FLAVONOIDS OF Ferula assafoetida

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UDC 547.972

The fruit of Ferula assafoetida L., family Umbelliferae (asafetida giantfennel) collected in the Chimkent oblast was extracted with methanol. The residue after the distillation of the solvent was dissolved in water, purified with chloroform, and extracted with ether and ethyl acetate.

Elimination of the ether and recrystallization from ethanol gave compound (I), $C_{15}H_{12}O_6$, mp 325-329°C, yield 0.05%, R_f 0.73 [Silufol plate, toluene–ethyl acetate–ethanol (2 : 1 : 1)], λ_{max}^{MeOH} 255, 268 sh., 352 nm, λ_{max}^{MeOAc} 269 nm. The NMR spectrum of the trimethylsilyl ether [1] had the signals of six protons, the chemical shifts and coupling constants of which were characteristic for 3',4',5,7-substituted flavone. Thus, compound (I) is luteolin.

From the ethyl acetate extract by recrystallization from aqueous ethanol was isolated compound (II), $C_{21}H_{20}O_{11}$, mp 232-234°C, $[\alpha]_D^{20}$ −60° (c 0.7; formamide), yield 0.5%, R_f 0.38. Hydrolysis (10% HCl, 100°C, 3h) gave equimolar amounts of D-glucose and luteolin with mp 319-323°C. The absence of changes in the UV spectrum of (II) (λ_{max} 257, 268 sh., and 352 nm) on the addition of sodium acetate (λ_{max} 259 nm) shows the attachment of the glucose residue to the 7–OH of the aglycone, as was also confirmed by the NMR spectrum of the silyl derivative of (II) (100 MHz, TMS, δ scale). The signals of the aromatic protons of (II) and (I) were practically identical, and in the 3-5-ppm region in the case of (II) the signals of seven glucose protons appeared (4.88, doublet, J = 6 Hz, 1H, and 3.28-3.72 ppm, multiplet, 6H). On the basis of the results obtained and those of a comparison with an authentic sample, compound (II) was identified as luteolin 7-O-β-D-glucopyranoside.

LITERATURE CITED

1. T. J. Mabry et al., The Systematic Identification of Flavonoids, Springer, New York (1970).

All-Union Scientific-Research Institute of Medicinal Plants. Translated from Khimiya Prirodnykh Soedinenni, No. 6, pp. 801-802, November, 1973. Original article submitted May 7, 1973.