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SHORT COMMUNICATION

THE IDENTIFICATION OF LONG-CHAIN ALCOHOLS FROM *EUPHORBIA* SPECIES*

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Abstract—The structure of the long-chain alcohols from four *Euphorbia* species have been investigated by GLC. The alcohol isolated from *E. polygonifolia*, previously reported to be 1-hexacosanol, was shown to be mainly 1-octacosanol, but contrary to the suggestion of other investigators the major component of the alcohol mixture from *E cyparissias* and *E esula* has been confirmed as 1-hexacosanol. The analysis of the alcohols from *E supina* is also reported

A RECENT paper suggesting that 1-octacosanol is the long-chain alcohol commonly isolated from species of *Euphorbia* (Euphorbiaceae)[1] prompts the present report. Although the physical data (IR, m.p., mixed m.p. and m.p. of its acetate) obtained for the alcohol from *E. corollata* L. indicated it to be 1-hexacosanol (ceryl alcohol), Piatak and Reimann[1] reported that GLC analysis showed that it was 1-octacosanol. We have re-examined by GLC the acetate of the ceryl alcohol fraction from three of these species, *E. cyparissias* L.,[2] *E. esula* L.,[3] and *E. polygonifolia* L.,[4] and the results confirm the identification of the alcohol from the first two species but shows that the alcohol from *E. polygonifolia* is 1-octacosanol. In addition, the main component of the long-chain alcohol fraction from *E. supina* Raf. has been shown to be 1-octacosanol. Minor amounts of other substances were detected in these samples including 1-octacosanol in the alcohol from *E. cyparissias* and *E. esula* and 1-hexacosanol in that from *E polygonifolia* and *E. supina*. Results of the

TABLE 1 COMPOSITION (%) OF ACETATES OF LONG-CHAIN ALCOHOLS FROM FOUR *Euphorbia* SPECIES

Compound	Retention time (min)	*E cyparissias*	*E esula*	*E polygonifolia*	*E supina*
Hexacosanyl acetate	4 2	72	85	2	2
Octacosanyl acetate	6 0	15	15	87	58
Unknown 1	8 4	13	—	11	31
Unknown 2	12 0	—	—	—	9

* Contribution No 483

[1] D. M PIATAK and K. A REIMANN, *Phytochem.* **9**, 2585 (1970).
[2] A N STARRATT, *Phytochem* **5**, 1341 (1966)
[3] N R FARNSWORTH, H. WAGNER, L HORHAMMER, H. P HORHAMMER and H H S FONG, *J Pharm Sci* **57**, 933 (1968)
[4] A. N STARRATT, *Phytochem* **8**, 795 (1969)

analysis are presented in Table 1 The other peaks (unknowns 1 and 2) are probably due to C_{30} and C_{32} homologues since a plot of the logarithm of the retention times for the four observed components against the assigned carbon numbers gave a straight line [5]

Our study shows that 1-octacosanol is not the only long-chain alcohol occurring in *Euphorbia* species, and indicates the importance of using GLC or mass spectral analysis to assign structures to such compounds and determine homogeneity The finding that the alcohols which we have analysed contained more than one component is not surprising since a homologous series of long-chain alcohols commonly occurs in plant extracts [6]

EXPERIMENTAL

Isolation The isolation of the long-chain alcohol from *E cyparissias* and *E polygonifolia* has been described [2,4]

Dry, ground *E esula* (aerial parts, 250 g) collected during October 1968 at Picton, Ontario was extracted with light petroleum (30–60°) for 42 hr in a Soxhlet The extracted material (9·7 g) was saponified and the nonsaponifiable fraction (7 2 g) was chromatographed (Woelm neutral alumina, grade III, 200 g) Elution with light petroleum–benzene (1 1) gave a mixture of triterpene and long-chain alcohols Part of the alcohol fraction was acetylated and the product adsorbed on a column (Woelm neutral alumina, grade I) Elution was started after 2 hr to allow for hydrolysis of the ceryl acetate [2] Recrystallization of the alcohol fraction from $CHCl_3$-acetonitrile gave ceryl alcohol, m p 76–78° (uncorr , undepressed with authentic 1-hexacosanol) TLC (Kieselgel, ethyl acetate–benzene (13 7) showed the presence of a small amount of impurity, probably a triterpene, moving slightly faster than the ceryl alcohol spot The impurity became visible before ceryl alcohol upon heating the developed plate after spraying with 50% H_2SO_4

Dry, ground *E supina* (aerial parts, 40 g) collected during September 1965 at Belleville, Ontario, was extracted similarly Chromatography of the extracted material (1·5 g), acetylation and chromatography of the acetate in the manner described above gave only a small alcohol fraction probably indicating that hydrolysis of the long-chain acetate was incomplete Recrystallization of the alcohol from ether–light petroleum, gave crystals, m p 78–80° (uncorr , undepressed with authentic 1-hexacosanol) No impurities were detected by TLC

Analysis The long-chain alcohols acetylated with acetic anhydride-pyridine, were analysed on a 1 5 m × 6 mm column packed with 20% SE-30 on Chromosorb W using an Aerograph Model 90-P3 with a thermal conductivity detector The flow rate was 60 ml/min helium gas and the column temperature 308° Retention times of the acetates of the two plant alcohols were compared with those for the authentic acetates Peak areas were determined by triangulation

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[6] G EGLINTON and R J HAMILTON, *Science* **156,** 1322 (1967)

Key Word Index—Euphorbia, Euphorbiaceae, chemotaxonomy, octacosanol, hexacosanol