# PHENOLIC COMPOUNDS OF Alchimilla tianschanica

B. A. Iskakova, S. B. Rakhmadieva, and M. S. Erzhanova

UDC 547.972

Plants of the genus Alchimilla L. have long been used in folk medicine (as a hemostatic, antiinflammatory, expectorant, and diuretic agent [1]), and in fresh and dried form they are used in food [2]. The chemical composition of plants of the genus Alchimilla L. has been little studied, but astragalin, rutin, and hyperoside have been isolated from A. vulgaris Juz [3].

We have investigated the phenolic compounds of the epigeal part of A. tianschanica, which is widely distributed on the territory of Kazakhstan. It is a perennial herb with a creeping rootstock [4].

The raw material was extracted with 50% aqueous acetone. After the elimination of the solvent the phenolic compounds were extracted from the residue with chloroform, ether, ethyl acetate, and n-butanol. The chloroform extract was subjected to column chromatography on polyamide with elution by chloroform–methanol containing increasing concentrations of methanol and was rechromatographed on Sephadex LH-20 with 30% ethanol as eluent, which enabled two substances of phenolic nature, (I) and (II), to be isolated.

Substance (I) – chrysoeriol, $C_{16}H_{12}O_6$, mp 328-330°C, UV spectrum: $\lambda_{max}^{CH_3OH}$, nm; 346, 255. IR spectrum, $\nu_{max}^{KBr}$, $cm^{-1}$: 3400 (OH), 2856 ($CH_3O$), 1660, 1510 (Ar) [3].

Substance (II) – quercetin, $C_{15}H_{10}O_7$, mp 308-310°C. UV spectrum, $\lambda_{max}^{CH_3OH}$, nm: 373, 255. IR spectrum, $\nu_{max}^{KBr}$, $cm^{-1}$: 3400 (OH), 1660, 1620 (Ar) [5].

Substances (III) and (IV) were isolated from the ethereal extract by column chromatography on Sephadex LH-20 with elution by water.

Substance (III) – caffeic acid, $C_9H_8O_4$, mp 196-197°C [6].

Substance (IV) – vanillic acid $C_8H_8O_4$, mp 200-201°C [3].

By column chromatography on Sephadex LH-20 with elution by 50% ethanol, the ethyl acetate extract yielded substance (V).

Substance (V) – quercetin rhamnoside, $C_{21}H_{20}O_{11}$, mp 187-188°C. UV spectrum, $\lambda_{max}^{CH_3OH}$, nm: 350, 258. Acid hydrolysis led to the formation of quercetin and rhamnose [5].

Substances (I-V) were identified on the basis of qualitative reactions, chromatographic behavior, physical constants, the products of acid and alkaline hydrolysis, UR and UV spectra with diagnostic additives, and comparison with markers. This is the first time that any of these substances have been isolated from A. tianschanica.

## LITERATURE CITED

1. M. Zh. Kozhabekov, Medicinal Plants: Kazakhstan [in Russian], Alma-Ata (1975), p. 89.
2. A. K. Koshcheev, Edible Wild Plants in Our Nutrition [in Russian], Nauka, Moscow (1980), pp. 76, 193.
3. L. A. Klyshev, V. A. Bandyukova, and L. S. Alyukina, Plant Flavonoids [in Russian], Nauka, Alma-Ata (1978), pp. 40, 102.
4. V. P. Mikhailova, Tanning Plants of the Flora of Kazakhstan and Their Utilization [in Russian], Nauka, Alma-Ata (1986), p. 94.
5. G. A. Shpekina, Khim. Prir. Soedin., 118 (1990).
6. L. I. Dranik, in: Proceedings of the First All-Union Symposium on Phenolic Compounds [in Russian], Nauka, Moscow (1986), pp. 54-56.

S. M. Kirov Kazakh State University, Alma-Ata. Translated from Khimiya Prirodnykh Soedinenii, No. 6, pp. 853-854, November-December, 1991. Original article submitted November 22, 1990; revision submitted April 22, 1991.

 0009-3130/91/2706-0754$12.50 