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IRIDOIDS OF *Scrophularia leucoclada* PLANTS

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Continuing a study of plants growing in Uzbekistan, we have investigated for the first time the iridoid content of the epigeal part of *Scrophularia leucoclada* (fam. Scrophulariaceae) gathered in ravines in the environs of the village of Derbent, Surkhandar'inskaya Oblast.

The air-dry comminuted raw material (1 kg) was extracted at room temperature with methanol (5 × 6 liters). The extract was concentrated, the residue was diluted with water, and the resulting precipitate was removed. The aqueous solution was extracted with chloroform and then with butanol. Elimination of the butanol by distillation left a dry residue consisting of 71 g of iridoids. A sample of this material (1.5 g) was chromatographed on a column of silica gel in the chloroform–methanol–water (4:1:0.1) system, and iridoids (**1**) and (**2**) were isolated.

Substance (1), $C_{17}H_{26}O_{11}$, mp 154-156°C (from methanol), $[\alpha]_D^{22}$ −131.2°C (*c* 0.27; methanol).

PMR spectrum (400 MHz D_2O; (δ, ppm, J, Hz): 5.87 (H-1, s), 6.25 (H-3, d, J = 6.2), 4.79 (H-4, d, J = 6.2), 1.81 (H-7, d.d, J = 15; 3.4), 1.95 (H-7, br.d, J = 15), 2.65 (H-9, s), 1.23 (CH_3-10, s), 1.86 (3H, $OCOCH_3$, s), 4.54 (H^1, d, J = 7.0), 3.11-3.76 (6H; m, signals of the protons of a carbohydrate residue).

From its physicochemical constants and IR, UV, mass, and PMR and ^{13}C NMR spectra, substance (**1**) was identified as 8-O-acetylharpagide [1-3].

The acetylation of substance (**1**) with acetic anhydride in pyridine under the usual conditions led to a pentaacetate $C_{27}H_{36}O_{16}$, mp 174-175°C (from methanol), the PMR spectrum of which had the following characteristics (300 MHz, C_5D_5N, 0 — TMS), δ, ppm, J, Hz): 6.47 (H-1, br.s), 6.55 (H-3, d, J = 6.4), 5.21 (H-4, br.d, J = 6.4), 5.29 (H-6, br.d, J = 4.7), 2.38 (1H-7, d, J = 15.4), 3.32 (H-9, br.s), 1.54 (CH_3-10, s), 5.46 ($1H^1$-1, d, J = 8.2), 4.33 (1H-6′, br.d, 12.5), 4.72 (1H-6′, d.d, J = 4.7, 12.5), 1.88, 2.03, 2.04, 2.08, 2.14 (6 × $OCOCH_3$, s).

Substance (2), $C_{15}H_{24}O_{10}$, amorphous, $[\alpha]_D^{20}$ −155.2° (*c* 0.32, methanol). A comparison of its physicochemical constants and spectral characteristics with those given in the literature [2-4] enabled it to be identified as harpagide.

To confirm the structure of iridoid (**2**), we subjected (**1**) to alkaline saponification, and in the neutral fraction we detected an iridoid identified as harpagide (**2**) [3].

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