Stem. Benzene soluble fraction of EtOH extractive (chromatographed over alumina) gave a wax m.p. 55°. Alkaline hydrolysis afforded *Hexacosanol. n*-BuOH soluble fraction of EtOH extractive (chromatographed over silica gel). *Hydroquinone* $C_6H_6O_2$ m.p. 168°, M^+110, acetate m.p. 121°. *β-Sitosterol-β-D-glucoside* $C_{35}H_{60}O_6$ m.p. 290°, $[\alpha]_D$ −45° (pyridine) (IR and mixed m.p.). Acid hydrolysis furnished β-Sitosterol and glucose. *Luteolin glycoside.* Hydrolysis with 5% H_2SO_4 gave luteolin $C_{15}H_{10}O_6$ m.p. 325°, λ_{max} 256, 267, 349 nm, and glucose and rhamnose.

Phytochemistry, 1971, Vol. 10, pp. 2831 to 2832. Pergamon Press. Printed in England.

FAGACEAE

CHEMICAL CONSTITUENTS OF *QUERCUS LANCEAEFOLIA**

D. K. KULSHRESHTHA and R. P. RASTOGI

Central Drug Research Institute, Lucknow, India

(*Received* 9 *December* 1970)

Abstract—The isolation and identification of friedelin, lignoceryl alcohol, ferulic acid, lignoceryl ferulate, canophyllal, canophyllol and an unusual 2α, 3β dihydroxy triterpene, maslinic acid, have been described.

Plant. Quercus lanceaefolia Roxb.

Occurrence. Eastern Himalayas at an altitude of 2000 ft.

Source. Darjeeling, India.

Biological activity. The benzene-soluble portion of the alcoholic extract of its stem bark possessed hypoglycemic activity.[1]

Stem bark. The concentrated aqueous alcoholic extract of the bark was fractionated by shaking with C_6H_6, $CHCl_3$ and *n*-butanol. The *n*-butanol fraction contained 80% tannins as indicated by Pb $(OAc)_2$ precipitation.

The C_6H_6 and $CHCl_3$ fractions showed nine identical spots on TLC. Both fractions were, therefore, combined and subjected to separation on a silica gel column. The C_6H_6 eluates, containing six substances, on rechromatography on neutral alumina yielded friedelin, canophyllal, canophyllol and lignoceryl ferulate. The C_6H_6 : MeOH (1%) eluate yielded lignoceryl alcohol on further chromatography on silica gel.

The C_6H_6—MeOH (10%) eluate was separated into acidic and neutral components by extraction with 10% aq. Na_2CO_3 solution. Chromatography of the acidic fraction on silica gel gave ferulic acid and maslinic acid.

* Communication No. 1570 from Central Drug Research Institute, Lucknow, India.

[1] M. L. DHAR, M. M. DHAR, B. N. DHAWAN, B. N. MEHROTRA and C. RAY, *Ind. J. Exptl Biol.* **6**, 232 (1968).

EXPERIMENTAL

All the melting points are uncorrected.

Friedelin. $C_{30}H_{50}O$. Found: m.p. 255°, C, 84·1; H, 11·66%; M^+ 426; 2,4-dinitrophenyl hydrazone $C_{36}H_{54}O_4N_4$, m.p. 297°; N, 9·40; IR and NMR were identical with those of the authentic samples; co-chromatography. Required: m.p. 255–261°; C, 84·5; H, 11·73%; M^+ 426; 2,4-dinitrophenyl hydrazone, m.p. 297–299°; N, 9·24%.[2]

Lignoceryl alcohol. $C_{24}H_{50}O$. Found: m.p. 75°; C, 80·96; H, 14·26%; acetate, m.p. 55°; M^+ 396; oxidation with CrO_3–AcOH gave lignoceric acid, m.p. 78°. Required: m.p. 77·5°; C, 81·35; H, 14·12% acetate, m.p. 57°; M^+ 396; lignoceric acid m.p. 83·5°.

Ferulic acid. $C_{10}H_{10}O_4$. Found: m.p. 171°, λ_{max} 222, 240, 300, 327 nm; C, 61·52; H, 5·38; acetate, m.p. 189°; IR, NMR, UV identical with those of synthetic sample; co-chromatography; mixed m.p. undepressed. Required: m.p. 173°; C, 61·85; H, 5·15; acetate m.p. 196°.

