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SCUTELLAREIN AND PECTOLINARINGENIN FROM THE LEAVES OF *CLERODENDRON PHLOMIDES* AND *DURANTA REPENS*

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Key Word Index—*Clerodendron phlomides*; *Duranta repens*; Verbenaceae; flavonoids; scutellarein; pectolinaringenin.

Plant. Clerodendron phlomides L. (Voucher specimen No. 2/72 deposited at JIPMER) collected from Botanic Gardens, Pondicherry. *Uses.* Medicinal. *Previous work.* Ceryl alcohol and sterols from leaves;[1] on sister species.[2–6]

Present work. Flavonoids of the leaves. The aq. alcoholic concentrate fractionated into benzene, ether and EtOAc soluble fractions.

Ether fraction. (a) Scutellarein (5,6,7,4′-tetrahydroxy flavone) (m.p., λ_{max}, tetra-acetyl, direct comparison and co-chromatography with authentic sample), (b) a light yellow compound, m.p. 210–212°. *Benzene fraction.* Concentrated *in vacuo* to almost dryness, extracted with 5% aq. K_2CO_3, acidified with 1:1 ice-cold HCl and the precipitated substance recrystallized from Me_2CO to yield light yellow compound, $C_{17}H_{14}O_6$, m.p. 210–12° (same as the one obtained from ether). It was purple under UV with and without NH_3, gave yellow colour with NH_3 and light green colour with Fe.[3+] It had λ_{max} (nm) 216sh, 275, 331 (MeOH); 276, 353 (NaOAc); 217sh, 297, 354 ($AlCl_3$) and 275, 335 (H_3BO_3 + NaOAC). It had R_f (ascending, 28 ± 1): 0·04 (H_2O), 0·07 (15% HOAc), 0·22 (30% HOAc), 0·60 (50% HOAc), 0·96 (BAW), 0·89 (Forestal), 0·96 (phenol) and 0·98 (*t*BAW). It gave a crystalline acetyl derivative, m.p. 146–148°, and on demethylation (HI + Ac_2O) scuttellarein. From these data, the compound was identified as pectolinaringenin (6,4′-dimethyl scutellarein).

EtOAc *fraction.* A flavanone derivative: NH_3—light yellow, UV—light blue changing to greenish yellow with NH_3; sodium borohydride and HCl—pink, no change on hydrolysis with 25% HCl at 100° for 3 hr. R_f: 0·65, 0·74, 0·82, 0·84, 0·66, 0·86, 0·68 and 0·72 respectively in the above mentioned solvents. It had λ_{max} 291, 320 (MeOH); 291, 321 (NaOAc); 316, 350 ($AlCl_3$) and 291 (H_3BO_3 + NaOAc). It could not be characterized further owing to lack of material.

[1] D. S. BHAKUNI, S. N. SRIVASTAVA, S. I. SEHGAL and K. N. KAUL, *J. Sci. Industries Res.* **21B**, 48 (1962).
[2] S. K. BANERJEE, R. N. CHAKRAVARTI, K. S. SACHDEV and S. A. VASAVADA, *Phytochem.* **8**, 515 (1969).
[3] I. M. BOLGER, *Biochem. J.* **118**, 197 (1970).
[4] M. OKIGAWA, H. HATANAKA, N. KAVANO, I. MATSUNAGA and Z. TAMURA, *Chem. Pharm. Bull.* **19**, 148 (1971).
[5] M. A. ABDULALIM, *Planta Med.* **19**, 319 (1971).
[6] S. S. SUBRAMANIAN and A. G. R. NAIR, *J. Indian Chem. Soc.* **49**, (1972) in press.

Plant. Duranta repens L. (Voucher specimen No. 3/72 deposited at JIPMER) (Syn. *D. plumieri* Jacq.) collected from Botanic Gardens, Pondicherry. *Previous work.* Malvidin[7] of the leaves.

Extraction and working up of the leaves in the same manner as above gave pectolinaringenin and the flavanone derivative with very small quantities of scutellarein.

Comment. It is quite likely that the non-glucosidal bitter principle, $C_{17}H_{16}O_6$, m.p. 213° isolated from *C. phlomides*[1] is pectolinaringenin. The earlier isolation of scutellarein, dinatin and scutellarein-4′-L-arabinoside from *C. nerrifolium*[6] and the present occurrence of scutellarein and pectolinaringenin in *C. phlomides* and *D. plumieri* are in agreement with the flavonoid pattern of Tubiflorae; *Verbenaceae* joining the *Labiatae*, *Bignoniaceae*, *Gesneriaceae* and *Scrophulariaceae* in having flavones with an extra 6-hydroxyl group and 4′-methylated flavones.[8]

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[7] W. G. C. FORSYTH and N. W. SIMMONDS, *Proc. R. Soc.* **142,** 549 (1954).
[8] J. B. HARBORNE, *Comparative Biochemistry of Flavonoids*, p. 216, Academic Press, London (1967).

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IRIDOIDS FROM *STILBE* SPECIES*

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Key Word Index—*Stilbe phylicoides; Stilbe ericoides;* Verbenaceae; iridoids; unedoside.

Plant. Stilbe phylicoides D.C. *Source.* South Africa, Cape, District Swellendam.

Leaf and stem. From 200 g plant material, 100 mg unedoside[1] (0·05%) was isolated by methods described previously.[2] The compound was identified by direct comparison with an authentic sample isolated from *Arbutus unedo* (TLC,[3] PC,[3] MS, NMR, IR).

Plant. Stilbe ericoides L. *Source.* South Africa, near Cape Town.

* Part III in the series "Iridoids and Ecdysones from Verbenaceae". For Part II see Ref. 3.

[1] T. A. GEISSMAN, W. F. KNAACK, JR. and J. O. KNIGHT, *Tetrahedron Letters* 1245 (1966).
[2] H. RIMPLER, *Arch. Pharmaz.* in press.
[3] H. RIMPLER, *Phytochem.* **11,** 2653 (1972).