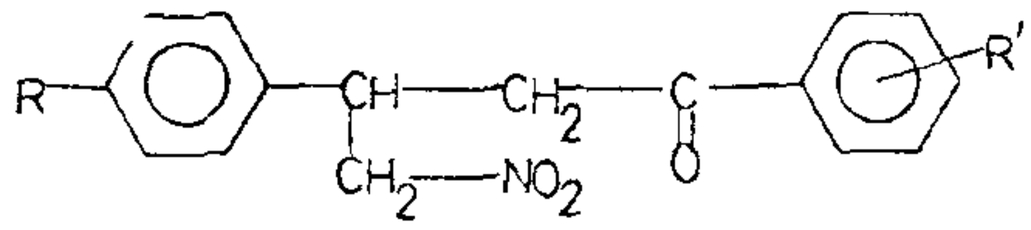
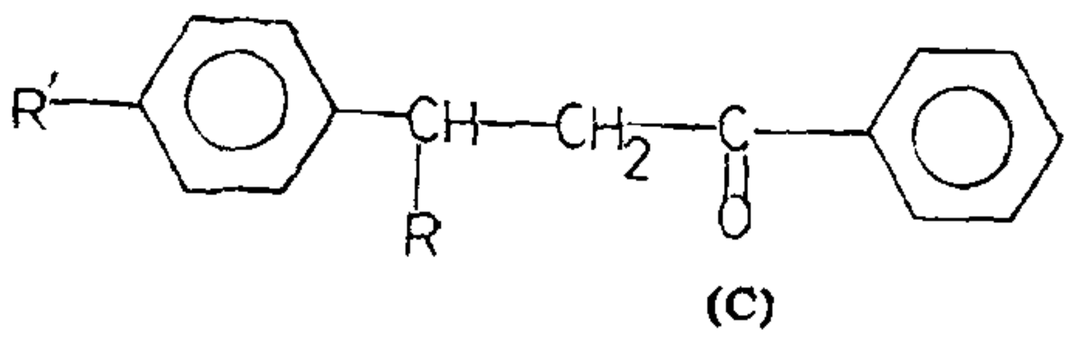
The reaction of 4-chloro-3', 4'-dimethoxychalkone, m.p. 118° and 3' 4', 4-trimethoxychalkone, m.p. 85° with nitromethane in methanolic solution in presence of sodium gave adducts of the following general structure[2,3] (B).



(B)

R = 4–Cl, R' = 3', 4' $(OMe)_2$ (benzene), m.p. 120°.
R = 4–OMe, R' = 3' 4' $(OMe)_2$ (benzene) m p. 118°.

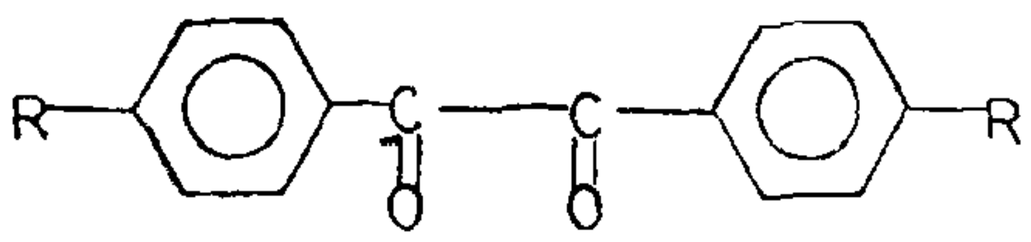
When 4-methoxy- and 4-methyl- chalkones were treated with methyl magnesium iodide, compounds of the general structure (C) shown were obtained[4]. The i.r. spectra showed a carbonyl band around 1685 cm^{-1}.



(C)

$R = CH_3$; R' = 4–OCH_3, m.p. 72° (dil. alcohol).
$R = CH_3$; R' = 4–CH_3, b.p. 200–205°/2 mm.

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[5] shown in (D).



(D)

R = 4–CH_3, m.p. 136–37° (yellow needles, from alcohol).
r = H, R' = 4–CH_3, m.p. 140° (colourless needles from alcohol).

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

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ISOSCUTELLARIN AND OTHER POLYPHENOLS FROM THE LEAVES OF *STERCULIA FOETIDA*

Sterculia foetida L. (family : Sterculiaceae) recorded[1] 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*[2], 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, λ_{max} 280 nm and gave an olive green colour with Fe^{3+}. 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–Me_2CO) followed by preparative PC. The major component (more soluble in MeOH–Me_2CO) had no sharp m.p. (decomposition started from 230°), was purple under U.V. and U.V/NH_3, gave olive green colour with Fe^{3+} and yellow with alkalis. It had λ_{max} (nm) 249 sh., 268, 340 (MeOH); 280, 322 sh., 375 (NaOAc) and 265, 345 (NaOAc/H_3BO_3) ν_{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, 1020; 1000, 925 (glycoside moiety), 845, 800 and 760 cm^{-1} (substituted benzene) and R_f: (×100, Whatman No. 1, ascending 27 ± 2°) 54 (H_2O), 22 (15% HOAc), 42 (30% HOAc), 61 50% HOAc), 35 (BAW), 62 (phenol), 72 (Forestal) and 53 (*t*-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, R_f and co-PC) showed them as different and hence the new glycoside was identified as 6-O-β-D-glucuronyl scutellarein, designated isoscutellarin. The other minor glycoside was identified as 6-O-β-D-glucuronyl luteolin by λ_{max}, R_f, acid and enzyme hydrolysis and direct comparison including co-PC with an authentic sample from *S. colorata*[2].

The purple coloured 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 upto 320°, and yielded cyanidin chloride and glucose on hydrolysis. It was identified as cyanidin-3-O-glucoside by R_f and co-PC with an authentic sample.

This is the first record of occurrence of 6-O-β-D-glucuronyl scutellarein, an isomer of scutellarin; *S. foetida* containing isoscutellarin and 6-O-β-D-glucuronyl luteolin resembles *S. colorata* containing the latter with scutellarein 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[1,2]. Agriculturists 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 an 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 buffaloe bull calves and cross bred bull calves freely feed on *Parthenium* either as such or after admixture with conventional green fodder. When nine buffaloe 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 buffaloe bull calves and five cross bred bull calves within periods ranging from 8 to 30 days after feeding. All the buffaloe 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 gastro-intestinal 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[3]. It is also reported that sesquiterpene lactones from certain members of Compositae family to which *Parthenium* also belongs, are toxic to livestock[4]. In our present studies it was found that subconjunctival and intracorneal tests[5] 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 injested 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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