PHYTOECDYSONES OF Rhaponticum integrifolium

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The air-dry inflorescences (5 kg) of Rh. integrifolium C. Winkl., family Compositae collected at the end of flowering (Tadzhik SSR, Darvazskii range, environs of the village of Saed) were extracted with 50 liters of methanol. After evaporation of the solvent, 360 g of a viscous resinous mass of extractive substances was obtained. According to TLC [SiO_2, chloroform–methanol (4:1)], the extract contained at least four phytoecdysones. Part of the total extract (230 g) was dissolved in 600 ml of methanol–water (2:1), and the hydrophobic compounds were extracted with benzene. The aqueous methanolic fraction was extracted with ethyl acetate. By chromatography on silica gel with elution by chloroform–methanol (9:1), the ethyl acetate extract yielded 3.2 g (0.10%) of a crystalline phytoecdysone, $C_{27}H_{44}O_7$, mp 235-236°C (ethyl acetate–methanol), $[\alpha]_D^{20}+62.3°$ (c 1.54; CH_3OH); $\lambda_{max}^{C_2H_5OH}$ 244 nm (log ε 4.05); ν_{max}^{KBr} 3370-3520 (OH), 1660 (COCH C=) cm^{-1}. NMR spectrum at 100 MHz (C_5H_5N, internal standard HMDS, δ, ppm): 0.94 (3 H at C_{19}, s); 1.09 (3 H at C_{18}, s); 1.44 (3 H at C_{21}, s); 1.24 (6 H at C_{26} and C_{27}, s); 6.02 (H at C_7). The mass spectrum (175°C, 40 ev) of the phytoecdysone isolated showed the presence of ions with m/e 462, 444, 426, 411, 408, 363, 345, 327, 309, 300, 99 and 81.

Consequently, on the basis of the facts given, the phytoecdysone described can be identified as ecdysterone [1]. The identity of the substance obtained with ecdysterone was also confirmed by the results of a direct comparison.

This is the first time that phytoecdysones have been found in plants of the genus Rhaponticum. Ecdysones have been found previously in the family Compositae in plants of the genus Serratula [2, 3].

LITERATURE CITED

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