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IRIDOID GLYCOSIDES OF *Euphrasia pectinata*

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Continuing systematic investigations of the iridoid-containing plants of Armenia, we have studied the iridoid composition of *Euphrasia pectinata* Ten. (fam. Scrophulariaceae) [1], Armenian samples of which have not been analyzed previously.

The dried epigeal part of *E. pectinata* (0.2 kg) gathered in the flowering phase in the Sevan region of Armenia was exhaustively extracted with methanol. The extract was evaporated to dryness under reduced pressure, and a solution of the residue (36 g) in 100 ml of water was washed with benzene and ether and was extracted with chloroform–methanol (3:1). Evaporation of the extract left 11.35 g of resin, which was chromatographed on a column of silica gel with elution by mixtures of chloroform and methanol (the fraction were monitored by TLC on Silufol-254 plates in the ethyl acetate–chloroform–methanol–water (7:1:2:1) system, the spots being detected under UV light and with the benzidine reagent). The fractions eluted with chloroform–methanol (100:5) yielded 0.89 g of substance (**1**), and the (100:7) fractions 1.0 g of substance (**2**).

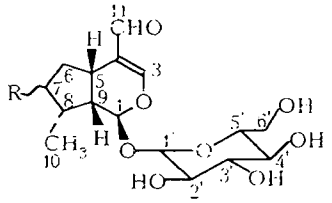
Substance (1), mp 100-102°C (from chloroform–methanol (100:2)), $[\alpha]_D^{20}$ −140° (methanol), R_f 0.48; acetyl derivative, mp 132-134°C, R_f 0.52 (in the benzene–acetone (8:2) system), $[\alpha]_D^{20}$ −110° (methanol). From its UV, IR, and ^1H and ^{13}C NMR spectra, compound (1) was identified as the iridoid boschnaloside [2, 3], not previously detected in the genus *Euphrasia*.

Substance (2), mp 167-169°C, $[\alpha]_D^{20}$ −132°C (methanol). R_f 0.37. PMR spectrum (D_2O, 0 — HMDS, δ, ppm): 9.27 (H-11, s), 7.45 (H-3, s), 5.77 (H-1, d, J = 2 Hz), 4.72 (H-1′, d, J = 7 Hz), 4.36 (H-7, br.s), 3.92-3.21 (H-2′, H-3′, H-4′, H-5′, 2H-6′, m), 2.97-2.95 (H-5, m), 2.76-2.74 (H-9, m), 2.68-2.64 (H-8, m), 1.84 (H-6β, m), 1.47 (H-6α, m), 1.14 (CH_3-8, J = 5.6 Hz).

^{13}C NMR spectrum (CD_3OD, δ, ppm): 97.69 (C-1, d), 165.13 (C-3, d), 123.94 (C-4, s), 33.65 (C-5, d), 42.19 (C-6, t), 76.60 (C-7, d), 42.25 (C-8, d), 41.45 (C-9, d), 16.89 (C-10, q), 193.50 (C-11, d), 100.22 (C-1′, d), 74.83 (C-2′, d), 78.62 (C-3′, d), 71.84 (C-4′, d), 78.24 (C-5′, d), 63.07 (C-6′, t).

The pentaacetyl derivative obtained from (**2**) with a mixture of pyridine and acetic anhydride at room temperature had mp 149-151°C, R_f 0.36 (in the benzene–acetone (8:2) system).

A comparative analysis of the ^1H and ^{13}C NMR spectra of substance (**2**) and known iridoids of the C-10 type [4] permitted the unambiguous assignment of the resonance signals given above and the ascription to substance (**2**) of the structure of the previously undescribed iridoid 7-hydroxyboschnaloside.



1. R=H
2. R=OH

No other iridoid glycosides were detected in the samples that we investigated. The fact that the results obtained differ from those known previously for *Euphrasia pectinata* [5] indicates the existence of a new chemorace of this plant.

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REFERENCES

1. A. L. Takhtadzhyan, The Flora of Armenia [in Russian], Akad. Nauk ArmSSR, Erevan, Vol. 8 (1987).
2. J. Ozaki, S. Johne, and M. Hesse, Helv. Chim. Acta, **62**, 2708 (1979).
3. O. Sticher and O. Salama, Helv. Chem. Acta, **64**, 78 (1981).
4. V. A. Mnatsakanyan, Iridoid Glycosides [in Russian], Akad. Nauk ArmSSR, Erevan (1986).
5. A. V. D'ogot', V. I. Litvinenko, N. O. Chernykh, and I. G. Zoz, Farm. Zh. **27**, No. 1, 66 (1972).