

## COUMARINS OF THE INFLORESCENCES OF *Achillea filipendulina*

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Continuing a study of the extractive substances of the inflorescences of *Achillea filipendulina* Lam. (fernleaf yarrow) gathered at the beginning of flowering in the village of Chimgan, Tashkentskaya oblast [1], we have isolated two substances of coumarin nature from the ether fraction by column chromatography on silica gel.

Substance (1) —  $C_9H_8O_2$ , mp 24—25°C (from ethanol).  $R_f$  0.67 (*n*-hexane—ethyl acetate, 3:1),  $\lambda_{max}(C_2H_5OH)$  270, 332 nm. In the IR spectrum of (1) we observed absorption bands characteristic for the carbonyl of a benzo- $\alpha$ -pyrone (1712  $cm^{-1}$ ) and for an aromatic system (1620, 1597  $cm^{-1}$ ). On the basis of its spectral characteristics and a mixed melting point with an authentic specimen, substance (1) was identified as dihydrocoumarin.

Substance (2) —  $C_6H_6O_4$ , mp 266—268°C (from ethanol)  $R_f$  0.23 (in the above-mentioned system),  $\lambda_{max}(C_2H_5OH)$  255, 300, and 342 nm. In the IR spectrum of (1) we observed absorption bands at 3324 (stretching vibrations of OH groups), 1699 (stretching vibrations of the carbonyl of a benzo- $\alpha$ -pyrone), 1652, 1607, and 1580  $cm^{-1}$  (C=C vibrations of an aromatic nucleus) [2]. On the basis of a comparison of the spectral characteristics and a mixed melting point with an authentic specimen, substance (2) was identified as esculetin.

This is the first time that dihydrocoumarina and esculetin have been identified in the inflorescences of *A. filipendulina*.

### REFERENCES

1. F. F. Urmanova, D. K. Pulatova, and Kh. M. Komilov, *Kimē va Farmatsiya*, No. 4, 25 (1998).
2. M. E. Perel'son, *Zh. Obshch. Khim.*, **33**, No. 3, 952 (1963).