The reaction of 4-chloro-3', 4'-dimethoxychalkone, m.p. 118° and 3' 4', 4-trimethoxychalkone, m.p. 85° with nitromethane in methanolic solution in presence of sodium gave adducts of the following general structure: 8 (B).

\[
\begin{align*}
R &= 4-\text{Cl}, \quad R' = 3', 4' \text{(OMe)}_2 \text{ (benzene)}, \text{ m.p. } 120°, \\
R &= 4-\text{OMe}, \quad R' = 3', 4' \text{(OMe)}_2 \text{ (benzene) } \text{m.p. } 118°.
\end{align*}
\]

When 4-methoxy- and 4-methyl- chalkones were treated with methyl magnesium iodide, compounds of the general structure (C) shown were obtained. The i.r. spectra showed a carbonyl band around 1685 cm⁻¹.

\[
\begin{align*}
R &= \text{CH}_3; \quad R' = 4-\text{OCH}_3 \text{, m.p. } 72° \text{ (dil. alcohol)}. \\
R &= \text{CH}_3; \quad R' = 4-\text{CH}_2, \text{ b.p. } 200-205°/2 \text{ mm}.
\end{align*}
\]

The oxidation of 4-methyl and 4-methyl chalkones with thallium (III) nitrate in presence of glyme and perchloric acid (70%) afforded diketones of the structure shown in (D).

\[
\begin{align*}
R &= 4-\text{CH}_3, \text{ m.p. } 136-37° \text{ (yellow needles, from alcohol)}. \\
r &= \text{H}, \quad R' = 4-\text{CH}_3, \text{ m.p. } 140° \text{ (colourless needles from alcohol)}.
\end{align*}
\]

All compounds gave satisfactory analysis for C, H and N whenever present.

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ISOSCUTELLARIN AND OTHER POLYPHENOLS FROM THE LEAVES OF STERCULA FOETIDA

Sterculia foetida L. (family: Sterculiaceae) recorded to contain a mitogenic principle, sterculic acid present as its methyl ester has not been systematically examined for its polyphenolic components. In continuation of our isolation of 6-O-β-D-glucuronyl luteolin from S. colorata, we have examined the leaves and flowers of S. foetida, and the results are recorded here.

Fresh leaves were extracted with hot 95% EtOH under reflux and the residue in the concentrate was fractionated by solvent extraction. The ethyl acetate as well as ethyl methyl ketone extracts on concentration yielded a creamy white solid, not melting below 320° (with blackening at about 220°). It was insoluble in ether and acetone, soluble in MeOH, laevorotatory, \( \lambda_{\text{max}} \) 280 nm and gave an olive green colour with Fe³⁺. It developed a pink colour with hot HCl, and on hydrolysis (3N HCl in MeOH medium, 1 hr) yielded cyanidin chloride and D-glucuronic acid. It also underwent hydrolysis with β-glucuronidase. The compound was thus identified as a procyanidin-β-D-glucuronide.

