

(CHCl₃) 235, 268, 288 and 382 nm; δ (CDCl₃ with TMS as internal standard) 2.34 (3H, s, ArCH₃), 3.9 (3H, s, OCH₃), 6.8 (7H, m, ArH), 6.75 (1H, s, C-H), 11.96 (1H, s, O-H, 80%) and 4.56 (2H, s, CH₂, 20%); showed the keto-enol tautomerism in β -diketone (80%) enol and (20%) ketone.

Similarly 3b-d were prepared from the corresponding esters. Analysis was in accordance with the required molecular formula.

Reaction of 3a-d with hydroxylamine hydrochloride in DMF-water medium: 2-Hydroxy-4'-methoxy-5-methyldibenzoylmethane (3a; 5 mmol, 14 g) and hydroxylamine hydrochloride (10 mmol, 0.7 g) were dissolved in DMF-water mixture. The solution was refluxed for 4 h, cooled and diluted with water. The gummy mass separated was washed several times with water and triturated with rectified spirit to get a white powder. It was boiled with carbon tetrachloride and insoluble product was separated to get 5a, m.p. 205° (Found: C, 70.0; H, 6.4. C₁₇H₁₆O₃N₂ calcd. for: C, 70.50; H, 6.84%); R_f 0.27 in benzene ν_{max} 3450 (OH), 3100 (NH), 1620 (C=N, C=C), 1310 (O-CH), 1260 (Ar-O ether), 1180 (C-O), 1040 (OCH₃), 980 (=N-O) and 800 cm⁻¹ (=C-H); λ_{max} 220, 269 and 313 nm; δ 1.56, 2.36, 3.90, 6.46, 6.8-8.0 (1H, s, OH; 3H, s, ArCH₃; 3H, s, OCH₃; 1H, s, NH; 8H, m, Ar-H; and olefinic =C-H).

The carbon tetrachloride solution on evaporation gave another product which was crystallised from rectified spirit to get 4a, m.p. 150° (Found: C, 72.32; H, 6.39. C₁₇H₁₅O₃N calcd. for: C, 72.6; H, 6.3%); ν_{max} 3210 (OH), 1630, 1620 (C=N, C=C), 1310 (OCH), 1265 (Ar-O ether), 1020 (O-CH₃), 950 (=N-O) and 790 cm⁻¹ (=C-H); δ 2.4, 3.94, 6.83, 6.90, 7.90 and 9.44 (3H, s, ArCH₃; 3H, s, OCH₃; 1H, s, heteroaromatic; 7H, m, Ar-H; 1H, s, O-H).

Similarly, 3b-d gave 4b-d and 5b-d (Table 1).

Reaction of 3a-d with hydroxylamine hydrochloride in DMF/N-methylacetamide: The reaction was carried out as above. 4a-d and 5a-d were isolated and the comparative yields tabulated. Only 3a was taken to study the reaction in N-methylacetamide.

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Triterpenoids and other Constituents of *Acacia tortilis* Wild.

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THE plant *Acacia tortilis* Wild. (Syn: *A. Radlana* Savi) and commonly known as Israeli babul (Leguminosae) was collected from the Northern semi-desert region of Rajasthan in January and was identified in the herbarium (No. 20292) Botany Department, University of Rajasthan, Jaipur. It was found to be very useful source of protein¹. The cellwall constituents, acid detergent fibres and cellulose found in the leaves provide as nutrients for the animals as fodders. Seeds contain organic matter and protein. Apigen-6,8-d-glucoside and rutin were isolated from the leaves². It was therefore, considered worth while to investigate the plant for its chemical compositions.

Stem-bark: Air-dried and finely chipped stem-bark of *A. tortilis* (4 kg) was exhaustively extracted with petroleum ether (b.p. 60-80°) and acetone, respectively. The petroleum ether extract concentrate (47 g) was chromatographed over silica gel (60-100 mesh), being eluted with petroleum ether, benzene, ethyl acetate, and methanol mixtures of increasing polarity. The identity of the compounds obtained has been established from their physical properties (m.p., m.m.p., co-tlc and co-ir) and in every case through the preparation of derivatives.

The petroleum ether extract gave (A) n-hexacosanol, m.p. 78° (lit³. 79°); acetate, m.p. 64° (lit³. 66°), (B) betulin, m.p. 250° (lit⁴. 251-52°); diacetate, m.p. 215-16° (lit⁵. 217°); dibenzoate, m.p. 178-79° (lit⁶. 182°), and (C) α -amyrin, m.p. 185-86° (lit⁷. 186°), acetate, m.p. 223° (lit⁸. 223-25°); benzoate, m.p. 193° (lit⁸. 193-94°).

