from the fern spores was close to that in the waxes of higher plants, and that from the pine pollen and the Chenopodiaceae pollen was close to that of the lipids of marine organisms.

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POLYSACCHARIDES OF Achillea asiatica

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UDC 547.917

The yarrow Achillea asiatica Serg., family Asteraceae, is a valuable medicinal and essential-oil plant. Its herbage and inflorescences are the source of a wound-healing preparation [1].

We have investigated the polysaccharide complexes (PSCs) from the herbage of the yarrow collected in the flowering phase in Tomsk province, and also that from the meal after the extraction of the essential oil from the herbage [2]. In addition, we used herbage and meal that had been extracted twice with chloroform at room temperature. The polysaccharides extracted from the raw material with hot water (95°C, 2 h) were investigated, the PSCs being precipitated with ethanol.

The amounts of PSCs (% on the weight of the air-dry raw material) and their qualitative compositions are given below:

Object of investigation	Yield of PSCs	Amounts in the PSCs, % neutral sugars	including free sugars
Herbage	2.60	24.90	0.21
Meal	7.85	36.80	0.27
Chloroform-purified:			
herbage	3.70	21.25	0.27
meal	9.05	36.40	0.24

The greatest yield of PSCs was obtained from the meal. Purification with chloroform also increased the yield of PSCs. The greatest amount of neutral sugars was present in the PSCs from the meal (36.80%). Previous treatment of the raw material and the meal with chloroform did not appreciably change the amounts of neutral sugars in the PSCs.

We then studied the PSCs from the purified raw material. The PSCs consisted of pulverulent substances soluble in water and insoluble in organic solvents. The PSCs contained

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no starch, as was shown by the negative reaction with iodine. The product of the acid hydrolysis of the PSCs from the herbage was found by PC and GLC [3] to contain galacturonic acid, Rha, Ara, Xyl, Man, Glc, Gal, and an unidentified sugar in a ratio of 7.3:8.9:3.6:8.9:19.4:49.4:1, respectively. In the PSCs from the meal, GalUA and the same sugars were detected in a ratio of 16.3:28.0:4.3:3.8:12.5:35.5:1. Gal and Glc predominated in the PSCs from the herbage and Gal and Ara in the PSCs from the meal.

Then, with the aim of purification and separation, the PSCs from the meal (2 g in 25 ml of H_2O) were chromatographed on DEAE-cellulose ($-CO_3^{2-}$) with elution successively by water, 1 M $(NH_4)_2CO_3$, and 0.2 N NaOH. The aqueous eluates were evaporated to a syrup and precipitated with ethanol. The yield of the neutral fraction was 12%. In a hydrolysate, Rha, Ara, Xyl, Man, Glc, and Gal were detected in a ratio of 1:11.6:2.4:1.7:10:19.6. The alkaline eluates were dialyzed against water and precipitated with ethanol. The yield of acidic polysaccharide obtained by elution with 1 M $(NH_4)_2CO_3$ was 23%, and in a hydrolysate GalUA and Rha, Ara, Xyl, Man, Glc, Gal, and an unidentified sugar were detected in a ratio of 11:10:2.4:2:2.4:13.2:1.

The polysaccharides eluted by 0.2 N sodium hydroxide (43%) consisted of Gal and GalUA, traces of Ara, Xyl, and Man also being detected.

Thus, the herbage and meal of Achillea asiatica contain PSCs. They differ with respect to the amounts of individual sugars. The PSCs include neutral and acidic polysaccharides.

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PHYSIOLOGICAL ACTIVITY OF DITERPENOIDS FROM THE SOFT CORAL Sarcophyton trocheliophorum

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We have established that hexane extracts of the soft coral Sarcophyton trocheliophorum, which is widely distributed in the tropical zone of the world ocean and specimens of which were collected in the Seychelles Islands during the expedition of the Scientific Research Vessel Professor Bogorov, contain new cembrene alcohols – 13-hydroxyneocembrene [(1R,3E,7E,11E,13S)cembra-3,7,11,15-tetraen-13-ol] (IV), 0.25% yield calculated on the weight of lyophilized raw material: 11,12-epoxy-13-hydroxyneocembrene [(1R,3E,7E,13S)-11,12-epoxycembra-3,7,15-trien-13-ol] (II), 0.4% yield calculated on the weight of the lyophilizate; and the known diterpene-hydrocarbon neocembrene (I), 0.001%. The structures of the diterpenoids investigated were shown on the basis of an analysis of physicochemical characteristics (see scheme on following page).

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