FLAVONOIDS OF *Achillea nobilis*

O. V. Solomko, S. F. Dzhumyrko,
and V. A. Kompantsev

UDC 547.972

We have studied *Achillea nobilis* L., family Compositae for the flavonoid compounds that it contains [1]. Fresh nonflowering shoots of this plant (9.5 kg) collected in the vegetation stage in May on the southern slopes of Mt. Mashuk in the environs of Pyatigorsk were subjected to exhaustive extraction with distilled water on the boiling water bath. The aqueous extract was evaporated, purified with chloroform, and saturated with ethyl acetate. On prolonged standing in the cold, colored crystals of the total flavonoids, consisting of three compounds, deposited. They were separated on a column of polyamide sorbent previously treated with a 10% solution of hydrochloric acid. The individual compounds were isolated by elution with increasing concentrations of aqueous ethanol: 15-20% ethanol gave substance (I); 25-30% gave substance (II); and 45-50% gave substance (III). The compounds isolated were identified on the basis of the results of chromatographic analysis, melting points, UV and IR spectra, chemical transformations, and comparison with authentic samples.

Substance (I), $C_{21}H_{20}O_{10}$, mp 228-230°C (ethanol) was apigenin 7-glycoside (cosmosiin) [2].

Substance (II), $C_{21}H_{20}O_{11}$, mp 257-258°C (ethanol), was characterized as luteolin 7-glucoside (cynaroside).

Substance (III), $C_{21}H_{18}O_{11}\cdot H_2O$ (crystals at 300°C and above having no clear mp) was apigenin 7-glucuronide [3].

The total flavonoids were determined quantitatively by the method of Bandyukova and Shinkarenko [4] using a column of polyamide sorbent. The sum of the flavonoids amounted to 3.33% calculated on the absolutely dry raw material.

LITERATURE CITED

1. K. S. Afanas'ev, The Genus *Achillea*; Flora of the USSR [in Russian], Vol. XXVI, Moscow–Leningrad (1961), p. 76.
2. S. F. Dzhumyrko, Khim. Prirodn. Soedin., 792 (1974).
3. T. A. Khokhrina, V. A. Peshkova, and V. I. Glyzin, Khim. Prirodn. Soedin., 802 (1973).
4. V. A. Bandyukova and A. L. Shinkarenko, Zh. Anal. Khim., 2, 252 (1966).

Pyatigorsk Pharmaceutical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 2, pp. 266-267, March-April, 1978. Original article submitted November 16, 1977.

 0009-3130/78/1402-0224$07.50