## SHORT COMMUNICATIONS

## Chemical Examination of *Flemingia chappar* Ham.—Occurrence of 2': 4'-dihydroxy-chalcone

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Two crystalline flavonoids and  $\beta$ -sitosterol have been isolated from the powdered whole plant of *Flemingia chappar* Ham. (Fam : Leguminosae). The present report relates to the characterisation of one of these flavonoids as 2': 4'-dihydroxychalcone, first to be reported from a plant source.

The compound,  $C_{15}H_{12}O_3$  (M<sup>+</sup> 240), m.p. 149-50°, crystallising from benzene as yellow needles, gave deep brown colouration with ferric chloride indicating its phenolic nature. The i.r. spectrum disclosed the presence of a chelated carbonyl peak (1640 cm<sup>-1</sup>), a broad phenolic band (3270 cm<sup>-1</sup>) and a complex aromatic substitution pattern. The u.v. spectrum  $(\lambda_{max}^{EOH}$  260, 320, 340 m $\mu$ ) was indicative of a chalcone system. The yellow compound was a chalcone as it readily isomerised to the corresponding flavanone in good yield on treatment with 1.5% aqueous sodium hydroxide followed by acidification. The transformation product of the chalcone,  $C_{15}H_{12}O_3$  crystallised from benzene as colourless plates, m.p. 189-90° and gave a deep red colour in the Shinoda reaction characteristic of flavanones.

The absence of a methoxyl (Zeisel) and a negative ferric reaction coupled with the ready solubility of the compound, m.p. 189–90°, in aqueous sodium carbonate indicated the presence of a phenolic –OH group *para* to a carbonyl function. The i.r. spectrum disclosed the presence of a strong conjugated carbonyl peak (1660 cm<sup>-1</sup>), a weak phenolic band (3200 cm<sup>-1</sup>) and a complex aromatic substitution pattern. The u.v. spectrum  $\lambda_{max}^{ElOH}$  231 (log  $\epsilon$  3.70), 277 (log  $\epsilon$  4.76), 312 m $\mu$  (log  $\epsilon$  3.56) appeared to be similar to that of 7 : 4'-dihydroxy-liquiritigenin and the displacement of the 231 m $\mu$  band by 10 m $\mu$  on addition of sodium acetate suggested that the –OH group might be situated at 7-position of the flavanone skeleton<sup>1</sup>.

Final confirmation as to the location of the -OH group in the 7-position was secured by synthesis of 7-hydroxyflavanone by the cyclisation of resorcinol with cinnamic acid in the presence of polyphosphoric acid following the method of Hassebe<sup>2</sup>.

The flavanone, m.p. 189-90°, obtained by the isomerisation of the natural chalkone was found to be identical with the synthetic 7-hydroxyflavanone (I) prepared aove<sup>2</sup> in all

 <sup>&#</sup>x27;The Chemistry of Flavonoid Compounds', Ed. T. A. Geissman, Porgamon Peress, Lndno, 1962. p. 151-53.

<sup>2.</sup> N. Hassebe, Nippon Kajaku Zasshi, 1961, 82, 1728; Chem. Abst., 1963, 59, 2761.

respects (m.p., m.m.p., u.v., and superimposable i.r. spectra). This settles the structure of the chalcone as (II).



Studies on the second flavonoid and other constituents are now under way.

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