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SHORT COMMUNICATION

TRITERPENES OF *HOPEA PUBESCENS* RESINS

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Abstract—Three triterpenes from *Hopea pubescens* have been isolated and identified as hydroxydammarenone-I, dammarenediol-I and oleanolic acid which was isolated as its methyl ester.

Plant. *Hopea pubescens* Ridl.—Dipterocarpaceae.

Source. Jemaluang, Johore State; also found in the States of Kelantan and Pahang, West Malaysia.[1]

Uses. Commercial value as light hardwood timber.[1,2]

Previous work. On resins from sister species, probably *H. micrantha*,[3] and other species of the genus *Doona* Thw.[4]

Resins. Extracted in Soxhlet with benzene; separated into neutral and acidic fractions; chromatographed each fraction on alumina (neutral, activity III).

Hydroxydammarenone-I. $C_{30}H_{50}O_2$ (m.p. $[\alpha]_D^3$); $NaBH_4$ reduction to dammarenediol-I (m.p., mxd. m.p., i.r.).

Dammarenediol-I. $C_{30}H_{52}O_2$ (m.p., $[\alpha]_D$, m.p.s. of acetate and benzoate[3]).

TABLE 1. CHEMICAL SHIFT * (τ VALUES)

	4α-Me	4β-Me	8-Me	10-Me	14-Me	20-Me	26- and 27-Me		24-H (*m*)
Hydroxydammarenone-I	8·9	8·95	9·1	9·0	9·15	8·90	8·35,	8·3	*ca.* 4·85
Dammarenediol-I	8·9	8·95	9·1	9·1	9·13	8·85	8·4,	8·35	*ca.* 4·9
Dammarenediol-II[5a, b] (Dipterocarpol)	8·9	8·95	9·0	9·05	9·1	8·85	8·4,	8·3	*ca.* 4·9

* Measured in $CDCl_3$ with a Varian Associates A-60 spectrometer (60 Mc) using TMS as internal standard; singlets unless otherwise stated, *m* = multiplet.

[1] I. H. BURKILL, *Dictionary of the Economic Products of the Malay Peninsula*, Vol. 1, p. 1194, Government Printing Press, Singapore (1935).

[2] J. WYATT-SMITH and K. M. KOCHUMMEN, *Pocket Check List of Timber Trees, Malayan Forest Records*, No. 17, p. 18, Nan Yang Press, Kuala Lumpur, Malaysia (1952).

[3] J. S. MILLS and A. E. A. WERNER, *J. Chem. Soc.* 3132 (1955), and references cited therein; J. S. MILLS, *J. Chem. Soc.* 2196 (1956).

[4] M. A. DIAZ and G. OURISSON, *Phytochem.* 5, 855 (1966).

The NMR spectra (see table) of hydroxydammarenone-I and dammarenediol-I are remarkably similar to that of hydroxy-dammarenone-II (dipterocarpol)[5a,b] whose structure has been well established.[6]

Oleanolic acid. Isolated as methyl ester by diazomethane (m.p., mxd. m.p., i.r.; m.p. of acetate[7]).

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