POLYPHENOLIC COMPOUNDS OF MILK VETCHES OF THE FLORA OF THE WESTERN PAMIR. III.

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We have previously given an account of polyphenolic compounds of some plants of the genus Astragalus L. growing in the Northern Caucasus and in Uzbekistan [1-3]. Continuing a study of the composition of the polyphenolic compounds, we have investigated the milk vetches Astragalus tectimundi Freyn and A. peduncularis Royll.

The epigeal part of A. techimundi was collected in the flowering phase in the region of the village of Shoshbulat at a height of 3250 m, and A. peduncularis in the village of Tussion, Shuganshii raion, Gornyi Badakhshan, at a height of 3000 m.

The air-dry raw material (500 g) was treated with chloroform to eliminate lipophilic substances and was then extracted exhaustively by heating with 70% ethanol. The extract was evaporated to one-third of its initial volume and was washed with chloroform and extracted successively with ethyl acetate and n-butanol.

With the aid of column chromatography on a polyamide sorbent (with water containing increasing concentrations of ethanol as eluent) the ethyl acetate fraction of A. tectimundi yielded four compounds.

Substance (I) – yellow crystals, mp 190-191°C (aqueous ethanol) was identified from the results of acid hydrolysis and UV and IR spectroscopy as rutin.

Substance (II) – light yellow crystals, mp 178°C. On acid hydrolysis it formed D-glucose and kaempferol. According to the results of UV spectroscopy in the presence of ionizing and complex-forming additives and of IR spectroscopy, it was kaempferol 3-β-D-glucopyranoside (astragalin).

Substance (III) was identified as quercetin.

Substance (IV) – yellow crystals. UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 361, 258; $+CH_3COONa$: 367, 269; $+AlCl_3$: 402, 359, 270; $+AlCl_3$ + HCl: 402, 354, 301, 267; $+CH_3COONa + H_3BO_3$: 375, 265 nm. It did not undergo acid hydrolysis. Its R_f value in five different systems corresponded to those of 3-methylquercetin.

The chromatography of a butanolic fraction from the same plant (under the same conditions) yielded two compounds:

Substance (V) – light yellow crystals, eluted by 40% ethanol, mp 173°C. According to UV spectroscopy and color reactions it contained no free hydroxy groups at C-3 and C-7. On complete acid hydrolysis it formed quercetin and D-glucose. It gave no depression of the melting point in admixture with quercetin 3,7-diglucopyranoside.

Substance (VI) was eluted from the column by 45% ethanol. On acid hydrolysis it formed the aglycon 3-O-methylquercetin and D-glucose. According to the results of UV spectroscopy, the glucose residue was present at the C-7 position, and the compound isolated was 3-O-methylquercetin 7-O-β-D-glucopyranoside.

With the aid of gel filtration through Molselekt (elution with water and 5% ethanol), Astragalus peduncularis yielded two compounds, which were identified as rutin and isoquercitrin.

Caffeic acid was detected in both Astragalus species.

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CHEMICAL COMPOSITION OF A PHENOL-POLYSACCHARIDE PREPARATION OF PROPOLIS

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Propolis is a natural product with a complex chemical composition elaborated by bees. The biological activity of this product has permitted its wide use in human and veterinary medicine [1].

The isolation of biologically active fractions from propolis and their detailed chemical analysis are necessary for answering the question of the dependence of the therapeutic activity of this product on its composition and the creation of medicinal forms with a directed action from it.

We have studied a phenol-polysaccharide preparation of propolis obtained from crude propolis after it had been freed from waxes. Qualitative reactions showed the presence of phenolic compounds and polysaccharides in the preparation. We have examined its macro- and microelement composition.

Individual substances were isolated by preparative paper chromatography in 2% acetic acid solution with elution by 95% ethanol. On the basis of qualitative reactions, UV spectroscopy, and R_f values in various solvent systems and also of a direct comparison with authentic samples [2, 4], seven substances were identified in the preparation: five hydroxycinnamic acid derivatives (caffeic, ferulic, chlorogenic, enochlorogenic, and coumaric acids and two hydroxycoumarin derivatives (esculetin and scopoletin).

The total amount of phenolic compounds in the phenol-polysaccharide preparation of propolis was determined spectrophotometrically in a cell with a layer thickness of 10 nm at a wavelength of 290 nm [5], since the UV spectrum of an alcoholic solution of the spectrum had an absorption maximum in this region. It amounted to 30-40%.

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