COUMARINS OF SOME SPECIES OF THE GENUS Herniaria

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We have investigated the coumarin composition of Herniaria polygama J. Gay., H. auxina Klok, H. hirsuta L., H. suavis Klok, H. besseri Fisch., and H. glabra L. Alcoholic extracts of the first three species were found by paper chromatography in the chloroform–formamide system to contain not less than four substances, with R_f 0.90 (I), 0.69 (II), 0.42 (III), and 0.3 (IV), giving a bright-blue fluorescence after the treatment of the chromatograms with alkali. In the other species we found only substance II.

The isolation of the substances was carried out in the following manner. The comminuted epigeal part of the plants was extracted with ethanol, the solvent was eliminated by evaporation, and the residue was mixed with water and treated first with benzene and then with ethyl acetate. The benzene extract was concentrated to small volume and passed through a layer of alumina with subsequent elution by the same solvent. The eluate was evaporated and the residue was crystallized from ethanol. This gave substance I.

By a procedure described previously [1], the ethyl acetate extract gave substances II and IV. These substances were cleaved by hydriodic acid in liquid phenol and acetic anhydride at 125°C to give coumarin [2].

Substance I, $C_{10}H_8O_3$, mp 117-118°C, was identified on the basis of its physicochemical properties as herniarin (7-methoxyumbelliferone), and we obtained it by methylating substance IV (umbelliferone).

Substance II, $C_{10}H_8O_4$, mp 200-201°C, and substance IV, $C_9H_6O_3$, mp 232-233°C, were identified as scopoletin and umbelliferone, which we have previously isolated from several species of coronilla [1, 3].

The coumarin composition of H. glabra L. varied according to its provenance. Individual samples of this species contained herniarin (I) and umbelliferone (IV), in addition to scopoletin (II).

LITERATURE CITED

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