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### Chemical Investigation of *Tectona grandis* (roots)

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**T**ECTONA *grandis* (Verbenaceae) commonly grows in India, Burma, Thailand, China and East Indies. Its remarkable resistance to termites makes it the most valuable wood for every type of construction. Chemical examinations of the leaves<sup>1</sup>, wood<sup>2</sup> and roots<sup>3</sup> have been carried out earlier. The present chemical investigation of the roots revealed the presence of eight compounds (A-H) i.e., 1-hydroxy-2-methylanthraquinone, tectoquinone, pachybasin, dehydrotectol, tectol,  $\beta$ -sitosterol, obtusifolin and betulinic acid out of which four compounds viz. tectoquinone, tectol, dehydrotectol and  $\beta$ -sitosterol have been reported earlier from the roots<sup>3</sup>. Obtusifolin is reported for the first time in this genus.

### Experimental

The roots used in this investigation were procured from Kerala. The air dried roots powder (3.5 Kg) was extracted with hot acetone and alcohol respectively. The acetone extract was chromatographed on silicagel. Elution of the column with different solvents and their mixtures yielded compounds (A-H). No compound could be isolated from the alcohol extract.

#### Compound A (1-hydroxy-2-methyl anthraquinone) :

Petroleum ether-benzene (9 : 1). It crystallised from petroleum ether as yellow needles (35 mg), m.p. 183-84° and answered sodium dithionite colour test for quinones. Methyl ether m.p. 156°. It was found to be identical with an authentic sample of 1-hydroxy-2-methyl anthraquinone (m.m.p., Co-TLC and IR Spectra).

#### Compound B (tectoquinone) :

Petroleum ether-benzene (8 : 2). It crystallised from methanol as light yellow needles (1.50 g), m.p. 178°. It was identified as tectoquinone by m.m.p., Co-TLC, superposable IR, NMR and MS.

#### Compound C (pachybasin) :

Petroleum ether-benzene (8 : 2). It crystallised from petroleum ether as yellow needles (100 mg), m.p. 175°. It gave brown colour with alcoholic FeCl<sub>3</sub> and was insoluble in Na<sub>2</sub>CO<sub>3</sub> solution. Methyl ether m.p. 188-89°, acetate m.p. 179-81°. The IR, NMR, UV and MS were found to be identical with that of pachybasin<sup>4</sup>.

#### Compound D (dehydrotectol) :

Petroleum ether-benzene (7 : 3). It crystallised from petroleum ether as blue-green needles (450 mg), m.p. 196-97°.  $\lambda_{\text{max}}^{\text{MeOH}}$  270 and 340 nm. It was identified as dehydrotectol by direct comparison with an authentic sample of dehydrotectol (Co-TLC, m.m.p. and superimposable IR spectra).

#### Compound E (tectol) :

Petroleum ether-benzene (4 : 8). It crystallised from methanol as colourless needles (1g), m.p. 216-18° and gave brown colour with alcoholic FeCl<sub>3</sub>.  $\lambda_{\text{max}}^{\text{MeOH}}$  275, 345 and 362 nm. Methyl ether 217-19°, acetate 197-99°. Its identity was confirmed as tectol by m.m.p., Co-TLC and superimposable IR.

#### Compound F ( $\beta$ -sitosterol) :

Compound F (150 mg) has been identified as  $\beta$ -sitosterol by direct comparison with an authentic sample (m.m.p., Co-TLC and superimposable IR).

#### Compound G (obtusifolin) :

Benzene-ethyl acetate (98 : 2). It crystallised from methanol as yellow needles (60 mg), m.p. 235-37°. It gave brown colour with alcoholic FeCl<sub>3</sub> and was soluble in aqueous Na<sub>2</sub>CO<sub>3</sub> solution.  $\lambda_{\text{max}}^{\text{MeOH}}$  275 and 405 nm. Methyl ether m.p. 143-44°. Compound G was found to be identical with an authentic sample of obtusifolin (Co-TLC, m.m.p. and superimposable IR).

#### Compound H (betulinic acid) :

Compound H (1.0-g) has been identified as betulinic acid by direct comparison with an authentic sample (Co-TLC, m.m.p. and IR Spectra).

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### Chemical Investigation of Indigenous Plant Resources

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**T**HE present communication deals with the chemical investigation of *Pogestemon placranthoides* and *Hedychium coronarium*.

The plant *Hedychium coronarium* belongs<sup>1</sup> to family Scitamineae and is distributed throughout India. This plant is reported<sup>2,3</sup> to be very useful in paper making. It is also endowed with a number of medicinal properties<sup>4</sup>.

The plant *Pogestemon placranthoides* belongs<sup>5</sup> to family Labiatae and is known<sup>6</sup> to have good therapeutic utility. The use is made<sup>7</sup> of the plant ash as manure in paddy crop.

The preliminary pharmacological screening of the oil obtained from pet-ether extract of *Pogestemon placranthoides* revealed significant CNS depressant activity. This observation was substantiated by potentiation of sleeping time induced by hexobarbitone.

The oil from the pet-ether extract of *P. placranthoides* bracts gave, (i) an aliphatic hydrocarbon  $C_{30}H_{62}$ , m.p. 65°, (ii) Phytol, identified by comparison (IR) with an authentic specimen, (iii) Vanillin and (iv) 4-hydroxy-4-methyl-pentane-2-one, b.p. 54-60°/10 mm, NMR, 4 singlets at  $\delta$  1.2 (6H), 2.17 (3H), 2.6 (2H) and 3.92 (1H).

The presence of free phytol can be very significant in the light of its role<sup>8</sup> in the formation of Vit. K and anti-haemorrhagic activity possessed by the plant.

The comparison of the structure of 4-hydroxy-4-methyl-pentane-2-one with the known<sup>9</sup> biogenic precursors for terpenes made it immediately evident that this compound could also provide a sound base for the speculation on its nature as a building block in terpene synthesis.

Potassium chloride isolated from alcohol extract of the stems can account for the use of stem ash as manure in paddy crop.

The yellowish brown oil obtained from the rhizomes of *Hedychium coronarium*, by pet-ether extraction followed by steam distillation showed,  $d_{20} 0.9439$ ;  $n_D^{20} 1.501$ ;  $[\alpha]_D^{20} +1.20$ ; acid no. 7.73; ester No. 20.3. These constants differ from the constants given<sup>10-13</sup>, for the oil obtained by direct steam distillation of the plant material.

The column chromatography of ethanol extract of rhizomes of *Hedychium coronarium* afforded a furanoid diterpene, hedychanone, m.p. 134°,  $C_{20}H_{36}O_2$ . The IR, NMR and mass spectra agree well with those reported in literature<sup>14</sup>.

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