A THESIS

entitled

CHEMICAL INVESTIGATIONS OF THE EXTRACTIVES OF SOME SPECIES OF THE FAMILIES GUTTIFERAE AND DIPTEROCARPACEAE

Presented by

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Synopsis

In this programme some species of the families Guttiferae and Dipterocarpaceae were investigated.

From the family Dipterocarpaceae, the resin of Doona macrophylla Thw and the bark and timber extractives of eight Stemonoporus Thw species were studied. The chemotaxonomic correlations and possible biogenetic significance of the different compounds isolated are discussed.

Three species of the family Guttiferae namely, Mammea acuminata Calophyllum tomentosum Wight and Calophyllum trapezifolium Thw were investigated. The isolation characterisation and the possible biogenetic and the possible chemotaxonomic significance of the compounds in the bark and timber extractives of these plants are discussed.

The earlier work on these families, the distribution and biogenetic pathways of these plants products are reviewed in the introduction.

Stemonoporus lancifolius Thw.

δ-Amyrenone, α-amyrin, ursonic acid, ursolic acid β-sitosterol and β-sitosteryl o-methoxy benzoate were characterised from the bark and timber extractives. The bark extractives had in addition an isocoumarin bergenin.

Stemonopours affinis Thw

δ-Amyrenone, α-amyrin, ursonic acid, ursolic acid, β-sitosterol and β-sitostryl-o-methoxybenzoate were characterised from the bark and timber extractives. Bergenin was isolated from the bark extractives in addition to the compounds mentioned above.

Stemonoporus cordifolius Thw

δ-Amyrenone, α-amyrin, ursolic acid and β-sitosterol were characterised from the bark and timber extractives. $\lambda\alpha$-Hydroxy ursolic acid and β-sitosteryl-o-methoxybenzoate were also characterised from the bark.

Stemonoporus elegans (Thw) Alston

δ-Amyrenone, α-amyrin, ursolic acid, β-sitosterol and β-sitosteryl o-methoxy benzoate were characterised from both the bark and timber extractives. The bark extractives had in addition acetyl ursolic acid while 4-hydroxy benzaldehyde and methyl 2,4-dihydroxy benzoate were isolated from the timber extractive.

Stemonoporus oblongifolius Thw

δ-Amyrenone, α-amyrin, ursonic acid, ursolic acid, acetyl ursolic acid β-sitosterol and β-sitosteryl o-methoxybenzoate were characterised from the bark extractives.

Stemonoporus petiolaris Thw

δ-Amyrenone, α-amyrin, ursonic acid, ursolic acid β-sitosterol and bergenin were characterised from the bark extractives. T.l.c. analysis of the timber extractives were carried out and the presence of β-sitosteryl o-methoxy benzoate, β-sitosterol, δ-amyrenone, α-amyrin, ursonic acid, ursolic acid, and acetyl ursolic acid were detected.

Stemonoporus reticulatus Thw.

δ-Amyrenone, α-amyrin, ursonic acid, ursolic acid, 2α-hydroxyursolic acid β-sitosterol, β-sitosteryl o-methoxy benzoate were observed to be present in both the bark and timber extractives by thin layer chromatography. Bergenin was also detected in the bark extractives by t.l.c.

Stemonoporus canaliculatus Thw.

T.l.c. analysis of the bark and timber extractives showed the presence of δ-amyrenone, α-amyrin, ursolic acid, β-sitosterol and β-sitosteryl-o-methoxy benzoate. Presence of ursonic acid in timber extractives and bergenin in the bark extractives were also detected by t.l.c.

The chloroform extract of the timber of S. canaliculatus on t.l.c. revealed the presence of the ester of β-sitosterol, δ-amyrenone, α-amyrin, β-sitosterol, ursonic acid, ursolic acid.

The chloroform extract of the bark S. reticulatus showed on t.l.c. the presence of the ester of β-sitosterol, δ-amyrenone, α-amyrin, β-sitosterol, ursonic acid, ursolic acid and 2α-hydroxy ursolic acid.

The methanol extract of the bark showed the presence of bergenin on t.l.c.

The chloroform extract of the timber of S. reticulatus on t.l.c. showed the presence of the ester of β-sitosterol, δ-amyrenone, α-amyrin, ursonic acid, ursolic acid and 2α-hydroxy ursolic acid.

Mammea acuminata

1-Hydroxy-7-methoxyxanthone, 2-methoxyxanthone, 2-hydroxyxanthone, 4-hydroxyxanthone, 1,5-dihydroxyxanthone, 1,7-dihydroxyxanthone, 2-methoxy-3-hydroxyxanthone, 2,6-dihydroxyxanthone, 1-methoxy-5-hydroxyxanthone, and β-sitosterol were characterised from the timber. The bark extractives contained the terpenes glutinol and glutinone. This is the first report of these two triterpenes from this family. 2,6-dihydroxyxanthone is reported for the first time from a natural source. Coumarin fraction isolated was sent for G.C-M.S analysis.

Calophyllum tomentosum Wight

6-Deoxyjacareubin, 1,5-dihydroxyxanthone, 1,7-dihydroxyxanthone, jacareubin, 1,6-dihydroxy-5-methoxyxanthone, 2(3-methylbut-2-enyl)-1,3,5-trihydroxyxanthone, β-sitosterol, epifriedelinol, friedelin and taraxerol were characterised from the timber. Betulinic acid, epifriedelinol, friedelin, taraxerol, taraxerone β-sitosterol and calabaxanthone were characterised from the bark extractives.

Calyophyllum trapezifolium Thw.

1,6-Dihydroxy-5-methoxyxanthone, 6-deoxyjacareubin, 1,5-dihydroxyxanthone, 1,7-dihydroxyxanthone, 2-hydroxyxanthone, jacareubin and β-sitosterol were characterised from the timber extractives.

Betulinic acid, calabaxanthone, taraxerone, taraxerol, friedelin, epifriedel incl were characterised from the bark along with a prenylated dihydroxyxanthone TSB 1 which is a new natural product and a bark acid which was not further investigated.