

## BRIEF COMMUNICATIONS

USE OF AN EXTRACTION-PHOTOMETRIC METHOD IN THE QUANTITATIVE  
DETERMINATION OF AMINO SUGARS FOR INVESTIGATING NATURAL POLYMERST. I. Burtseva, S. A. Cherkasova,  
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We have previously proposed an extraction-photometric method of determining amino sugars in lipopolysaccharide preparations of bacterial origin which eliminates the influence of admixtures of amino acids and monosaccharides on the results of the analysis [1]. In the present communication we describe the application of the method for the analysis of the bioglycans from other sources.

Bioglycans isolated in the laboratories of the Pacific Ocean Institute of Bioorganic Chemistry of the Far Eastern Scientific Center of the USSR Academy of Sciences from materials of different natures and also lipopolysaccharides from microbial sources not studied previously were investigated (Table 1). All the preparations were analyzed by the extraction-photometric method and by the Elson-Morgan method [2]. The amounts of monosaccharides [3] and of protein [4] in the samples investigated were determined in parallel. In those cases where in a sample the amount of one of the components (monosaccharides or proteins) was low or the component was completely absent, the results of the extraction-photometric method approximated to or coincided with those obtained by the Elson-Morgan method [2]. When all the components were present in any ratios, the results of the Elson-Morgan analysis proved to be rather high.

In parallel, some of the samples were investigated on an amino acid analyzer [5]. The results of the analysis agreed in the main with those of the extraction-photometric method.

Thus, the extraction-photometric method for the quantitative determination of amino sugars that we developed previously for the analysis of bacterial preparations has also proved applicable to the analysis of bioglycans from other sources.

In all cases, the standard deviation for five determinations was not more than 4%.

TABLE 1. Determination of Amino Sugars in Biopreparations Isolated from Various Natural Sources

Preparation investigated	Found, %				
	monosaccharides	protein	amino sugars, found		
			by the extraction photometric method	by the Elson-Morgan method	on an amino acid analyzer
Trophoblastic $\beta_1$ -globulin from the serum of pregnant women	1,01	51,68	0,89 $\pm$ 0,035	0,91 $\pm$ 0,035	0,90 $\pm$ 0,03
Human $\alpha_1$ -acid glycoprotein	18,73	52,72	11,92 $\pm$ 0,37	25,8 $\pm$ 1,03	10,85 $\pm$ 0,25
PS-Protein complex from invertebrates:					
1. Urechis (viscera)	32,32	32,25	6,61 $\pm$ 0,19	15,32 $\pm$ 0,76	5,91 $\pm$ 0,20
2. Squid (viscera)	3,06	45,82	2,74 $\pm$ 0,08	6,81 $\pm$ 0,30	2,48 $\pm$ 0,09
Microbial sources:					
Yersinia kristensenii, LPS of serovar O:16,26	46,00	11,34	9,68 $\pm$ 0,35	15,9 $\pm$ 0,65	9,34 $\pm$ 0,30
Y. kristensenii, LPS of serovar O:12,26	44,54	16,78	1,43 $\pm$ 0,05	3,71 $\pm$ 0,25	1,68 $\pm$ 0,02
Y. intermedia, LPS (strain 680)	66,76	6,88	1,58 $\pm$ 0,06	3,3 $\pm$ 0,15	1,47 $\pm$ 0,03

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The method can be used in biochemical and medical laboratories of any class occupied with the investigation of bioglycans of different natures.

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#### POLYSACCHARIDES OF SAPONIN-BEARING PLANTS.

#### III. POLYSACCHARIDES OF THE EPIGEAL ORGANS OF *Biebersteinia multifida*

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We have reported previously on an investigation of the polysaccharides of the tuberous roots of *Biebersteinia multifida* DC [1]. We now give the results of an investigation of the polysaccharides (PSs) of the epigeal organs (stems, leaves, flowers) of this plant collected in the flowering phase.

The water-soluble polysaccharides (WSPSs) the pectin substances (PCs) and the hemicelluloses (HCs) were isolated and purified as described in [2]. The complete hydrolysis of the polysaccharides and the identification of the monosaccharides by GLC were carried out as in [3]:

Type of PS	Yield of PSs, % on the abs. dry weight	Gal	Glc	Man	Xyl	Ara	Rha	GalUA
WSPSs	7.2	15.0	22.5	16.9	1.0	11.7	2.6	Tr.
PCs	10.4	3.4	1.5	6.7	1.0	18.8	3.5	++
HCs	20.8	5.0	4.2	1.3	50.3	2.6	1.0	+

The results of the analysis show that PCs and HCs predominate in the epigeal organs of the plant, in contrast to the tuberous roots [1].

The polysaccharides gave a negative reaction with iodine for the presence of starch. Among the neutral sugars from the PCs arabinose predominated, and among those from the HCs xylose. This makes it possible to assign the HCs to polysaccharides of the xylan type.

The WSPSs were separated on DEAE-cellulose ( $-\text{CO}_3^-$ ) into neutral and acidic fractions. Elution with water gave 32% of a neutral polysaccharide (NPS), and elution with 1 M  $(\text{NH}_4)_2\text{CO}_3$  gave 65% of an acidic polysaccharide (APS) consisting of GalUA, Gal, Glc, Man, Xyl, Ara, and Rha. In the NPS, Gal, Glc, Man, Xyl, and Ara were detected in a ratio of 1.2:19.0:4.0:1.0:6.3, respectively.

Thus, water-soluble polysaccharides, pectin substances, and hemicellulose have been isolated from the epigeal organs of *Biebersteinia multifida* and characterized. Pectin substances and hemicellulose predominate in the epigeal organs of the plant, while polysaccharides

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