The mother liquor, after the removal of the procyanidin, on PC indicated the presence of two flavone glycosides. They were separated by fractional crystallisation (MeOH-Me₂CO) followed by preparative PC. The major component (more soluble in MeOH-Me₂CO) had no sharp m.p. (decomposition started from 230°), was purple under U.V. and U.V./NH₃, gave olive green colour with Fe³⁺ and yellow with alkalis. It had \( \lambda_{\text{max}} \) (nm) 249 sh., 268, 340 (MeOH); 280, 322 sh., 375 (NaOAc) and 265, 345 (NaOAc/H₂BO₃) \( \lambda_{\text{max}} \) (KBr) 3400 (br., multiple OH), 2910, 1715; 1650 (carbonyl), 1610, 1570, 1500, 1440 (aromatic ring) 1380; 1300, 1255, 1210, 1185 (phenolic OH); 1140, 1105, 1060, 1050; 1090, 925 (glycoside moiety), 845, 800 and 760 cm⁻¹ (substituted benzene) and Rf: (x100, Whatman No. 1, ascending 27 ± 2°) 54 (H₂O), 22 (15% HOAc), 42 (30% HOAc), 61 50% HOAc), 35 (BAW), 62 (phenol), 72 (Forestal) and 53 (B-BAW). On acid as well as enzyme (β-glucuronidase) hydrolysis, it yielded scutellarein (4', 5, 6, 7-tetrahydroxy flavone) and D-glucuronic acid in equal molar ratio. Hence, it was identified as a scutellarein mono-glucuronide. From the colour reactions, UV fluorescence and spectral data,
glycosylation was taken to be at A-ring and most probably at C-6. A direct comparison of the compound with scutellarin (7-O-β-D-glucuronyl scutellarein) (IR, Rf, and co-PC) showed them as different and hence the new glycoside was identified as 6-O-β-D-glucuronyl scutellaran, designated isoscutellarin. The other minor glycoside was identified as 6-O-β-D-glucuronyl luteolin by λmax, Rf, acid and enzyme hydrolysis and direct comparison including co-PC with an authentic sample from S. colorata.

The purple colored flower petals were extracted with 0.01 N methanolic HCl and concentrated in vacuo below 40°C. The dark purple solid was crystallised from methanolic HCl-ether. It was homogenous on PC, did not melt up to 320°C, and yielded cyanidin chloride and glucose on hydrolysis. It was identified as cyanidin-3-O-glucoside by Rf and co-PC with an authentic sample.

This is the first record of occurrence of 6-O-β-D-glucuronyl scutellaran, an isomer of scutellarin; S. foetida containing isoscutellarin and 6-O-β-D-glucuronyl luteolin resembles S. colorata containing the latter with scutellarin but differs from it in having significant quantity of the procyanidin glucuronide. The presence of 6-oxygenated flavones in Sterculia sp. is significant from the point of molecular taxonomy of the Natural Order Malvales.

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TOXICITY OF PARTHENIUM HYSTEROPHORUS L.

Parthenium hysterophorus L. an alien weed now growing wild in many parts of India is posing agricultural and health hazards. It has been shown to cause allergic contact dermatitis in humans. Agriculturalists in Maharashtra and Karnataka are expressing concern over the invasion of food and fodder crop fields by this weed. Since livestock grazing in open fields have access to the weed it is of interest to know whether Parthenium has any after effects after ingestion. We have undertaken a detailed investigation on the toxicology of Parthenium to animals and the present report describes our initial findings on the toxicity of the weed to livestock.

During our field survey it was found that goats graze on P. hysterophorus freely while cattle and buffaloes appeared to graze sparingly. Under laboratory conditions we found that both buffalo bull calves and cross bred bull calves freely feed on Parthenium either as such or after admixture with conventional green fodder. When nine buffalo bull calves and seven cross bred bull calves were fed on the weed mixed with green fodder ad libitum, they developed toxic symptoms resulting in the death of six buffalo bull calves and five cross bred bull calves within periods ranging from 8 to 30 days after feeding. All the buffalo calves developed severe dermatitis on face, base of the ears, shoulders, neck, back, loins and on legs extending down to hock and knee joints. Autopsy of the animals revealed gross and microscopic lesions in the gastrointestinal tract, liver and kidney. Control animals fed on conventional green fodder remained healthy and showed none of these external symptoms.

It is increasingly realized that parthenin, the major sesquiterpene lactone present in P. hysterophorus is responsible for allergic contact dermatitis of humans by this weed. It is also reported that sesquiterpene lactones from certain members of Compositae family to which Parthenium also belongs, are toxic to livestock. In our present studies it was found that subconjunctival and intracorneal tests with an aqueous solution of parthenin (0.1% w/v) showed that the dermatitis manifested by Parthenium-fed animals was of allergic nature involving Type IV hypersensitivity. Further experiments to assess the possibility of excretion of parthenin and other toxic principles from the injected weed by livestock through milk and their impact on human health are under way. The details of these studies will be published elsewhere.

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