Substance (II) had the composition $C_{30}H_{56}O_{13}$, mp 206-209°C, $[\alpha]_D^{20}$ + 24 ± 2° (c 0.5; methanol). Acid hydrolysis with 0.01% sulfuric acid led to the formation of periplogenin [$C_{23}H_{34}O_9$, $[\alpha]_D^{20}$ + 28.0° (c 0.3; methanol)], D-glucose and D-cymarose. Enzymatic cleavage yielded periplocymarin [$C_{30}H_{46}O_9$, $[\alpha]_D^{20}$ + 28.0° (c 0.3; methanol)], and D-glucose.

On the basis of its conversion products and a mixed melting point, substance (II) was identified as periplocin (II).

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COUMARINS OF *Ptarmica impatiens* AND *P. ptarmicifolia*

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Continuing a study of plants of the genus *Ptarmica*, family Asteraceae [1, 2], we have investigated the coumarins of *Ptarmica impatiens* DC (*Achillea impatiens* L.) collected in the flowering period in the Altai krai in August, 1981.

The air-dry epigeal part was extracted with 80% ethanol. The resulting extract was concentrated in vacuum to an aqueous residue, which was treated with hexane, and with chloroform. The chloroform extract, after the solvent had been distilled off, was deposited on a column of silica gel. Elution was performed with the following solvent systems: 1) hexane—ethyl acetate (9 : 1); 2) butan-1-ol—CH_3COOH—H_2O (4 : 1 : 5). Three compounds were isolated in the individual state.

Substance (I), composition $C_{11}H_{10}O_4$, formed colorless crystals with mp 144-146°C. UV spectrum, $\lambda_{max}^{C_2H_5OH}$, nm: 229, 295, 343. IR spectrum, ν_{max}^{KBr}, cm^{-1}: 1720 (C=O), 1620, 1560, 1520 (C=C). The substance was identified as scoparone [3].

Substance (II), with the composition $C_{10}H_8O_4$, mp 204-205°C, formed pale yellow crystals. UV spectrum, $\lambda_{max}^{C_2H_5OH}$, nm: 230, 254, 298, 346. IR spectrum, λ_{max}^{KBr}, cm^{-1}: 1720 (C=O); 1613, 1570 (C=C); 3045 (OH group). The compound isolated was identified as scopoletin. [3].

Substance (III), with the composition $C_{16}H_{18}O_9$, formed colorless crystals with mp 217-219°C, and proved to be a glycoside; R_f 0.42 in system 2. The hydrolytic cleavage of the glycoside with 5% H_2SO_4 led to scopoletin and D-glucose. Substance (III) was therefore scopoletin 7-glucoside, i.e., scopolin.

The coumarins scoparone and scopoletin were also isolated from the epigeal part of *Ptarmica ptarmicifolia* (Willd.) G. [*Achillea ptarmicifolia* (Willd.)] collected in the flowering period in the central Caucasus in August. The substances were identified as known compounds from the results of UV and IR spectroscopy, melting point determinations, and a comparison with authentic samples.

Continuing the further study [1, 2] of *Ptarmica bisserata* (Bieb) DC. (*Achillea bisserata*, M. B.), endemic for the Caucasus, from a hexane extract we have isolated an acid with mp 94°C (ethanol), having the composition $C_{30}H_{60}O_2$, M^+ 452. According to its IR and mass spectrum, this compound belonged to the acyclic saturated organic monobasic acids of normal structure and it is in fact melissic acid [4].

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FLAVONOIDS FROM *Ammothamnus lehmannii*

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We have previously isolated phenolic acids from the plant *Ammothamnus lehmanni* Bge [1]. Continuing our investigation, from an ethyl acetate fraction of an alcoholic extract of the epigeal part of the plant collected in the flowering period in the Kenimekh region of Navoi province (close to the village of Kokcha), we have isolated another five flavonoids by column chromatography on silica gel with elution by chloroform–ethanol in various ratios.

Substance (I) with mp 328-331°C, M^+ 286 (acetate with mp 225-226°C) and substance (II) with mp 312-315°C, M^+ 302 (acetate with mp mp 196-198°C) were identified on the basis of IR, UV, PMR, and mass spectra and also by comparison with authentic samples, as luteolin and quercetin, respectively, [2, 3].

Substance (III) had mp 252-254°C, $[\alpha]_D^{20} - 40.8°$ (c 1.0; dimethylformamide). Acylation formed a heptaacetate with mp 122-124°C and acid hydrolysis led to luteolin and D-glucose.

On the basis of IR, PMR, and UV spectra with ionizing and complex-forming reagents, and also by direct comparison with an authentic sample, (III) was identified as luteolin 7-O-β-D-glucopyranoside (cynaroside) [3].

Substance (IV), with mp 226-229°C, $[\alpha]_D^{20} - 52°$ (c 0.4; methanol), on acid and enzymatic hydrolysis, gave quercetin and D-glucose. On the basis of IR and UV spectra and a comparison with the product obtained in the partial hydrolysis of rutin, this flavonoid was identified as quercetin 3-O-β-D-glucopyranoside (isoquercitrin).

Substance (V), with mp 194-197°C, $[\alpha]_D^{20} - 33.5°$ (c 0.2; methanol). Acid hydrolysis with 5% sulfuric acid formed quercetin, D-glucose, and L-rhamnose. On the basis of the results of UV, IR, and PMR spectroscopy and the production of quercetin on enzymatic hydrolysis with rhamnodiastase, and also by direct comparison with a authentic sample, compound (V) was identified as rutin [4].

This is the first time that these flavonoids have been isolated from *Ammothamnus lehmannii* Bge.

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