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CHEMICAL COMPONENTS OF SHOREA TALURA

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Shorea talura is a lac host of regional importance and belongs to the family Dipterocarpaceae. Lac is produced on this host in both Madras and Mysore states. Its heartwood has now been examined as part of a programme of study of lac hosts.

The powdered heartwood was extracted with hot petroleum ether (60-80°) followed by ether and finally alcohol. The ether extract yielded a brownish solid (A) in a yield of 2.5% and its chemical study is discussed below in detail. The alcoholic extract on concentration and passing through a column of neutral alumina gave a small amount of compound B.

Compound A was first obtained as a sticky brown solid, but it could be turned into a powder by repeated maceration with dry benzene. Some further purification could be effected by dissolving it in ether and extracting the solution with aqueous sodium bicarbonate, carbonate and sodium hydroxide. Practically all the compound was removed by the carbonate extract and there was very little in the bicarbonate or hydroxide extract. By acidification of the carbonate solution, the substance could be recovered as a pale brown powder. Chromatographic purification on acid washed alumina or silica gel failed to yield a purer substance; crystallization was found to be difficult but could be achieved from a mixture of ethyl acetate - benzene. Found: C, 72.7; H, 5.2%. The compound did not melt below 360°. Though it was obviously phenolic, it gave no ferric reaction nor any of the characteristic colours of flavonoids, triterpenes or sugars.

It gives a marked red colour with concentrated sulphuric acid and a characteristic blue fluorescence in alcoholic solution in U.V. light; λ_{max}^{MeOH} 281 mμ (log ε , 4.25) would suggest the presence of phenolic groups. The IR spectrum contains no carbonyl absorption, but has aromatic absorptions with a prominent band at 830 cm^{-1} suggestive of 1:4 disubstituted benzene nucleus and also strong absorption in the hydroxyl region. The compound contains no methoxyl or methylene dioxy group. Its failure to undergo hydrolysis with 7% aqueous sulphuric acid combined with negative Molisch's test excluded the possibility of its being a glycoside.

The compound yielded easily crystallizable methyl ether. It was prepared by boiling with dimethyl sulphate and potassium carbonate in acetone medium. The IR spectrum of the methyl ether had no hydroxyl band showing that all hydroxyls are phenolic in nature. Molecular weight determination by the mass spectral method was not satisfactory because the compound decomposed, but by Rast method the apprximate value of 1013 was obtained. This result along with methoxyl value would indicate the presence of ten phenolic hydroxyl groups in the original compound.

A crystalline acetate could be obtained by acetic anhydride-pyridine method. The result of the acetoxyl estimation is also compatible with the presence of ten phenolic hydroxyl groups in the compound.

The following oxidation studies were carried out using the compound and its methyl ether: (a) alkali-nitrobenzene oxidation of compound A yielded p-hydroxy benzaldehyde; (b) concentrated nitric acid on compound A afforded picric acid; (c) the methyl ether was not affected by cold potassium permanganate in acetone, but alkaline potassium permanganate oxidation in hot acetone gave anisic acid.

The NMR spectrum of the methyl ether is remarkable in that no signal above 6.7 τ characteristic of aliphatic protons is observed. The absorptions are only in the methoxyl, olefinic and aromatic regions. The signals in the methoxyl region indicate the possibility of ten methoxyl groups. Of these two methoxyls are different from the rest in their environment because of comparatively higher field (6.7 τ) where they resonate. The other methoxyls give the signals between 6.25 to 6.4 τ. Two doublets at 4.1 and

5.1 τ with J = 2.5 cps integrating to 4 protons show the presence of two -CH = CH - in the methyl ether. The absorptions in aromatic regions are complex and splitting patterns are therefore difficult to interpret. Further work is in progress. Ethylenic linkages were not indicated clearly in the IR spectrum since the frequency seemed to merge with those of the aromatic ring.

Recently, a phenolic compound namely 'hopeaphenol' has been isolated from the heartwoods of *Hopea odorata* and *Balanocarpus heimii* (family: Dipterocarpaceae) and studied by Coggon *et al.*[1], though no definite structure has been proposed. There is considerable resemblence between this and our compound and especially in the high molecular weight, products of oxidation and UV, IR and NMR data. It is significant that *Shorea talura* belongs to the same family indicating that our compound is closely related to hopeaphenol.

Compound B: The alcoholic extract was concentrated and the crude solid was passed through a column of neutral alumina and eluted with alcohol. The pale yellow eluate deposited a colourless solid, m.p. 239-40°. The elemental analysis agreed with a molecular formula, $C_7H_{14}O_6$ and it did not show any optical activity. The IR spectrum showed the absence of aromatic absorption and the presence of strong absorption for hydroxyl. The compound B could be identified as sequoyitol - a mono methyl ether of inositol by mixed m.p. with authentic sample kindly provided by Prof.F.E.King.

REFERENCE

1. P. Coggon, N.F. Janes, F.E.King, T.J.King, R.J.Molyneux, J.W.W.Morgan and K.Sellars, *J. Chem. Soc.* 406 (1965).