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TRITERPENOID AND OTHER CONSTITUENTS OF *XANTHORHIZA SIMPLICISSIMA*

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Key Word Index— *Xanthorhiza simplicissima* Ranunculaceae, ferulic acid fatty acids ursolic acid *n*-alkanes, sitosterol campesterol stigmasterol cholesterol, palmatine

Plant Xanthorhiza simplicissima Marsh *Source* S B Penick and Co, New York Lot No 814-BKM-1 *Uses* Has been used as a medicinal in the United States [1] *Previous work* On rhizomes and roots [2,3]

Present work The dried, ground rhizomes and roots (10 kg) were extracted by percolation with EtOH After removal of the solvent *in vacuo* at 40 , the residue (1 2 kg) was partitioned between 2% aq citric acid and Et_2O to give a basic and non-basic fraction The non-basic fraction was fractionated by standard methods into neutral (55 g), acidic (40 g) and phenolic (9 g) fractions

Phenolic fraction Chromatography over silicic acid and elution with $CHCl_3$ gave a fraction which, when re-chromatographed over silicic acid and eluted with $CHCl_3$-MeOH (4 1) afforded *ferulic acid* (60 mg) m p 165 5 166 5° (light petrol) λ_{max}^{MeOH} 216 nm (log ϵ 4 22) 234 (4 17), 295 (4 23), 320 (4 35) ν_{max}^{KBr} 3460, 1670, 1600, 1510 and 1270 cm^{-1} MS M^+ *m/e* 194 (100%), 179 (24), 177 (10) 150 (14) Direct comparison (m p m m p UV IR and MS) with an authentic sample confirmed the identity

Acidic fraction Chromatography over silicic acid and elution with light petrol -C_6H_6 (4 1) gave a fatty acid fraction which crystallized from MeOH (200 mg), m p 70–71 ν_{max}^{KBr} 2940, 2860, 1700 1460, 1300 and 720 cm^{-1} GLC of the methyl esters on a 160 cm column of 0 8% OV-17 on Gas Chrom Q (80–100 mesh) showed the mixture to be composed of C_{22} (24%), C_{23} (15), C_{24} (46), C_{25} (8) and C_{26} (6) saturated straight fatty acids The identity was confirmed by GC-MS

Elution with C_6H_6-$CHCl_3$ (1 3) gave *ursolic acid* (150 mg), m p 242–243 (light petrol MeOH) (lit[4] 224–244° [ether] 260–280° [EtOH] 280–281 [Et_2O–light petrol]) ν_{max}^{KBr} 3450, 2950, 2890, 1685, 1450 1030 and 990 cm^{-1}, $[\alpha]_D^{29}$ + 70° (c 0 4 $CHCl_3$) MS M^+ 456 (3%), 248 (100) Treatment with acetic anhydride-pyridine gave *O-acetylursolic acid* m p 268–270° (light petrol) ν_{max}^{KBr} 1735, 1690 and 1234 cm^{-1}, $[\alpha]_D^{29}$ + 53 7 (c 0 7 $CHCl_3$) Direct comparison (m p, m m p, IR, MS) with an authentic sample of the compound and derivative confirmed the identity

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[1] COOK F F and LAWALL C H (1926) *Remington's Practice of Pharmacy* 7th Edn p 1165 Lippincott Philadelphia Pa

[2] HUSSEIN F T BEAL J L and CAVA M P (1963) *Lloydia* **26**, 254

[3] KNAPP J E HUSSEIN F T BEAL J L DOSKOTCH R W and TOMIMATSU T (1967) *J Pharm Sci* **56**, 139

[4] ALALDIN M BRYCE T A CLAYTON E MARTIN-SMITH M and SUBRAMANIAN G (1955) *J Chem Soc* 4611

Neutral fraction Chromatography over silicic acid and elution with light petrol gave an alkane fraction which crystallized from MeOH (75 mg), m p 65–65 5°, ν_{max}^{KBr} 2930, 2860, 1460, 725 and 715 cm^{-1} GLC on a 160 cm column of 0 8% OV-17 on Gas Chrom Q (80–100 mesh) showed the mixture to be composed primarily of C_{25} to C_{35} *n-alkanes*, C_{25} (1%), C_{26} (2), C_{27} (6), C_{28} (4), C_{29} (20), C_{30} (5), C_{31} (25), C_{32} (4), C_{33} (19), C_{34} (2), C_{35} (1) The identity was confirmed by GC–MS Elution with light petrol–C_6H_6 (2 3) gave a sterol mixture which crystallized from MeOH (400 mg), m p 136–137° ν_{max}^{KBr} 3450, 2960, 1460, 1375 and 1060 cm^{-1} GLC on a 160 cm column of 0 8% OV-17 on Gas Chrom Q (80–100 mesh) showed the mixture to be composed of *sitosterol* (55%), *campesterol* (32), *stigmasterol* (9) and *cholesterol* (4) The identity was confirmed by GC–MS The spectra were consistent with those of authentic samples

Basic fraction Refrigeration of the acidic solution gave an alkaloidal precipitate (157 g) Chromatography over silicic acid and elution with $CHCl_3$–MeOH afforded an alkaloid fraction (1 2 g) Treatment with saturated methanolic KI gave *palmatine iodide* (60 mg), m p 228–229° λ_{max}^{MeOH} 227 nm (log ε 4 58), 270 (4 42), 350 (4 41) and 439 (3 71) ν_{max}^{KBr} 1600, 1360, 1270 and 1020 cm^{-1} MS M^+ *m/e* 352 (8%), 351 (17), 337 (95) and 142 (100) Reduction with $NaBH_4$ gave *tetrahydropalmatine* m p 142° (MeOH) λ_{max}^{MeOH} 209 (log ε 4 02) and 282 (3 78) MS M^+ 355 (40%), 339 (40), 164 (100) and 149 (50) Direct comparison (m p, m m p, IR, MS) with an authentic sample of the compound and derivative confirmed the identity The previously isolated compounds, *jatrorrhizine*,[2] *oxyacanthine*[3] and *obamegine*[3] were re-isolated and identified by m p, m m p, IR, MS and optical rotation

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ALCALOIDES DE *BAUERELLA BAUERI*

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Key Word Index—*Bauerella bauerı*, Rutaceae, acridones, acronycine, melicopidine

La plante Baurella bauerı (Schott) Engler Cette espèce a été récoltée le 10 septembre 1968 à Pouembout (Nouvelle Calédonie) par Sevenet et McKee Elle fait encore l'objet