The acetone extract gave (D) n-hexacosanol, m.p. 78° (lit³. 79°), acetate, m.p. 64° (lit³. 66°), (E) β -sitosterol, m.p. 136-37° (lit⁹. 136-37°); acetate, 125-26° (lit⁹. 126-27°); benzoate, m.p. 143-44° (lit⁹. 144°), (F) β -amyrin, m.p. 196-97° (lit¹⁰. 197-5°); acetate, m.p. 237° (lit¹¹. 238-39°), benzoate, m.p. 228° (lit¹¹. 229-30°).

Heart-Wood: The chipped heart-wood (3 kg) was exhaustively extracted with petroleum ether (b.p. 60-80°) and then with chloroform. The combined extract (34 g) was chromatographed over silica gel (60-100 mesh) and eluted with the solvents of increasing polarity.

The following compounds were obtained, (G) n-octacosanol, m.p. 85° (lit¹². 83-4°); acetate m.p. 65° (lit¹². 65-8°), (H) 3-acetyl- β -sitosterol, m.p.

126° (lit.¹⁴ 126–27°); hydrolysis afforded β -sitosterol, (I) γ -sitosterol, m.p. 145° (lit.¹⁵ 146°); acetate m.p. 142° (lit.¹⁶ 143°), (J) betulin, m.p. 249°; diacetate m.p. 215–16°; benzoate, m.p. 18–7° (K) friedelin, m.p. 260° (lit.¹⁷ 260–62°); benzoate 258–60°; (lit.¹⁸ 255–63°).

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Isolation of Kaempferol and Velutin from *Trifolium alexandrinum* (Leguminosae)

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COUMESTROL and phytoestrogens¹ have already been reported in *Trifolium alexandrinum*²; and since there are reports about the occurrence of

flavones in leguminosae species³, hence the *T. alexandrinum* was investigated for the presence of kaempferol and velutin.

Experimental

A 95% ethanolic extract of air-dried plant was successively extracted with non-polar to polar reagents. Water-soluble part of the ethyl acetate fraction gave two spots on tlc and then subjected to column chromatography to get the compounds A B which gave the positive test for flavones⁴.

Compound-A: Yellow needles, m.p. 275–277° (Found: C, 62.84; H, 3.43. C₁₅H₁₀O₆ calculated for: C, 62.86; H, 3.48%); λ_{max} (MeOH) 264, 323, 361, + NaOMe 272, 320, 414 + AlCl₃ 260, 268, 308, 355, 429, + AlCl₃/HCl, 255, 270, 310, 350, 429 + NaOAc 275, 305, 360, + NaOAc/H₃BO₃ 264, 300, 328 and 380 nm; ν_{max} (KBr) 3580, 2915, 1680, 1590, 1440, 1260, 1130 and 825 cm⁻¹; δ (CDCl₃) 2.12 (s, C₄-OAc), 2.32 (s, C₇-OAc), 2.40 (s, C₃-OAc), 2.43 (s, C₅-OAc), 6.72 (d, J 2.5 Hz C₆-H), 7.35 (d, J 1.3 Hz, C₈-H, C₅-H) and 7.42 (d, J 2.8 Hz, C₈-H); M⁺ 286; m/e 285, 258, 153, 152, 134 and 124. Thus it was identified as 3,4',5,7-tetrahydroxyflavone (kaempferol),

Compound-B: M.p. 223–25° (Found: C, 64.98; H, 4.55. C₁₇H₁₄O₆ calcd. for: C, 64.93; H, 4.52%); λ_{max} (EtOH) 264, 350, + AlCl₃ 266, 385, + NaOEt 290 and 394 nm; ν_{max} (KBr) 3430, 2945, 2855, 1170, 1655, 1600 and 850 cm⁻¹; δ (CDCl₃) 3.82 (s, C₇-OMe), 3.90 (s, C₈-OMe) 6.32 (d, J 2.5 Hz, C₆-H), 6.70 (d, J 2.8 Hz, C₅-H), 6.92 (s, C₅-H), 2.43 (s, C₅-OAc), 7.60 (dd, J 2.5, 8.5 Hz C₂-H, C₆-H), 2.13 (s, C₄-OAc) and 7.1 (d, J 8.5 Hz, C₂'-H). Thus it was identified as 5,4'-dihydroxy-7,3'-dimethoxyflavone (velutin).

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