Lignoceryl ferulate. $C_{34}H_{58}O_4$. Found: m.p. 77°; ν_{max} 1725 cm^{-1}; λ_{max} 222, 240, 300, 327 nm; C, 77·26; H, 10·65. Required: C, 76·98; H, 10·94; Saponification with alkali gave an acid m.p. 171·5, λ_{max} 222, 240, 300, 327 nm and an alcohol m.p. 74°, which were identified as ferulic acid and lignoceryl alcohol respectively by comparison of their physical data with those of the authentic samples.

Canophyllal. $C_{30}H_{48}O_2$. Found: m.p. 266°; ν_{max} 2680 (C—H stretching of CHO), 1725, 1715 (C=O), cm^{-1}; NMR (ppm), 9·63 (S,CHO), 1·08, 0·98, 0·95, 0·858, 0·72, 0·686, (S, 6 × CH_3), 0·88 (d, J = 6 c/s CH_3); C, 81·48; H, 11·18%. Required: m.p. 263–265°; C, 81·81; H, 10·91%.[3]

Canophyllol. $C_{30}H_{50}O_2$. Found: m.p. 280°, ν_{max} 1700 cm^{-1}; NMR (ppm) 3·68 (S, CH_2O—), 1·15, 0·93, 0·88, 0·73 (S, 4 × CH_3) 1·0 (S, 2 × CH_3), 0·88 (d, J = 6 c/s, CH_3); C, 80·98, H, 11·24%; IR identical with that of authentic sample; co-chromatography. Required: m.p. 280–282°; C, 81·31; H, 11·38%.[3]

Maslinic acid. $C_{30}H_{48}O_4$. Found: m.p. 272°; ν_{max} 1700 cm^{-1}; C, 75·84; H, 10·44%; acetate, m.p. 237–240°; methyl ester, m.p. 230°, ν_{max} 1725 cm^{-1}; NMR (ppm) 0·716, 0·83, 0·966, 1·2, 1·3 (S, 5 × CH_3), 0·916 (S, 2 × CH_3), 2·98 (d, J = 11 c/s, —CH—O—), 3·63 (S, OCH_3), 3·63 (m, —CH—O—), 5·3 (m, olefinic H), methyl ester acetate, NMR (ppm), 0·7, 1·03, 1·10, 1·23 (S, 4 × CH_3), 0·883, (S, 3 × CH_3), 1·95, 2·016 (2 × 0—$COCH_3$), 3·6 (S, OCH_3), 4·71 (d, J = 11 c/s, CH–OAc), 5·1 (t of d's J = 11, 11, 5 c/s, CHOAc), 5·25 (m, olefinic H). The splitting pattern of the two methine protons (CHOAc) was, therefore, consistent with the disposition of the two hydroxyls as 2α, 3β. Required: m.p. 267–269°, C, 76·27, H, 10·169%; methyl ester, m.p. 227–228°, acetate m.p. 235–239°.[4]

Acknowledgements—The authors are grateful to Mr. J. Saran and his associates for microanalyses and to Prof. T. R. Govindachari for supplying a sample of canophyllol.

[2] J. SIMONSEN and W. C. J. ROSS, *The Terpenes*, Vol. IV, p. 468, The University Press, Cambridge (1957).
[3] T. R. GOVINDACHARI, N. VISHWANATHAN, B. R. PAI, U. A. RAO and M. SRINIVASAN, *Tetrahedron* **23**, 1901 (1967).
[4] L. CAGLIOTI, G. CAINELLI and F. MINUTILLI, *Gazz. Chim. Ital.* **91**, 1387 (1961).

Phytochemistry, 1971, Vol. 10, pp. 2832 to 2833. Pergamon Press. Printed in England.

HUMIRIACEAE

AN ISOCOUMARIN FROM THE BARK OF *SACOGLOTTIS GABONENSIS**

A. U. OGAN

Department of Biochemistry, Division of Biological Sciences,
University of Nigeria, Nsukka, Nigeria

(*Received* 15 *March* 1971)

Sacoglottis gabonensis bark is widely used in West Africa as an additive to palm-wine, the major alcoholic beverage drunk by people in the tropical forest regions of West Africa.[1]

* Part VI of the series "Studies on West African Medicinal Plants". For Part V see A. U. OGAN, *Phytochem.* **10**, 2823 (1971).

[1] J. M. DALZIEL, *The Useful Plants of West Tropical Africa*, p. 134, Crown Agents, London (1937).