LITERATURE CITED

1. N. Annenkov, Botanical Dictionary [in Russian], St. Petersburg (1878), p. 211.
2. N. Z. Umikov, Fruits, Berries, Vegetables, Cereals, and Spices [in Russian], Tbilisi (1953), p. 85.
3. A. B. Nikolaev, Some Information on the Use of Medicinal Plants in Folk Medicine [in Russian], Moscow (1972), p. 28.

AN APIGENIN GLUCURONIDE FROM *Leucanthemum vulgare*

T. G. Sagareishvili, M. D. Alaniya,
and É. P. Kemertelidze

UDC 547.972

We have previously reported the different flavonoid compositions of the ligulate and tubular flowers of *Leucanthemum vulgare* Lam. [1, 2].

Continuing a study of the chemical composition of the ligulate flowers, we have isolated another individual flavonoid — pale yellow crystals with the compositions $C_{21}H_{18}O_{11}$, mp 320-323°C (decomp.), $[\alpha]_D^{28}$ −92.0 (c 0.6 pyridine–water (1:1)); molecular mass 446.4. UV spectrum $\lambda_{max}^{C_2H_5OH}$ 336, 270 nm; (+NaOAc) 336, 270 nm; (+$AlCl_3$) 380, 285 nm; (+$AlCl_3$ + HCl) 336, 270 nm; (+NaOMe) 400, 276 nm. The IR spectrum had an intense absorption band at 1725 cm^{-1} (C=O group of an acid).

The glycoside was hydrolyzed with 10% H_2SO_4 for 5 h. This formed 68% of an aglycone with the composition $C_{15}H_{10}O_5$, mp 349-351°C. UV spectrum $\lambda_{max}^{C_2H_5OH}$ 336, 269 nm; (+NaOAc) 380, 274 nm; (+$AlCl_3$) 380, 275 nm; (+$AlCl_3$ + HCl) 336, 269 nm; (+NaOMe) 400, 275 nm. Phloroglucinol and p-hydroxybenzoic acid were found in the products of alkaline fusion. The aglycone was characterized as 4',5,7-trihydroxyflavone — apigenin [1-3].

The glycoside was hydrolyzed by the enzyme β-glucuronidase [4].

D-Glucuronic acid* was detected in the aqueous fractions of the acid and enzymatic hydrolysates by PC analysis.

A comparison of the physicochemical constants of the glycoside under investigation and an authentic sample of apigenin 7-O-β-D-glucuronide, together with literature information [5-7], showed their identity.

The results of the chemical study were confirmed by those of NMR spectroscopy in a comparative analysis of the aglycone, the glycoside itself, and an authentic sample.

Thus, the compound isolated has been characterized as apigenin 7-O-β-D-glucosiduronic acid.

LITERATURE CITED

1. T. G. Sagareishvili, M. D. Alaniya, and É. P. Kemertelidze, Khim. Prir. Soedin, 567 (1980).
2. T. G. Sagareishvili, M. D. Alaniya, V. S. Kikoladze, and É. P. Kemertelidze, Khim. Prir. Soedin., 442 (1982).
3. M. D. Alaniya, N. F. Komissarenko, and É. P. Kemertelidze, Khim. Prir. Soedin., 527 (1971).
4. S. P. Colowick and N. O. Kaplan, Methods Enzymol., 1, 262 (1955).
5. H. Wagner, H. Danninger, M. A. Iyengar, O. Seligmann, L. Farkas, S. S. Subramanian, and A. G. R. Nair, Chem. Ber., 104, 2681 (1971).

---

*D-Glucuronic acid was kindly supplied by N. F. Komissarenko, and apigenin 7-O-β-D-glucosiduronic acid by J. Harborne.

I. G. Kutateladze Institute of Pharmacochemistry, Academy of Sciences of the Georgian SSR, Tbilisi. Translated from Khimiya Prirodnykh Soedinenii, No. 5, pp. 647-648, September-October, 1983. Original article submitted April 18, 1983.

0009-3130/83/1905-0614$07.50

6. V. L. Shelyuto, V. I. Glyzin, and N. T. Bubon, Khim. Prir. Soedin., 240 (1972).
7. J. B. Harborne, V. H. Heywood, and N. A. Saleh, Phytochemistry, 9, 2011 (1970).

FLAVONOIDS OF *Bupleurum rotundifolium*

R. T. Baeva and M. O. Karryev

UDC 547.972

We have investigated the epigeal part of *Bupleurum rotundifolium* L. (roundleaf thorowax), family *Apiaceae*, gathered in the flowering-fruit-bearing period in May-June, 1980, in the Kara-Kala region (Ai-Dere gorge).

By paper and thin-layer chromatography using color reactions in an ethanolic extract of the epigeal part of *B. rotundifolium* we detected eight triterpene glycosides and six flavonoids. To separate the phenolic fraction from the saponin fraction we used EDE-10P anion-exchange resin (OH form [1]).

The combined flavonoids obtained were deposited on a column of polyamide sorbent and were eluted successively with water and ethanol of various concentrations. To separate the mixture of flavonoids we also used preparative paper chromatography. Six flavonoid compounds were isolated, and these were identified from their chromatographic behavior, physicochemical properties, IR spectra with diagnostic reagents, the products of acid and enzymatic hydrolysis, and comparison with authentic samples.

Substance (I), mp 310-311°C (70% ethanol), λ_{max} 255, 269 sh., 370 nm, was quercetin.

Substance (II), mp 298-300°C (methanol), λ_{max} 253, 268 sh., 370 nm, was isorhamnetin.

Substance (III), mp 240-242°C (methanol), $[\alpha]_D^{20}$ −58° (c 0.5; ethanol), λ_{max} 255, 269 sh., 360 nm, was characterized as isorhamnetin 3-glucoside.

Substance (IV), mp 228-230°C (aqueous ethanol), $[\alpha]^{20}$ −20° (c 0.5; methanol), λ_{max} 255, 265 sh., 362 nm, consisted of quercetin 3-glucoside (isoquercitrin).

Substance (V), mp 180-182°C (methanol), λ_{max} 254, 265 sh., 356 nm, was isorhamnetin 3-rutinoside.

Substance (VI), mp 190-191°C, $[\alpha]_D^{20}$ −30° (c 0.3; methanol), λ_{max} 258, 362 nm, was identified as rutin.

Compounds (I), (II), and (IV-VI) had been isolated previously from *Bupleurum multinerve* DC. collected in Siberia.

LITERATURE CITED

1. R. T. Baeva and M. O. Karryev, Khim. Prir. Soedin., 171 (1974).
2. V. N. Minaeva and T. A. Volkhonskaya, Dokl. Akad. Nauk SSSR, 154, 956 (1964).

Institute of Botany, Academy of Sciences of the Turkmen SSR, Ashkhabad. Translated from Khimiya Prirodnykh Soedinenii, No. 5, p. 648, September-October, 1983. Original article submitted April 22, 1983.

0009-3130/83/1905- 0615$07.50