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A FLAVONOL GLYCOSIDE FROM PLANTS OF THE GENUS Phellodendron

V. É. Otryashenkova, V. I. Glyzin,
and G. K. Shreter

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A glycoside with the composition $C_{26}H_{32}O_{12}$, mp 205°C, λ_{max} 290, 345 nm has previously been isolated from Phellodendron amurense Rupr. (Amur cork tree) and has been named phellamurin. It has the structure of noricaritin 7-O-β-D-glycoside. A glycoside with the composition $C_{26}H_{32}O_{12}$, mp 154-156°C, has been isolated from P. japonicum Maxim (Japanese cork tree) and P. amurense, and this has been assigned the structure of β-anhydronoricaritin 3-O-β-D-glucoside and the name phellodendroside [2]. From the same plant has been isolated a glycoside with the composition $C_{32}H_{42}O_{17}$, mp 152-153°C, λ_{max} 225, 290, 345 nm having the structure of dihydronoricaritin 7,γ-di-O-β-glucopyranoside which has been called dihydrophelloside [3]. From P. lavallei Dode. (Lavalle cork tree) and P. amurense a glycoside has been isolated with the composition $C_{26}H_{32}O_{12}$, mp 151-153°C, λ_{max} 290, 345 nm, for which the structure of isonoricaritin 7-O-β-D-glucopyranoside and the name phellavin have been proposed [4].

Phellodendroside, dehydrophelloside, and phellavin have similar constants and are the main flavonol glycosides of the materials investigated. To compare their flavonol compositions, we studied six species of cork tree the constants of the substances obtained being given below. The initial material consisted of the leaves of the plants collected in Maritime Territory (P. amurense) and in the botanical garden of the Academy of Sciences of the Uzbek SSSR in Tashkent (the other plants):

Plant	Composition	mp, °C	λ_{max} (CH_3OH)
Phellodendron amurense Rupr.	$C_{26}H_{32}O_{12}$	200-203	220, 291, 346
	$C_{26}H_{32}O_{12}$	151-154	220, 291, 346
P. japonicum Maxim	$C_{26}H_{32}O_{12}$	150-155	220, 291, 348
P. chinense Schneid.	$C_{26}H_{32}O_{12} \cdot 1H_2O$	150-153	220, 291, 346
P. Lavallei Dode.	$C_{26}H_{32}O_{12}$	150-152	220, 291, 346
P. sacchalinense (Fr. Schmidt) Sarg.	$C_{26}H_{32}O_{12} \cdot 1/2H_2O$	150-152	220, 291, 346
P. piriforme E. Wolf.	$C_{26}H_{32}O_{12} \cdot 1/2H_2O$	150-154	220, 291, 346

From the Amur cork tree together with the main glycoside (mp 151-154°C) we isolated a glycoside with the composition $C_{26}H_{32}O_{12}$, mp 200-203°C, which is probably phellamurin.

The glycosides from R. japonicum, P. chinense Schneid. (Chinese cork tree), P. sacchalinense (Fr. Schmidt.) Sarg. (Sakhalin cork tree), and P. piriforme E. Wolf (pearfruit cork tree) proved from their chromatographic mobilities [Silufol UV-254, chloroform–ethyl acetate–formic acid (6 : 6 : 3) system], melting points,

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λ_{max} values, and IR and NMR spectra to be identical with phellavin. Since the glycosides that we isolated are the main flavonol components of the plants investigated, it may be assumed that various authors previously isolated just this glycoside and described it under different names.

Thus, it may be considered as established that the main flavonol glycoside of the species of the genus Phellodendron investigated is phellavin – isonoricaritin 7-O-β-D-glucopyranoside [4',5-dihydroxy-7-β-D-glucopyranosyloxy-6-(γ-hydroxypentyl)flavonol].

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POLYPHENOLS OF Alhagi kirgisorum. III

G. Sh. Burasheva, M. M. Mukhamed'yarova, and T. K. Chumbalov

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Continuing a study of the polyphenol composition of the epigeal part of Alhagi kirgisorum Schrenk, by column chromatography on polyamide we have isolated substances with mp 250°C and 145-147°C.

Substance (VIII) with mp 250°C (acetate with mp 210-212°C) contained, according to a spectral study, hydroxy groups in position 3, 3', 5, and 7, and on alkaline cleavage it formed phloroglucinol and isovanillic acid, and its IR spectrum had a band at 2860-2900 cm^{-1} which is characteristic for a $-OCH_3$ group. By comparing the results obtained with literature information it was identified as tamarixetin (3,3',5,7-tetrahydroxy-4'-methoxyflavone).

Substance (IX) formed yellow-green crystals with mp 145-147°C, $[\alpha]_D^{24}$ −42° (c 0.335; pyridine), $M_D \cdot K_p = -111.5$ [2]. Isorhamnetin, rhamnose, and galactose (1 : 1 : 1) were found in the products of acid hydrolysis (2% HCl, 100°C, 2 h).

The arrangement of the bonds in the biose was 1→ 6 (positive reaction with diphenylamine) [3].

From the results of UV and IR spectroscopy, acid and enzymatic hydrolyses, and peroxide oxidation, substance (IX) was identified as isorhamnetin 3-O-galactopyranosyl-(1 → 6)-rhamnopyranoside.

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S. M. Kirov Kazakh State University, Alma-Ata. Translated from Khimiya Prirodnykh Soedinenii, No. 5 p. 663, September-October, 1976. Original article submitted May 12, 1976.

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