

ESTERS OF *Ferula tatarica*

N. N. Nazhimutdinova, A. I. Saidkhodzhaev,
and V. M. Malikov

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Continuing an investigation of the terpenoid compounds of the plant genus *Ferula* L. (Fam. Apiaceae) we have studied the esters of *Ferula tatarica* Fiach ex Spreng. This species belongs to the subgenus *Peucedonoides*, representatives of which are extremely nonuniform in their terpenoid content; i.e., within the limits of the subgenus there are *Ferula* species containing terpenoid coumarins, sesquiterpene lactones, and esters of terpenoid alcohols.

The raw material for the investigation was gathered in the Bukhara province of the Republic of Uzbekistan. The air-dried comminuted roots of *Ferula tatarica* (1 kg) were extracted with ethanol three times. The concentrated alcoholic extract was separated by treatment with a 5% solution of sodium carbonate and caustic potash into phenolic, acidic, and neutral fractions.

The phenolic fraction (10 g) was deposited on a column of KSK silica gel, and the substances were eluted with hexane-ethyl acetate (9:1 and then increasing concentrations of the latter). Fractions with a volume of 30 ml were collected.

Four substances of ester nature were isolated: ferocin, $C_{22}H_{28}O_3$, mp 127-128°C; ferocinin, $C_{23}H_{30}O_4$, mp 107-108°C; ferutin, $C_{23}H_{32}O_5$, mp 130-131°C; and teferin, $C_{23}H_{32}O_5$, mp 78-80°C.

By separating the neutral fraction of the total extractive substances on a column of silica gel and washing the column with hexane we isolated two sesquiterpene alcohols: ferutanol, $C_{15}H_{26}O_2$, mp 89-90°C, and fecerol, $C_{15}H_{24}O$, mp 82-83°C.

All the substances isolated were identified by comparison with authentic samples isolated previously from various *Ferula* species [1-4].

It must be mentioned that *Ferula tatarica* is the first representative of the genus *Ferula* where carotane and humulane sesquiterpenes have been found in one and the same plant. This is probably connected with the biogenesis of the terpenoids of these types in Nature.

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