FLAVONOIDS OF Cerasus tianschanika

O. A. Sapko, R. M. Kunaeva, and T. V. Ryakhovskaya

UDC 547.972

The epigeal part of the Tien Shan cherry Cerasus tianschanika Pojark [1], gathered in the Dzhambul province of the Kazakhstan SSR, has been studied for its flavonoid contents.

The dried and comminuted leaves and stems, separately, were freed from lipophilic substances with benzene. The flavonoids were extracted with 96% ethanol. The extracts were evaporated in vacuum. On standing, the aqueous residue to the extract of the leaves deposited a precipitate, the recrystallization of which from ethanol gave acicular crystals of sustance (I) – $C_{27}H_{30}O_{16}$, mp 184-186°C, $\lambda_{\max}^{C_2H_5OH}$ 258, 360 nm, $[\alpha]_D^{20}$ −32.4° (c 0.4; ethanol). On acid hydrolysis, quercetin, glucose, and rhamnose were detected. Substance (I) was identified as rutin [2, 3]. The concentration of rutin in the leaves was 0.93%.

The total flavonoids of the branches were separated by selective extraction using chloroform, diethyl ether, and ethyl acetate successively. The ethereal fraction, by column partition chromatography on silica gel (with a gradient chloroform—ethanol system as eluent) and adsorption on polyamide (with a water—ethanol gradient system as eluent), yielded four individual compounds, (II)-(V).

Compound (II) – $C_{15}H_{10}O_7$, mp 308-310°C, $\lambda_{\max}^{C_2H_5OH}$ 256, 270 nm.

Compound (III) – $C_{15}H_{12}O_5$, mp 246-248°C, $\lambda_{\max}^{C_2H_5OH}$ 292, 325* nm, $[\alpha]_D^{20}$ +17° (c 0.5; ethanol).

Compound (IV) – $C_{15}H_{12}O_6$, mp 240-242°C, $\lambda_{\max}^{C_2H_5OH}$ 216, 292, 325* nm.

Compound (V) – $C_{15}H_{12}O_7$, mp 234-236°C, $\lambda_{\max}^{C_2H_5OH}$ 290, 336* nm.

On the basis of UV, IR, and PMR spectra the results of elementary analysis, and the products of alkaline fusion, compound (II) was identified as 3,3',4',5,7-pentahydroxyflavone (quercetin), compound (III) as 4',5,7-trihydroxyflavanone (naringenin), compound (IV) as 3,4',5,7-tetrahydroxydihydroflavonol (dihydrokaempferol), and compound (V) as 3,3',4',5,7-pentahydrodihydroflavonol (taxifolin) [4].

By partition chromatography on silica gel (with diethyl ether as eluent), the ethereal fraction from the branches yielded two compounds which, on the basis of qualitative reactions, were assigned to the catechins. Compound (VI) – $C_{15}H_{14}O_6$, mp 176-178°C (from water), $[\alpha]_D^{20}$ +16.9° [c 0.9; acetone—water (1:1)], $\lambda_{\max}^{C_2H_5OH}$ 276 nm. On fusion with alkali, phloroglucinol and protocatechuic acid were obtained. Comaprison with an authentic sample showed its identity with (+)-catechin. Compound (VII) – $C_{15}H_{14}O_6$, mp 230-233°C, $[\alpha]_D^{20}$ −59° [c 0.7; acetone-water (1:1)]. The products of alkaline fusion were phloroglucinol and protocatechuic acid. A mixture with an authentic sample of (−)-epicatechin gave no depression of the melting point.

This is the first time that substances (III)-(V) have been isolated from the species Cerasus tianschanika.

LITERATURE CITED

1. The Flora of Kazakhstan [in Russian], Nauka, Alma-Ata, Vol. 4 (1961).
2. L. K. Klyshev, V. A. Bandyukova, and L. S. Alyukina, Plant Flavonoids [in Russian], Nauka, Alma-Ata (1978), p. 220.
3. T. K. Chumbalov and Z. S. Dzhumagulova, Khim. Prir. Soedin., 670 (1973).
4. T. J. Mabry, K. R. Markham, and M. B. Thomas, The Systematic Identification of Flavonoids, Springer, New York (1970).

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*Inflection.

Institute of Molecular Biology and Biochemistry, Academy of Sciences of the Kazakhstan SSR, Alma-Ata. Translated from Khimiya Prirodynkh Soedinenii, No. 6, pp. 873-874, November-December, 1988. Original article submitted March 4, 1988; revision submitted July 1, 1988.

0009-3130/88/2406-0747$12.50