl	Ara	Rha	UA
				E. crassipes				
WSPSs	7.3	6.0	2.1	1.9	3.5	4.0	1.0	+
PcSs	4.9	6.6	3.6	1.0	Tr.	3.3	2.4	++
HCs	5.0	1.6	2.6	1.5	1.2	1.4	Tr.	+
				P. stratiotes				
WSPSs	4.1	19.0	6.3	3.6	1.0	5.9	1.3	+
PcSs	8.0	8.0	5.4	1.2	1.0	2.3	4.6	++
HCs	6.2	Tr.	21.6	1.5	1.7	1.0	1.1	+

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In the *Eichhornia* the predominating PSs were the WSPSs, and in the *Pistia* the HCs. These plants are rich in proteins, carbohydrates, lipids, vitamins, and various minerals, and their raw materials base enables polysaccharides to be obtained in satisfactory amounts.

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