BRIEF COMMUNICATIONS

COMPONENTS OF THE FLOWERS OF A HYBRID HIBISCUS

A. A. Sadykov, A. I. Ismailov, and Kh. I. Isaev

UDC 547.915

The flavonoid compounds of the flowers of various species of Hibiscus, family Malvaceae, have been studied previously [1, 2]. We give the results of the isolation and identification of other classes of organic compounds from the flowers of the hybrid Hibiscus of variety No. 20 grown in the Botanical Garden of the Academy of Sciences of the Uzbek SSR [3] and collected in the phase of mass flowering (July-August).

Extraction was carried out with chloroform, the solvent was distilled off, and the residue was separated into acetone-insoluble (A) and acetone-soluble (B) fractions.

Fraction A was treated repeatedly with petroleum ether (with heating). The petroleum ether extract was passed through a column filled with alumina. The column was washed successively with benzene, ether, acetone, and methanol. The petroleum ether eluate yielded by recrystallization from acetone a number of crystalline substances, identified on the basis of GLC with markers as the following high-molecular-weight hydrocarbons (% on the total): tritriacontane 14.8; tetratriacontane 13.7; pentatriacontane 11.9; dotriacontane 9.9; hentriacontane 9.6; hexatriacontane 7.7; heptatriacontane 7.4; octatriacontant 5.6; triacontane 5.1; nonacosane 4.6; nonatriacontane 3.9; tetracontane 1.9; octacosane 1.7; heptacosane 1.3; hentetracontane 0.8.

We used a Hitachi model K-53 chromatograph with a dual flame-ionization detector. Conditions of chromatographic analysis: stationary liquid phase – SE-30 (10% on the weight of the solid support, silanized Chromosorb W with a particle size of 60-80 mesh), column length 1 m, internal diameter 3 mm, evaporator temperature 350°C, column temperature 280°C, rate of heating 5°C/min, carrier gas helium.

From the benzene and methanol eluates we isolated crystalline substances with mp 77-78°C and 80-81°C (melting points of the acetyl derivative 62-64°C and 66-67°C, respectively), which were identified as the high-molecular-weight alcohols hexacosanol and octacosanol [4]. Fraction B was subjected to saponification. From the unsaponifiable part after separation on a column of alumina we isolated a crystalline substance with mp 137-138°C having the composition $C_{29}H_{50}O$.

On the basis of its IR spectrum (3437, 1672 cm^{-1}), the preparation of some derivatives (acetyl derivative with mp 129-130°C, benzoyl derivative with mp 145-146°C) and a mixed melting point, the substance was identified as β-sitosterol, which has been isolated from the cotton plant [5].

After the separation of the β-sitosterol, the resinous product was acetylated and by means of GLC it was shown to contain hexadecanol and octadecanol.

From the saponifiable fraction after acidification we isolated fatty acids which were characterized by reversed-phase partition chromatography as myristic, palmitic, stearic, oleic, linolenic, and arachidic acids [6]. Their detection only after saponification of the extracts shows the presence of these acids in the bound form.

LITERATURE CITED

1. K. S. Pankajamanu and T. R. Seshadri, Proc. Indian Acad. Sci., 37A, No. 6, 93 (1953).
2. B. Maksudova, Z. P. Pakudina, and A. S. Sadykov, Khim. Prirodn. Soedin., 11 (1967).
3. F. N. Rusanov, Hybrid Hibiscuses [in Russian], Tashkent (1953).
4. A. S. Sadykov, Kh. I. Isaev, and A. I. Ismailov, Uzb. Khim. Zh., No. 2, 53 (1963).

Department of Bioorganic Chemistry of the Academy of Sciences of the Uzbed SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 412-413, May-June, 1977. Original article submitted February 4, 1977.

5. Kh. L. Isaev, A. L. Ismailov, and A. S. Sadykov, Scientific Proceedings of Tashkent State University, No. 286, The Chemistry of Plant Substances, II [in Russian], Tashkent (1966), p. 33.
6. N. L. Iskhakov and A. S. Sadykov, Dokl. Akad. Nauk UzSSR, No. 4, 30 (1964).

WATER-SOLUBLE POLYSACCHARIDES FROM THE BULBS OF PLANTS OF THE GENUS Ungernia

D. A. Rakhimov, G. Mutalshaikhov, and Z. F. Ismailov

UDC 547.917

Plants of the genus Ungernia Bunge (family Amaryllidaceae) are represented in Central Asia by seven species [1]. There are reports on the determination of the amounts of mucilages, pentosans [2], and pectin substances [3] in some species of Ungernia. We have investigated the amounts of water-soluble polysaccharides (PSs) in the bulbs of seven species of Ungernia by a method described previously [4]:

Plant	Place and date of collection	Amt. of PSs, % on the weight of the air-dry raw material
U. ferganica Vved.	KirgSSR, Dzhalalabad oblast, gorge of the R. Kugart, May 22, 1974.	10,1
U. oligostroma M. Pop. et Vved.	Chimkent oblast, environs of the village of Abai, May 20, 1970.	11,7
U. sewertzovii (Regel) B. Fedtsch.	Tashkent oblast, gorge of the R. Galvasai, June 20, 1970.	10,9
U. spiralis Praskor.	TurkmenSSR, Karakalinskii region, May 20, 1973.	8,1
U. tadshikorum Vved.	TadzhSSR, gorge of the R. Kafirnigan, village of Chinar, June 20, 1973.	9,0
U. trisphaera Bunge	TurkmenSSR, environs of the village of Baba-Durmez, May 27, 1973.	8,6
U. victoris Vved.	TadzhSSR, gorge of the R. Khanaka, April 15, 1973.	10,8

The samples of PSs consisted of white fibrous powders soluble in water and solutions of alkalis. Hydrolyzates of the samples were found to contain mainly mannose, a small amount of glucose, and traces of galactose. The PSs from the bulbs of U. oligostroma were studied in detail. The IR spectrum of the initial PS showed absorption bands at 1740 and 1260 cm^{-1}, the product obtained by purification via the copper complex did not have these bands. In view of this, the assumption arose of the presence of acetyl groups readily hydrolyzed by alkali in the PSs, and O-Ac groups were identified by the method of Igamberdieva et al. [5] and by GLC.

Gel filtration of the initial polysaccharide on a column of G-100 showed its polydispersity. From an aqueous solution of the PSs by precipitation with ethanol we obtained five fractions, of which three, with a yield of 68.6%, gave a single peak on gel filtration and ultracentrifugation. In the products of acid hydrolysis mannose and traces of glucose were found by the PC method, and their ratio was determined as 550:1 by GLC. D-Mannose was identified in the form of the phenylhydrazone and of methyl α-D-mannopyranoside. This shows that the PS is a homopolysaccharide. We have called it ungeromannan-O.

Ungermannan-O contains 8.2% of O-Ac groups, and on deacetylation it becomes insoluble in water. The weight-average molecular weight calculated from a calibration curve corresponds to 53,000 carbon units. The results of a study of the viscosity of a solution (0.2 g/100 ml) have been expressed in the form of the relative viscosity ($\eta_{rel}=5.81$), the specific viscosity ($\eta_{sp}=4.81$), and the reduced viscosity ($\eta_{red}=24.05$). The high value of η_{red} at a low concentration is evidence in favor of a fibrillar structure [6] of the ungeromannan-O molecule, which differs in its properties from known mannans [7-10]. The results of a study of the PSs of the

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 413-414, May-June, 1977. Original article submitted February 15, 1977.