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ALKALOIDS FROM THE ROOT BARK OF *ZANTHOXYLUM MYRIACANTHUM*

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Key Word Index—*Zanthoxylum myriacanthum*; Rutaceae; benzophenanthridine alkaloids; nitidine; dihydronitidine.

Plant Zanthoxylum myriacanthum Wall. *ex* Hook. f. [1] (Voucher: P. G. Waterman 530 deposited at the Herbarium of the Royal Botanic Garden, Edinburgh). *Source.* The root bark was collected from trees growing beside the Genting Highlands road, Pahang State, Malaysia, between the 10 and 12 km signs. *Previous work.* TLC examination of the bark of material collected in Hong Kong revealed the presence of several alkaloids [2]. *Plant part examined.* Root bark.

Present work. Root bark (150 g) was extracted in a Soxhlet apparatus successively with petrol (bp 40–60°), $CHCl_3$ and MeOH. Column chromatography of the petrol conc over Si gel, eluting with hexane, gave sitosterol (8 mg) mp 138° identical in all respects (IR, TLC, mmp) with an authentic sample. Further elution with EtOAc gave dihydronitidine (23 mg) mp 209° from MeOH (lit. [3] 208–211°) M^+ 349·1307; $C_{21}H_{19}NO_4$ requires 349·1314. The sample was identical in all respects (UV, IR, MS, TLC, mmp) with synthetic dihydronitidine produced by the reduction of nitidine with $NaBH_4$.

On shaking with 1 N HCl the $CHCl_3$ concentrate gave a yellow ppt which was recrystallized from EtOH–HNO_3 to yield nitidine nitrate (53 mg) mp 239°, identical in all respects (UV, IR, TLC, mmp) with an authentic sample.

Trace amounts of the quaternary alkaloids magnoflorine and tembetarine were detected by previously described TLC procedures [4] in the partially purified MeOH extract.

Biological significance. The restricted range of alkaloids recorded from *Z. myriacanthum*, with nitidine predominating, is similar to that found in *Z. nitidum* DC [3] but unlike that of *Z. ailanthoides* Sieb. and Zucc. [5,6] to which it is supposedly closely allied [7]. The absence of the pentacylcic triterpene lupeol, noted previously [2], was confirmed in this study.

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CAROTENE EPOXIDES FROM THE *DELTA* TOMATO MUTANT

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Although the carotenoid hydrocarbons of several tomato strains have been well characterized [1,2], very little is known about the oxygenated carotenoids present. Recently we have