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CAVIUNIN 7-*O*-RHAMNOGLUCOSIDE FROM *DALBERGIA PANICULATA* ROOT*

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In continuation of earlier investigations on *Dalbergia paniculata* [1–8], we now report the isolation and structure of a new isoflavone glycoside, caviunin 7-*O*-rhamnoglucoside from an acetone extract of the defatted root.

Caviunin has been shown to be present in almost every organ of *D. paniculata* [1] and the fact that it also occurs in seven other *Dalbergia* species [9–15] suggest, it is a taxonomic marker for the genus. Caviunin has also been isolated in glycosidic form from two plants, viz. caviunin 7-*O*-glucoside from the root of *D. paniculata* [16] and caviunin 7-*O*-glycoside (sugar not characterized) from the wood of *D. riparia* [12]. Caviunin 7-*O*-rhamnoglucoside now isolated is the third glycoside of this isoflavone to be reported.

EXPERIMENTAL

Shade-dried root chips (2 kg) were Soxhleted successively with petrol (60–80°), C_6H_6 and Me_2CO. Petrol extraction afforded sitosterol; C_6H_6 extraction yielded caviunin; Me_2CO extraction deposited (+)-pinitol. Mp, mmp, co-chromatography and superimposable IR spectra corroborated the identifications.

The mother liquor of the Me_2CO extract on Si gel followed by Polyamide CC yielded the new isoflavone glycoside (96 mg); mp 138–139° (Found: C, 52.00; H, 6.19; $C_{31}H_{38}O_{17} \cdot 2H_2O$ requires: C, 51.80; H, 5.89%); $[\alpha]_D^{31} - 94.64°$ (c 0.56, MeOH). It had λ_{max}^{MeOH} nm (log ε): 264 (4.66) and 291 (4.42); λ_{max}^{NaOAc} nm: 265 and 291; $\lambda_{max}^{AlCl_3}$ nm: 275 and 300 (infl.); $\lambda_{max}^{AlCl_3-HCl}$ nm: 276 and 300 (infl.). It gave positive Wolfrom [17] and Molisch tests suggesting that it was an isoflavone 7-*O*-glycoside. β-Glucosidase hydrolysis did not afford any aglycone, but acid hydrolysis with 6% aq. alc. HCl produced glucose and rhamnose as sugars, and an aglycone recrystallized from EtOH as colourless slender needles, mp 190–191°. It formed a diacetate: $C_{23}H_{22}O_{10}$, mp 197–199°. This aglycone was identified as 5,7-dihydroxy-6,2′,4′,5′-tetramethoxyisoflavone (caviunin) by mmp, co-chromatography and superimposable IR and ^{1}H NMR spectra. Partial hydrolysis of the glycoside employing Killiani reagent [18] afforded rhamnose and caviunin 7-*O*-glucoside [16], mp 235–236°, identified by mmp, co-chromatography and superimposable UV and IR spectra with an authentic sample. Thus the structure of the new isoflavone glycoside has been established as caviunin 7-*O*-rhamnoglucoside and was supported by the ^{1}H NMR spectrum of its heptaacetate, $C_{45}H_{52}O_{24}$, mp 129–130°, (60 MHz, $CDCl_3$, TMS int. standard): δ7.83 (1H, *s*, C-2), 7.10 (1H, *s*, C-8), 6.78 (1H, *s*, C-6′), 6.54 (1H, *s*, C-3′), 3.89–5.39 (12H, *m*, sugar protons), 3.83, 3.81, 3.75, 3.71 (4 × 3H, each *s*, 4 × —OMe), 2.37 (3H, *s*, aromatic —OAc), 2.00 (6 × 3H, *br s*, 6 × alc.–OAc), 1.22 (3H, *s*, rhamnose Me).

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REFERENCES

1. Adinarayana, D., Radhakrishniah, M. and Rajasekhara Rao, J. (1971) *Curr. Sci.* **40,** 602.
2. Adinarayana, D., Radhakrishniah, M., Rajasekhara Rao, J., Campbell, R. and Crombie, L. (1971) *J. Chem. Soc. C* 29.
3. Adinarayana, D. and Rajasekhara Rao, J. (1972) *Tetrahedron* **28,** 5377.
4. Adinarayana, D. and Rajasekhara Rao, J. (1972) *8th Int. Symp. Chem. Nat. Prod.* p. 96. I.U.P.A.C. New Delhi.
5. Adinarayana, D. and Rajasekhara Rao, J. (1973) *Phytochemistry* **12,** 2543.
6. Adinarayan, D. and Rjasekhara Rao, J. (1974) *Indian J. Chem.* **12,** 911.
7. Adinarayana, D. and Rajasekhara Rao, J. (1975) *Indian J. Chem.* **13,** 425.
8. Adinarayana, D. and Rajasekhara Rao, J. (1975) *Proc. Indian Acad. Sci. Sect. A* **81,** 23.
9. Gottlieb, O. R. and Magalhães, M. T. (1961) *J. Org. Chem.* **26,** 2449.
10. Ollis, W. D. (1966) *Experientia* **22,** 777.
11. de Silva Braga, A., Arndt, V. H., Magalhães Alves, H., Gottlieb, O. R., Magalhães, M. T. and Ollis, W. D. (1967) *An. Acad. Bras. Cienc.* **39,** 249.
12. Filho, R. B., Leite de Almeida, M. E. and Gottlieb, O. R. (1973) *Phytochemistry* **12,** 1187.
13. Manners, G. D., Jurd, L. and Stevens, K. (1974) *Phytochemistry* **13,** 292.
14. Leite de Almeida, M. E. and Gottlieb, O. R. (1974) *Phytochemistry* **13,** 751.
15. Cook, J. T., Ollis, W. D., Sutherland, I. O. and Gottlieb, O. R. (1978) *Phytochemistry* **17,** 1419.
16. Radhakrishniah, M. (1979) *J. Indian Chem. Soc.* **56,** 81.
17. Wolfrom, M. L., Morgan, P. W. and Benton, F. L. (1940) *J. Am. Chem. Soc.* **62,** 1484.
18. Killiani, H. (1930) *Ber.* **63,** 2866.

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