from clove oil,[3] its presence was verified by isolating 0·1% of naphthalene from each of 3 different samples. The content of the steam distillation flask was filtered (the filtrate gave glucose and xylose with smaller amounts of arabinose) and the residue treated with 10% alcoholic NaOH and re-filtered. The filtrate was acidified and the residue obtained was worked up to give oleanolic acid[5,6] (*ca* 1%), sitosterol (*ca* 0·1%) and maslinic acid (2α-hydroxyoleanolic acid) (*ca* 0·15%): m.p. 262°, $[\alpha]_D$ + 50°, methyl ester, m.p. 227° $[\alpha]_D$ + 60°, methyl ester diacetate m.p. 170°, $[\alpha]_D$ + 34°. The constants are in agreement with literature values.[7–9] The NMR spectra of the last two derivatives show that the two hydroxyl substituents at C_2 and C_3 are equatorial in a chair ring: methyl ester 3α-H (δ 3·0, *d*, *J* 10 Hz), $C_2\beta$-H (δ 2·63, b.m.), methyl ester diacetate, $C_3\alpha$-H (δ 4·72, *d*, *J* 10 Hz) and $C_2\beta$-H (δ 4·45, b.m.).

The residue left after the extraction with alcoholic NaOH was analysed and showed Al, Fe, CO_3'' and oxalate as major and Mg, Si, Cl' and SO_4'' as minor ions.

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TERPENOIDS AND HYDROCARBONS OF *ACROPTILON PICRIS*

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Key Word Index—*Acroptilon picris*; Compositae; triterpenes; behenicacid octacosyl ester; α-euphorpol.

Plant. Acroptilon picris Pall. (Voucher specimen No. APC 97, Department of Pharmacognosy, School of Pharmacy, University of Tehran, Iran). *Source.* Central part of Iran plateau. *Previous work.* None.

Results. Roots, stems, leaves and flowers were air dried, milled, and exhaustively extracted with petrol. (40–60°). The residue was dissolved in petrol. and chromatographed on neutral aluminum oxide (E. Merck). *n*-Nonacosane $C_{29}H_{60}$ m.p. 62–64° (Found, C, 84·88, H, 14·60. Reqd. C, 85·20, H, 14·80%, m.m.p., TlC, IR and NMR) was found in the earlier petrol fraction and crystallized from MeOH–petrol. The petrol.–C_6H_6 fractions (80–20) gave behenic acid octacosyl ester (from MeOH) $C_{50}H_{100}O_2$[1] m.p. 78–80° [(Found, C, 82·06, H, 13·60. Reqd. C, 81·96, H, 13·66%. IR 1730 and 1140 cm^{-1}, NMR($CDCl_3$) δ4·05 ppm (*t*, *J*6 Hz, 2H, $-CH_2-O-$), 2·26 ppm (*t*, *J*6 Hz, 2H, $-CH_2-CO-$), 1·25 ppm (*s*, 90 H), 0·90 ppm (*s*, 3H, –Me), and 0·65 ppm (*s*, 3H, –Me)]. Hydrolysis gave, octacosanol (m.p., m.m.p., TlC, IR and NMR), and behenic acid (m.p., m.m.p., TlC, IR and NMR). Octacosanol. $C_{28}H_{58}O$[2] m.p. 81–83° (Found, C, 81·55, H, 14·12. Reqd. C, 81·67, H, 14·23%. IR, 3418 cm^{-1}, m.m.p., TlC, NMR. Acetate and benzoate m.p., m.m.p., IR 1740 cm^{-1}) was found in the benzene–$CHCl_3$ fractions (95–95) and was crystallized from MeOH–acetone

[1] ANEHCHI, Y. and MAHMOODIAN, M. (1973) *Acta Pharm. Suecuca* **10**, 515.
[2] AYNEHCHI, Y., MOJTABAII, M. and YAZDIZADEH, K. (1972) *J. Pharm. Sci.* **61**, 292.

(80–20). α-Euphorbol. $C_{30}H_{50}O$[3] m.p. 126–127° (Found, C, 84·52, H, 11·42. Reqd. C, 84·44, H, 11·81%. IR 3400 cm^{-1}, NMR, m.m.p., TlC. Acetate and benzoate, m.p. m.m.p., IR 1740 cm^{-1} and NMR) was in the $CHCl_3$–C_6H_6 (15–85) fractions and crystallized from MeOH.

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[3] KOPACZEWSKI, W. and DUPONT, G. (1947) *Bull. Soc. Chim. France* 909.

Phytochemistry, 1974, Vol. 13, p. 2001. Pergamon Press. Printed in England.

TARAXASTEROL FROM *STEVIA BERLANDIERI* AND *CIRSIUM TEXANUM*

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Key Word Index—*Stevia berlandierei*; *Cirsium texanum*; Compositae; triacontane, taraxasteryl acetate, taraxasterol, sitosterol, 5,6-dihydroxy-7,8,4′-trimethoxyflavone, pentacosanone-12, mannitol.

Plant. Stevia berlandieri A. Gray. *Source.* Galeana, Coah. August 1973 (Voucher specimen No. 7298). *Previous work.* On sister species.[1]

Present work. The dried whole plant was extracted successively with petrol. and EtOH. Each extract was chromatographed over silica-gel. The compounds were identified by IR, NMR, UV, [α], MS, m.m.p. and coTLC. The petrol. extract afforded, triacontane, taraxasterol and sitosterol. From the EtOH extract 5,6-dihydroxy-7,8,4′-trimethoxyflavone was isolated.

Comments. Tests[2] and IR examination for sesquiterpene lactones and alkaloids were negative.

Plant. Cirsium texanum, Buckl. *Source.* Monterrey, N.L. July 1973 (Voucher specimen No. 72). *Previous work.* On sister species.[3]

Present work. The dried roots and aereal part was extracted successively with petrol. and EtOH. Chromatography on silica gel of the petrol. extract gave pentacosanone-12, m.p. 65°, IR, NMR, MS; pseudo-taraxasteryl acetate, m.p., [α], IR, NMR, UV, MS and coTLC; pseudo-taraxasterol, m.p. m.m.p. [α], IR, NMR, MS and coTLC. From the EtOH extract D-mannitol was obtained. It was identified on its m.p. [α], IR, NMR, m.m.p. and the same properties of its hexacetate and hexabenzoate.

Comments. Tests and IR examination for sesquiterpene lactones and alkaloids were negative.

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[1] (a) HEGNAUER, R. (1964) *Chemotaxonomie der Pflanzen*, Vol. 2, p. 482, Birkhauser, Basel. (b) RIOS, T. A., ROMO DE VIVAR and ROMO, J. (1967) *Tetrahedron* **23**, 4265.
[2] DOMÍNGUEZ, X. A. (1973) *Métodos de Análisis Fitoquímico*, Limusa Wiley, México.
[3] DUTTA, C. P., LALA, P. K. and ROY, D. N. (1972) *Phytochemistry* **11**, 2267.