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COUMARIN DERIVATIVES FROM THE EPIGEAL PART OF *Heracleum grandiflorum*

D. M. Akhmedov and S. V. Serkerov

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Representatives of the genus *Heracleum* (cow parsnip; fam. Apiaceae) are characterized by their content of coumarin derivatives. One of the species of this genus, *Heracleum grandiflorum* Bieb., which grows in Azerbaidzhan, has not previously been investigated in the chemical respect. We have now studied the coumarins of the epigeal part of this plant gathered in the flowering period (at the beginning of August) in the environs of the village of Generchai, Kusary region, Republic of Azerbaidzhan.

The air-dry comminuted plant material was extracted three times with acetone. The extract was filtered and evaporated. The residue — a dark green resin — was chromatographed on a column (3.5 × 70 cm) of silica gel LS 5/40 μm. As a result of elution with a previously described [1] sequence of solvents and repeated rechromatography, nine substances of coumarin nature were isolated in the individual state:

1) $C_9H_6O_3$, mp 231-233° (needles from water); ν_{max}: 3200, 1700, 1680, 1635, 1580, 1520 cm^{-1};
2) $C_{10}H_8O_4$, mp 203-204° (yellow needles from chloroform); ν_{max}: 3250, 1710, 1625, 1600, 1580, 1520 cm^{-1};
3) $C_{11}H_6O_3$, mp 162-163° (needles from water); ν_{max}: 1725, 1675, 1630, 1603, 1580, 1540 cm^{-1};
4) $C_{12}H_8O_4$, mp 187-189° (sublimation); ν_{max}: 1720, 1682, 1630, 1613, 1580, 1530 cm^{-1};
5) $C_{12}H_8O_4$, mp 144-145° (prisms from aqueous ethanol); ν_{max}: 1713, 1625, 1582, 1535 cm^{-1};
6) $C_{13}H_{10}O_5$, mp 117-119° (needles from ethanol), ν_{max}: 1725, 1632, 1578, 1530 cm^{-1};
7) $C_{13}H_{10}O_5$, mp 149-150° (pale yellow needles from ethanol); ν_{max}: 1738, 1620, 1635, 1540 cm^{-1};
8) $C_{14}H_{14}O_4$, mp 188-190° (needles from chloroform–hexane); ν_{max}: 3470, 1710, 1623, 1572, 1520 cm^{-1};
9) $C_{14}H_{14}O_4$, mp 155-157° (chloroform–hexane); ν_{max}: 3415, 1722, 1625, 1583 cm^{-1}.

A direct comparison of the IR spectra of substances (**1-9**) with the spectra of known coumarins identified them as umbelliferone, scopoletin, psoralen, bergapten, xanthotoxin, pimpinellin, isopimpinellin, marmesin, and columbianetin, respectively [2].

REFERENCES

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