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Phytochemical analysis of the leaves and stems of *Paramignya monophylla* Wight (Rutaceae)

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The genus *Paramignya*, family Rutaceae, sub-family Aurantioideae, consists of fifteen species and two subspecies, scattered across S. E. Asia from India to Indonesia and the Philippines. The genus is difficult to distinguish from *Luvunga* [Swingle 1967]. Flavonoids were stated to be absent from *P. monophylla* [Grieve 1980] and *P. lobata*, included in a survey of Malaysian plants [Bowen 1978], was shown to contain steroidal or triterpenoid compounds but not alkaloids.

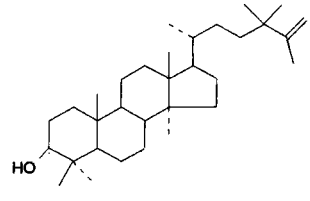
The air dried leaves and stems of *Paramignya monophylla* were extracted with petroleum and with chloroform. Both extracts showed a similar TLC profile.

The leaves yielded a steroidal compound, m.p. 165°, designated **PM1** whilst the stems additionally contained a compound **PM2**, crystallising as yellow needles m.p. 224-225°, which gave a positive Shinoda test [Geissman 1962], suggesting it was a flavonoid.

PM1 had IR and NMR spectra characteristic of a steroid. M^+ and accurate mass gave its molecular formula as $C_{32}H_{56}O$. IR data indicated OH (3400 cm^{-1}) and terminal methylene group (1640 cm^{-1}, 890 cm^{-1}). The NMR showed signals for eight C-methyls (δ 0.78 - 1.02), a vinylic methyl (δ 1.69), CHOH (OH at δ 1.47, D_2O exchangable, H at δ 3.74) and two proton doublet (δ 4.69, J = 13Hz).

The spectral data was remarkably similar to that for 24,24-dimethyl-lanosta-7,25-dien-3α-ol from *Mallotus stenanthus* (Euphorbiaceae) [Pal 1975], except PM1 did not appear to have ring unsaturation at the 7,8 position. Hydrogenation of PM1 gave a compound $C_{32}H_{58}O$ whose NMR lacked signals for the terminal methylene and vinylic protons The half-height width for the CHOH signal in the NMR (12Hz) suggested an equatorial OH [Chan 1973]. We therefore propose the structure 24,24-dimethyl-lanosta-25-en-3β-ol (I) for compound PM1.

PM2 (M+ 366) had molecular formula $C_{21}H_{18}O_6$ and presence of phenolic OH supported by +ve ferric chloride test and UV and IR spectra. A strong absorption at 1640 cm^{-1} indicated carbonyl. The NMR and MS data bore a strong resemblance to that for carpachromene (**IIa**), isolated from *Atalantia ceylanica* (Bowen 1987), supporting the linear pyranoflavone structure but with, in addition, a OCH_3 group resonating at δ 4.01. Comparison of NMR data with a catalogued range of flavonoids [Mabry 1970] supported a 4'-hydroxy-3'-methoxy- substitution of the B-ring, and the structure of PM2 is therefore 4',5-dihydroxy-3'-methoxy-6'',6''-dimethylpyrano (2'',3'':7,6)flavone or 3'-methoxycarpachromene (**IIb**).



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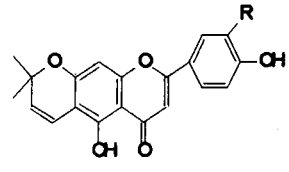

IIa: R=H ; **IIb**: R=OCH_3

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