D-galactose — were found in the product of enzymatic hydrolysis. The results of enzymatic hydrolysis showed that the sugar component was attached to the aglycone by a β-glycosidic bond. These results were confirmed by differential IR spectroscopy.

Glycoside C was identified as 3,4',5,7-tetrahydroxyflavone 3-O-β-D-galactopyranoside (trifolin).

Substance D — $C_{15}H_{10}O_7$, mp 310-313°C; λ_{max} 256, 370 nm (ethanol).

Substance E — $C_{15}H_{10}O_6$, mp 257-277°C; λ_{max} 370, 296, 265 nm (ethanol).

Substance F — $C_{16}H_{12}O_4$, mp 255-257°C; λ_{max} 300, 250 nm (ethanol).

The results of physicochemical study and also mixed melting points permitted substances D, E, and F to be characterized as quercetin, kaempferol, and formononetin, respectively.

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COUMARINS OF *Heracleum asperum*

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We have studied the coumarins of the roots of *Heracleum asperum* M. B. [∿ scabrous cow parsnip], endemic in the Caucasus, collected at the forest edge in the Buinaksk district, Daghestan ASSR, in September 1977 [1]. From the roots we have isolated piminellin, isobergapten, bergapten, and sphondin [2-4].

From an ethanolic extract of the roots of the plant (747 g) after the solvent had been distilled off, a resin was obtained (98.1 g), which was mixed with chloroform. The insoluble part (17.9 g), after treatment with ethanol and standing, deposited a crystalline substance of noncoumarin nature with mp 176°C (from ethanol). The part of the resin that had dissolved (80.2 g) was chromatographed on a column [5]. The substances were eluted with gasoline (400 ml) and with gasoline—chloroform (2:1) (500 ml). After the solvent had been distilled off from the gasoline eluates pimpinellin (0.64%) was isolated, and the eluates obtained when the column was eluted with gasoline—chloroform yielded isobergapten, bergapten, and sphondin.

The substances obtained were identified with authentic compounds from the results of IR spectroscopy, melting points and R_f values on paper chromatography with markers [2-4, 6]. In addition to the furocoumarins mentioned, the presence of osthole in the roots was detected by paper chromatography.

According to the literature [2-4], from the root of the same plant growing in the Kazbek district of the Georgian SSR, osthole, isobergapten, bergapten, and sphondin have been isolated, and psoralen, angelicin, imperatorin, and pimpernellin have been detected by paper chromatography.

The coumarin composition of the roots of *H. asperum* endemic in the Caucasus depends on its growth site and the time of collection of the plant material.

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COUMARINS OF *Ptarmica bisserata*

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In a study of the epigeal part of *Ptarmica bisserata* (Bieb.) DC. (*Achillea bisserata* M.B.), family *Compositae*, cultivated in the botanical garden of the Stavropol' Pedagogic Institute, we have detected a number of substances of coumarin nature. In order to isolate them, the comminuted epigeal part was extracted with 80% ethanol, and the extract obtained was concentrated in vacuum to an aqueous residue which was treated with chloroform.

The residue after the chloroform has been driven off was deposited on a column of silica gel. The following solvent systems were used for elution: 1) benzene—ethyl acetate (2:1); and 2) butan-1-ol—CH_3COOH—H_2O (4:1:5).

The fractions obtained were purified by preparative chromatography in a thin layer of silica gel in the above-mentioned solvent systems. Two compounds were isolated in the individual form.

Substance I — $C_{10}H_8O_4$, yellowish crystals, mp 204-205°C. UV spectrum, $\lambda_{max}^{C_2H_5OH}$, nm 229, 254, 298, 354. IR spectrum, ν_{max}^{KBr}, cm^{-1}: 1710 (C=O), 1613, 1570 (C=C), 3045 (OH). From its physicochemical properties, compound (I) was identified as scopoletin [1].

Substance (II) — $C_{16}H_{18}O_9$, mp 217-219°C, proved to a glycoside. R_f 0.41 in system 2.

When it was hydrolyzed with 10% H_2SO_4 for 3 h, scopoletin and D-glucose were found in the hydrolysate. The compound obtained is scopoletin 7-glucoside, i.e., scopolin [2].

This is the first time that coumarins have been obtained from this plant.

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