New compound. Another L–B positive and Tortelli–Jaffe negative compound from the hexane soluble neutral fraction (*vide supra*), m.p. 164–165° (Found: C, 84·97; H, 11·43. $C_{29}H_{46}O$ required: C, 84·88; H, 11·22%), mol. wt. 410 (mass), its IR spectrum showed absence of hydroxyl band and the lone oxygen function in the molecule was a >CO group having absorption at 1720 cm^{-1} (6 membered ketone[10]) besides the other important peaks[11] of a steroid.

The mass spectrum of the compound is in excellent agreement with the cracking pattern reported[12,13] for stigmastane skeleton. The molecular ion peak appearing at *m/e* 410(M^+) undergoes loss of 139 mass units to give the peak at *m/e* 271(M^+—C_{10} side chain). The other peaks are at *m/e* 298(M^+—ring A and CH_3), 229(M^+—side chain and 42 mass units for ring D fragment) and 367(M^+—isopropyl fragment, mass 43), a prominent peak characteristic of the Δ^7-sterols with Δ^{22}-side chain. The absence of the peak at *m/e* 253(M^+—C_{10} side chain and C-3 OH) confirmed that the C-3 constituted the carbonyl group which would not undergo fragmentation;[12] the peak at *m/e* 269 was, however, the base peak.

The NMR spectrum of the ketone showed a broad signal at δ 2·3 ppm(4H) which may be attributed to the proton alpha to the carbonyl group in ring A and the methyl signals between δ 0·6 and 1·1 ppm along with the olefinic protons(3H) as a multiplet centred at δ 5·2 ppm.

The ketone was finally identified as *α-spinasterone* (5α-stigmasta-7,22-dien-3 one) by mixed m.p. and superposable IR spectrum with the derived[14] α-spinasterone from α-spinasterol.

The L-B positive and TLC pure natural and the derived samples of α-spinasterone do not respond to Tortelli-Jaffe colour test which otherwise should have been positive as it is specific for α-spinasterol. Clark-Lewis *et al.*[13] observed that pure α-spinasterol is negative to this test; it is positive only when it is contaminated with stigmast-$\Delta^{8(14)}$-enol. This contention has since been substantiated by our observations too and the ketone further proved to be a single entity.

The mother liquor of α-spinasterone on co-TLC (silica gel G, benzene) showed the presence of *lupenone* besides other compounds (*vide supra*).

The presence of α-spinasterone, α-spinasterol and its glucoside in the same plant part is of biogenetic interest.

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[10] P. SENGUPTA and H. N. KHASTGIR, *Tetrahedron* **19**, 123 (1963).
[11] R. N. JONES and A. R. H. COLE, *J. Am. Chem. Soc.* **74**, 5648 (1952).
[12] S. S. FRIEDLAND, G. H. LANE, JR., R. T. LONGMAN, K. E. TRAIN and M. J. O'NEAL, JR., *Anal. Chem.* **31**, 169 (1959).
[13] J. W. CLARK-LEWIS and I. DAINIS, *Aust. J. Chem.* **20**, 1961 (1967).
[14] K. BOWDEN, I. M. HEILBRON, E. R. H. JONES and B. C. L. WEEDON, *J. Chem. Soc.* 39 (1946).

Phytochemistry, 1971, Vol. 10, pp. 1955 to 1956. Pergamon Press. Printed in England.

MELIACEAE

TETRANORTRITERPENOIDS FROM *CEDRELA FISSILIS*

R. ZELNIK and C. ROSITO

Serviço de Química Orgânica, Instituto Butantan, São Paulo, Brasil

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Abstract—The co-occurrence of mexicanolide and 3-β-hydroxy-isomexicanolide in the seeds of *Cedrela fissilis* Velloso is recorded.

Plant. Cedrela fissilis Velloso.

Occurrence. São Paulo (Campinas), Minas Gerais.

Source. Horto Florestal, Cantareira, São Paulo.

Previous work. On sister species.[1-4]

Seeds (1·6 kg). The petrol extracts gave 327 g (20·4%) of oil. The defatted material was extracted with $CHCl_3$ and the viscous residue (150 g) treated with petrol. The resulting yellowish crystalline-like precipitate (110 g), m.p. 60–80°, was chromatographed on silica gel columns. The benzene–$CHCl_3$ (9:1) eluates furnished 11·58 g (0·72%) of mexicanolide, m.p. 225–228° (MeOH), mixed m.p., co-chromatography and IR spectra with an authentic sample. The benzene–$CHCl_3$ (1:1) eluates afforded 22·89 g (1·43%) of 3-β-hydroxy-iso-mexicanolide[4] which was separated from contaminants by crystallization in pyridine, m.p. 112–118°, raised to 189–194° after recrystallization in Et_2O, mixed m.p., co-chromatography and IR spectra with an authentic sample.

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[1] J. R. HOUSLEY, F. E. KING, T. J. KING and P. R. TAYLOR, *J. Chem. Soc.* 5095 (1962).
[2] C. W. L. BEVAN, J. W. POWELL and D. A. H. TAYLOR, *J. Chem. Soc.* 980 (1963).
[3] E. B. RITCHIE and J. W. STEELE, *Planta Med.* **14**, 247 (1966).
[4] D. LAVIE, E. C. LEVY, C. ROSITO and R. ZELNIK, *Tetrahedron* **26**, 219 (1970).

Phytochemistry, 1971, Vol. 10, pp. 1956 to 1961. Pergamon Press. Printed in England.

ONAGRACEAE

TRITERPENES IN THE SEED OIL OF EVENING PRIMROSE, *OENOTHERA LAMARCKIANA*

B. J. HOPKINS and F. SCHEINMANN

Department of Chemistry, University of Salford, Salford M5 4WT, Lancashire

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Abstract—β-Sitosterol and lupeol have been isolated from the seed oil of *Oenothera lamarckiana* Ser. Two other triterpenes present in trace amounts are citrostadienol and cycloartenyl palmitate.

THE SEED oil of evening primrose (*Oenothera lamarckiana* Ser. Onagraceae) is rich in the glycerides of saturated and unsaturated fatty acids[1] and is of promise in the treatment of

[1] J. P. RILEY, *J. Chem. Soc.* 2728 (1949).