Phytochemistry 1971, Vol. 10, pp. 1939 to 1940. Pergamon Press. Printed in England.

ANGIOSPERMAE DICOTYLEDONAE

ANACARDIACEAE

POLYPHENOLS OF *LANNEA COROMANDELICA*

S. SANKARA SUBRAMANIAN and A. G. R. NAIR

Department of Chemistry, Jawaharlal Institute of Postgraduate Medical Education
and Research, Pondicherry-6, India

(*Received* 1 *January* 1971)

Abstract—Quercetin-3-arabinoside and ellagic acid have been isolated from the flowers and leaves of *Lannea coromandelica*, while its stem bark has been found to contain β-sitosterol, physcion and physcion anthranol B. The heartwood is rich in leucocyanidin.

Plant. Lannea coromandelica L. *Anacardiaceae.*

Uses. Medicinal.[1,2]

Previous work. Ellagic acid and isoquercitrin from flowers;[3] tannins[1] and β-sitosterol[4] from bark; a neutral polysaccharide from gum.[5]

Present work. Re-examination of fresh flowers (80% alcoholic extract fractionated into petrol, ether and ethyl acetate solubles). Ether fraction: quercetin and ellagic acid (m.p., colour reactions, co-chromatography and acetate). Ethyl acetate fraction: Repeated crystallization from MeOH yielded the less soluble ellagic acid and the more soluble quercetin-3-arabinoside, m.p. 210–212° (decomp.); λ_{max} (EtOH) 259, 361 nm; λ_{min} 238, 286 nm; IR bands at 800, 825, 920, 945, 1000, 1040, 1110, 1195, 1360, 1500, 1600 and 1650 cm^{-1}; acid hydrolysis–quercetin and L-arabinose; complete methylation and hydrolysis–3-hydroxy-5,7,3′,4′-tetramethoxyflavone. On PC (Whatman No. 1, ascending, 30°), the glycoside showed single spot with R_f 0·20 (H_2O), 0·41 (15% HOAc), 0·80 (60% HOAc), 0·80 (BAW), 0·48 (Forestal) and 0·39 (H_2O satd. phenol). Identity further confirmed by superimposable IR spectrum with avicularin (quercetin-3-α-L-arabinoside).[6] Mother liquor contained isoquercitrin (R_f and co-chromatography).

Leaves. β-Sitosterol, ellagic acid, quercetin, quercetin-3-arabinoside, leucocyanidin and leucodelphinidin (direct comparison with authentic samples).

Stem bark. β-Sitosterol (petrol extr.) and physcion anthranol B[7] (hot $CHCl_3$ extract of bark after petrol), m.p. 180–182°, acetate, m.p. 120–122°, colour reactions and CrO_3 oxid-a tion to physcion. Identity confirmed by direct comparison, mixed m.p. and co-TLC (R_f 0·17, silica gel, EtOAc–MeOH–H_2O = 100:16·5:13·5, v/v) with physcion anthranol B obtained by the method of Ashley *et al.*[7] from authentic physcion.[8] Mother liquor contained physcion (R_f 0·84).

---

[1] ANON, *Wealth of India, Raw Materials*, Vol. VI, p. 27, C.S.I.R., New Delhi (1962).

[2] K. R. KIRTIKAR and B. D. BASU, *Indian Medicinal Plants* (edited by L. M. BASU), Vol. I, p. 664, Allahabad (1935).

[3] A. G. R. NAIR, S. S. SUBRAMANIAN and K. SRIDHARAN, *Current Sci.* **32**, 115 (1963).

[4] T. R. GOVINDACHARI, *Indian J. Chem.* **7**, 308 (1969).

[5] R. RAMACHANDRAN and B. C. JOSHI, *Phytochem.* **7**, 2057 (1968).

[6] L. HÖRHAMMER, R. HANSEL, G. KRIESMAIR and W. ENDRES, *Arch. Pharm.* **268**, 419 (1955).

[7] J. N. ASHLEY, H. RAISTRICK and T. RICHARDS, *Biochem. J.* **33**, 1291 (1939).

[8] T. R. SESHADRI and S. S. SUBRAMANIAN, *Proc. Indian Acad. Sci.* **30A**, 67 (1949).

Heartwood. An unidentified sterol, m.p. 73–74° and β-sitosterol (ether extract-chromatography on Al_2O_3). Leucocyanidin (acetone extract), microcrystalline powder (EtOAc–petrol), m.p. > 330° (darkens at 190°), $[\alpha]_D^{30}$ −8·6, λ_{max} 280 nm, colour reactions, preparation of enol acetate (Ac_2O + Py), m.p. 200°, $[\alpha]_D^{30}$ −14° and methyl ether ($Me_2SO_4 + K_2CO_3$, 36 hr), m.p. 260–263° and acid conversion to cyanidin chloride.

Acknowledgements—We are grateful to Prof. Dr L. Horhammer, Munich for the spectral data and direct comparison of our quercetin-3-arabinoside with authentic avicularin, and the Principal, J.I.P.M.E.R. for encouragement.

Phytochemistry, 1971, Vol. 10, p. 1940. Pergamon Press. Printed in England.

ASCLEPIADACEAE

ISOLATION OF FRIEDELIN FROM *SECAMONE AFZELII*

F. EL-SAID, E. A. SOFOWORA and M. A. SALAMI
Drug Research Unit, Faculty of Pharmacy, University of Ife, Nigeria

and

M. SAINSBURY
School of Chemistry and Chemical Engineering, Bath University of Technology,
Bath, Somerset

(*Received* 22 *December* 1970)

FOLLOWING a procedure which we normally use for the isolation of the alkaloidal fraction of plant organs, friedelin was obtained from the root of *Secamone afzelii* Schultes (= *S. myrtifolia* Benth.) This is the first mention of the occurrence of friedelin in *S. afzelii* although, in a recent review, Sainsbury[1] mentioned the fact that this compound and epifriedelinol frequently co-occur and are abundant in Nature. *Sarcostemma viminale* R.Br. is the only other member of the Asclepiadaceae reported to contain friedelin.

1 kg of the powered root was moistened with conc. ammonia solution and allowed to stand for 3 hr before it was exhausted with $CHCl_3$ in a soxhlet. The $CHCl_3$ extract was evaporated to dryness *in vacuo,* then the granular residue was triturated with warm N HCl (10 × 100 ml), and filtered before the acidic extract was shaken with $CHCl_3$ (5 × 100 ml). The $CHCl_3$ fraction was dried ($MgSO_4$) and evaporated to dryness to afford 760 mg of a brown residue (I). Preparative TLC of I (Silica gel; $CHCl_3$–alcohol (abs.)–acetone 90:5:5) gave, among others, a band (R_f 0·70) with bright blue fluorescence in UV and this was eluted with MeOH. Removal of the MeOH, *in vacuo,* gave a pale brownish residue 60 mg of which was taken up in benzene (20 ml), washed twice with dil. HCl (5 ml), dried (Mg SO_4) and chromatographed on neutral grade Al_2O_3. The benzene fraction yielded friedelin (8 mg) which on TLC (Al_2O_3; 5% HOAc in C_6H_6) gave R_f 0·37 and red colour with 5% H_2SO_4 in EtOH after heating at 100° for 5 min. Recrystallization from benzene gave m.p. 261–262°; $[\alpha]_D{}^{21}$ − 20° (benzene); Mass M = 426·3869. $C_{30}H_{50}O$ requires M = 426·3861. IR(CCl_4) λ_{max} 1709 cm^{-1}. This material was identical in all respects to authentic friedelin.

---

[1] M. SAINSBURY, *Phytochem* **9**, 2209 (1970).