Phytochemistry, 1971, Vol. 10, p. 1687. Pergamon Press. Printed in England.

ANGIOSPERMAE

ANACARDLACEAE

LIGNOCERIC ACID AND OTHER COMPOUNDS OF *SCHINUS MOLLE**

XORGE A. DOMINGUEZ, JAVIER F. CARMONA and ROSARIO B. DE VENEGAS
Departamento de Quimica, Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, N.L., México

(Received 2 November 1970)

*Plant. Schinus **molle*** L. 'pirul'.

Uses. The fruits, gum exudates and the leaves are used with medical purposes.'

Previous work. On the essential oil [2–4] and tannins[4] and sister **specie.**[5]

Plant material. Twigs and leaves collected in Monterrey, N.L. were extracted successively with petrol, Et_2O and EtOH; chromatographed on silica gel.

*Light **petroleum.*** Lignoceric acid, $C_{24}H_{48}O_2$, m.p. 81–82°, IR, NMR, mixed m.p. CO TLC. New compound: $C_{29}H_{46}O_2$. (Found: C, 81·75; H, 11·07; 0, 7·28; Calc. C, 81.63; H, 10·87 0, 7·50%.) Mol. wt. M+ 426; m.p. 190–192°, $[\alpha]_D$ IR $+29{\cdot}6°$ (CHl). Important IR peaks: 3660, 3580 (m), 2900 (s), 2840 (m), 1620 (w), 1450 (m), 1435 (n), 1360, 1080, 870 cm^{-1} LB color red, green, blue, to black, TNM test positive. UV λ_{max}^{Etoh} 212 nm (c-1430). Acetate: m.p. 214–215°, $[\alpha]_D + 44{\cdot}0$ (CHl). Important IR peaks; 3420 (m), 2900-2830 (s), 1740 (s), 1620 (w), 1455 (m), 1435 (m), 1370(m), 1360(m), 1225(s), 1045(m), 880 cm^{-1}. β-Sitosterol: eluted by benzene–$CHCl_3$; $C_{29}H_{50}O$ (m.p., mixed m.p., 137–139°, $[\alpha]_D$ -38" (CHl), coTLC and superimposable IR spectra of alcohol and acetate. EtOH–quercetrin (m.p., mixed m.p. ; IR, UV, coTLC). Reactions for alkaloids were negative.

Acknowledgements-The FORGE for a research grant and to Prof. Dr. P. Crabbe from SYNTEX for the mass spectrum.

* Part XV in the series "Studies on Mexican Medicinal Plants".

[1] M. Martinez, *Las Plantas Medicinales de México* (4th Edition) p. 261, Editorial Botas, Mexico (1959).

[2] A. Cremoni, *Ann. Chim. Appl.* **18**, 361 (1928).

[3] G. Ottolino, *Attie. Relaz. Pugl. Sci.* **6**, 49 *(1948);* C.A. **44**, 9807 d (1951).

[4] M. Gonzalez, *Anales Fac. Quim. Farm.* 1, 133 (1931).

[5] K. K. Kaistha and L. B. Kier, *J. Pharm. Soc.* **51**, 1136 (1962).

Phytochemistry, 1971, Vol. 10, pp. 1687 to 1688. Pergamon Press. Printed in England.

APOCYNACEAE

TRITERPENES FROM *MELODZNUS AUSTRALZS*

L. A. MITSCHER and E. N. VORPERIAN†
Division of Natural Products Chemistry, College of Pharmacy, The Ohio State University, Columbus, Ohio 43210, U.S.A.

(Received 21 July 1970)

A NUMBER of interesting indole alkaloids have been isolated from the root bark of the Southeast Asian woody shrub, *Melodinus australis* Maider and Betche.[1] In our hands a

† Present address: Faculty of Pharmacy, The American University, Beirut, Lebanon.

[1] H. H. A. Linde, *Helv. Chim. Acta* **48**, 1822 *(1965).*

specimen of the aerial parts yielded very little alkaloid (4·5 g of a crude mixture from 16·3 kg). Accordingly, we turned our attention to the more plentiful terpene fraction (143·6 g, 0·8%). Although a related species, ***M. monogynous,*** is reported[2] to contain the triterpenes lupeol and 3,20-lupanediol, no studies of a similar type have been carried out on M. *australis*. Accordingly, the ground leaves and stems were extracted with EtOH by percolation and the extractives were separated into broad chemical classes in the usual fashion (Experimental). The terpene-sterol fraction was chromatographed on silicic acid columns with fractions monitored by TLC and weight. Only two substances of consequence were present and these were identified as betulin and oleanolic acid after spectroscopic examination, preparation of suitable derivatives, and comparison with authentic specimens. Betulin and oleanolic acids are relatively common triterpenes but this is the first report of their occurrence in *Melodinus* sp. and is presented for its chemotaxonomic interest.[3]

EXPERIMENTAL

The plant parts consisted of the dry, powdered leaves and stems of ***Melodinus australis,*** Maider and Betche, and were purchased in 1965 from the Meer Corporation, New York, N.Y., as lot number 6-23835.

Isolation

The ground plant (16.3 kg) was percolated at room temp. with EtOH, 250 1. sufficing to exhaust the plant. The solvent was removed under reduced pressure at a temperature not in excess of 40" to give 1.15 kg (7 %) of a dark, gummy residue. This residue was partitioned between 2% citric acid and $CHCl_3$. A considerable portion (300 g) was insoluble in either phase. The alkaloids were recovered from the citric acid solution by alkalinization and extraction with $CHCl_3$, etc., to yield 4·5 g (0.03 %) of a complex dark mixture. The $CHCl_3$ layer was evaporated and this residue (309 g) was further subfractionated by partition between hexane and MeOH containing 10% H_2O. Evaporation of the MeOH layer produced 135 g (0·8%) of crude terpene-sterols. A portion of this (24 g) was chromatographed in the usual way over 400 g of SiO_2 (Mallinckrodt, 100 mesh). Compound A (subsequently identified as betulin) was present in fractions 22-35 (150 ml each fraction). These weighed 8.67 g and crystallized from $CHCl_3$–CH_3OH, m.p. 244-247". Ultimate purity was achieved by treating 328 mg of these crystals with C and rechromatographing on silica gel G using 8 % CH_3OH in $CHCl_3$ as eluant. In this way 305 mg of pure crystals, m.p. 254–255°, $[\alpha]_D$ + 14" ($CHCl_3$), $[\alpha]_D$ +18° (pyridine); diacetate, m.p. 220–222°, $[\alpha]_D$+18° ($CHCl_3$); dibenzoate, m.p. 178–180°, $[\alpha]_D$+40 ($CHCl_3$); dihydro derivative m.p. 274–6°, $[\alpha]_D$+18° (pyridM*—442.

%ırCH_3OHioniofnt$CHCl_3$inal column with 2
MeOH, which crystallized with great difficulty from
SiO_2-Gmaterial was chromatographed over % CH_3OH $CHCl_3$.
m.p. 298–303°; 262–264°,
$[\alpha]_D$+65° ($CHCl_3$); 219–224°, $[\alpha]_D$ +68° ($CHCl_3$);

---

[2] S. K. CHATTERJI, N. ANAND and M. L. DHAR, *J. Sci. Znd. Res. India* **18B**, 262 (1959); *J. Sci. Ind. Res Zndia* **13B**, *546 (1954).*

[3] R. HEGENAUER, ***Chemotaxonomie der Pflantzen,*** Vol. III, p. 145, Birkhauser Verlag, Basel (1964).