D-08: A preliminary study of secondary metabolites in selected families

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In addition to primary metabolites higher plants synthesize a variety of compounds known as secondary metabolites. The applications of secondary metabolites are many. During recent years they have been used in tracing affinities between various taxa. In this study, an attempt was made to screen mature leaves of selected families for the presence of major classes of secondary metabolites such as alkaloids, terpenoids, phenolics and cyanogenic glycosides.

The family representatives were collected from Kandy and the Sinharaja forest. Fresh mature leaves (200g) were collected randomly in plastic bags and were air dried for about 1 week and powdered. A methonolic extract of this powder was used for screening of terpenoids, phenolics and alkaloids. Fresh leaves of the family Flacourtiaceae were used for screening cynagenic glycosides.

Screening for phenolic compounds was done by acid hydrolysis followed by addition of diethyl ether. The organic layer was collected, concentrated and developed on a Thin Layer Chromatography (TLC) plate, using a suitable solvent system. The plates were observed under UV exposure and by spraying vanillin reagent. Screening for saponins was done by detecting froth. Unsaturated sterols and triterpenes were detected by Lieberman Burchard and Salkwoski tests. Alkaloids were detected by separating the free alkaloids from quaternary alkaloids and developing on TLC plates. They were confirmed by spraying Dragendorff reagent and quaternary alkaloids with Mayer's reagent. Cyanogenic glycosides were detected by alkaline picrate paper method.

Representatives of Family Dipterocarpaceae (*Shorea oblongifolia, Shorea zeylanica, Hopea odorata, Hopea jucunda* ssp. *jucunda*), Apocynaceae (*Alstonia macrophylla*), Annonaceae (*Artobotrys zeylanicus,Xylopia championii*) and Flacourtiaceae (*Hydnocarpus venenata, Scolopia acuminata, Scolopia schreberi, Homalium zeylanicum, Trichadenia zeylanica, Flacourtia inermis, Flacourtia catphracta*) were screened for secondary metabolites in this study.

Six spots given by extracts of *Alstonia macrophylla* a (Apocynaceae) on TLC plate indicates the presence of at least 6 alkaloids. *Artabotrys zeylanicus* (Annonaceae) gave positive results but the number of spots were not clear. This may be due to the presence of closely related alkaloids with minor differences. Therefore they do not separate clearly and tend to run into one another. Appearance of 5 spots in *Xylopia championii* (Annonaceae) indicates the presence of at least 5 different types of alkaloids. All these spots fluoresced under UV light indicating the presence of conjugated systems or rigid ring structures.

All 4 Dipterocarps gave positive results for phenolics.All had 3 spots in common and *Hopea odorata* and *Shorea oblongifolia* has a spot in common while *Hopea odorata* has one spot only for itself. All these spots fluoresced under UV light. Saponins were present in all 4 Dipterocarps indicated by frothing. *Shorea zeylanica* and *Shorea oblongifolia* were richer in saponins than the others.

Frothing was less in representatives of Apocynaceae indicating saponins in minor amounts. Saponins were absent in Annonaceae. *Hydnocarpus veneata* and *Trichoderma zeylanica* gave positive results with picrate paper indicating the presence of cyanogenic glycosides, while the others were negative.

Dipterocarpaceae seems to be a family rich in phenolics and saponins, whereas Apocynaceae and Annonaceae were found to be rich in alkaloids. Family Flacourtiaceae is not rich in cyanogenic glycosides. This study indicates the distribution of secondary metabolites in 4 families.

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