TERPENOID COUMARINS OF *Ferula kokanica*.

M. V. Sklyar, M. G. Pimenov,
and L. B. Drozhzhina

UDC 547.9:582.80

Ferula kokanica Regel et Schmalh. — one of the widely distributed species in Central Asia — is found in the Pamir-Alai, and also in Afghanistan and Pakistan. It is considered to be a studied species, although partially as a source of coumarins. Galbanic acid [1], umbelliprenin and cocanikin [2] have been isolated from its roots. However, an attentive consideration of the paper [2] in which the origin of the material was described has forced us to doubt whether the species studied was in fact *F. kokanica*. The raw material was collected in the valley of Varzob, and "the roots had an unpleasant odor." However, the roots of *F. kokanica* have no specific odor. Of the giant fennels growing in the Varzob valley, such an odor is characteristic only of *F. eugenii*, which is very close to *F. violacea* We have studied both these species previously [3] and have isolated galbanic acid and umbelliprenin from them. Consequently, it is not excluded that under the name of *F. kokanica* [1, 2] raw material from *F. eugenii* or *F. violacea* were actually studied. In order to check this hypothesis, we have collected a weed-free sample of *F. kokanica* in the upper reaches of R. Zeravshan (Hissar Range).

Chromatography of an acetone extract of the roots of *F. kokanica* on silica gel L 40—100 μ in petroleum ether—ethyl acetate with subsequent rechromatography in methylene chloride—ethyl acetate yielded five terpenoid coumarins: (I) $C_{26}H_{32}O_5$, mp. 172-174°, $[\alpha]_D^{18}$ −35.3°; (II) $C_{24}H_{28}O_4$, mp 183-184°, $[\alpha]_D^{18}$ −36.7°; (III) $C_{24}H_{30}O_4$, mp 175-176°, $[\alpha]_D^{18}$ −51.2; (IV) $C_{24}H_{30}O_4$, mp 197-198°, $[\alpha]_D^{18}$ −62.2°; (V) $C_{24}H_{30}O_4$, mp 154-156°, $[\alpha]_D^{18}$ −52.3°. On the basis of the features of their PMR spectra and comparison with authentic samples [4-6], these substances were identified as badrakemin acetate (I) [4], badrakemone (II) [4], gummosin (III) [5], badrakemin (IV) [4], and farnesiferol A (V) [6].

Thus, the composition of *F. kokanica*, which contains terpenoid coumarins of the iresane series, differs sharply from that of the sample studied previously [1, 2]. The "chemical profiles" of these samples are dissimilar. The possibility of the presence of chemical varieties in the species cannot be completely excluded, but we nevertheless assume that it was probably a different species that was previously studied under this name.

LITERATURE CITED

1. N. P. Kir'yalov, Vestn. Akad. Nauk SSSR, No. 9, 77 (1959).
2. N. P. Kir'yalov, Tr. Bot. Inst. Aka. Nauk SSSR, Ser. 5, 8, 7 (1961).
3. I. A. Kir'yanova, Yu. E. Sklyar, M. G. Pimenov, and Yu. V. Baranova, Khim. Prir. Soedin., 134 (1978).
4. A. I. Sokolova, Yu. E. Sklyar, and M. G. Pimenov, Khim. Prir. Soedin., 134 (1978).
5. A. A. Savina, Yu. E. Skylar, and M. G. Pimenov, Khim. Prir. Soedin., 121 (1980).

M. V. Lomonosov Moscow State University. Botanical Garden, Moscow. All-Union Scientific Research Institute of Medicinal Plants, Moscow. Translated from Khimiya Prirodnykh Soedinenii No. 6, pp. 778—779, November-December, 1982. Original article submitted June 15, 1982.

0009-3130/82/1806-0743$07.50