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LEGUMINOSAE

CONSTITUENTS OF WAX FROM *DESMODIUM TILIAEFOLIUM* LEAVES

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Key Word Index—*Desmodium tiliaefolium*; Leguminosae; wax acids; wax alcohols.

Plant. *Desmodium tiliaefolium* (Peshawar Herbarium No. 2514 a), collected from Kagan Valley, N.W.F.P. **Uses.** Medicinal.¹ **Previous work.** Alkaloids reported from sister species.²

TABLE 1. DISTRIBUTION OF ALCOHOLS AND ACIDS FROM WAXES ON THE LEAVES OF *Desmodium tiliaefolium*

Carbon chain length	% Composition Wax acids	% Composition Wax alcohols	Carbon chain length	% Composition Wax acids	% Composition Wax alcohols
C ₂₂	0.2	—	C ₂₉	5.4	2.4
C ₂₃	0.2	—	C ₃₀	29.9	49.1
C ₂₄	2.6	—	C ₃₁	1.5	0.8
C ₂₅	—	—	C ₃₂	6.1	3.6
C ₂₆	11.2	9.3	C ₃₃	0.2	—
C ₂₇	3.1	1.4	C ₃₄	0.6	0.6
C ₂₈	37.7	32.8	—	—	—

Present work. The hexane extract of the leaves yielded *n*-aliphatic alcohols, predominantly triacontanol plus a large amount of octacosanol (Table 1). The extract also yielded wax esters, sitosterol and *n*-aliphatic wax acids. Chain length of the wax esters was established

TABLE 2. COMPOSITION OF WAX ESTERS IN THE LEAVES OF *Desmodium tiliaefolium*

Carbon chain length of acid	% Composition	Carbon chain length of alcohol	% Composition
C ₁₄	0.5	C ₂₄	9.8
C ₁₅	0.4	C ₂₅	2.1
C ₁₆	19.6	C ₂₆	46.9
C ₁₇	0.9	C ₂₇	4.2
C ₁₈	21.3	C ₂₈	23.2
C ₁₉	0.6	C ₂₉	1.5
C ₂₀	41.4	C ₃₀	11.1
C ₂₁	—	C ₃₂	0.7
C ₂₂	9.9	C ₃₄	0.2
C ₂₃	2.7	C ₃₆	0.2

No C₃₁, C₃₃ or C₃₅ alcohols were found.

¹ R. N. CHOPRA, S. L. NAYAR and I. C. CHOPRA, *Glossary of Indian Medicinal Plants*, p. 94, CSIR, New Delhi (1956).

² S. GHOSAL and B. MUKHERJI, *Chem. & Ind.* 1800 (1964).

by carrying out TLC and GLC using synthetic triacontyl hexadecanoate as a reference compound. Ethanolysis of the wax esters was also carried out and the mixture of the ethyl esters was analysed by GLC. The major constituent of the wax ester was thus found to be hexacosyl eicosanoate. The acids and alcohols composing the esters are given in Table 2. The free *n*-aliphatic acids were analysed by GLC as methyl esters and the principal component was shown to be octacosanoic acid (Table 1). Sitosterol was identified by m.p., m.m.p., IR and analyses of the sterol and its acetate.

EXPERIMENTAL

Dried shade leaves (7.6 kg) were powdered and extracted with hexane. The extract deposited a granular solid (35.6 g) on concentration which was filtered. The filtrate was completely dried to give a semi-solid waxy mass (184 g).

Wax esters. A portion of the waxy mass (15 g) was chromatographed on alumina (E. Merck). Elution with hexane gave esters, m.p. 71–72°, ν_{max} 1740, 730, 720 cm^{-1} . The composition of the chain lengths was found: C_{42} , 7.1%; C_{44} , 30.2%; C_{46} , 47.2%; C_{48} , 13.5%; C_{50} , 2.0% on GLC analysis (Hewlett-Packard 402 gas chromatograph with flame ionization detector; Column 91.5 × 0.32 cm stainless steel tube packed with 80–100 mesh silanised acid washed chromosorb W coated with 2% Silicone SE30).

Sitosterol. Elution of the column with hexane–benzene (1:1) gave sitosterol identified by m.p., m.m.p., IR, analyses of the sterol, and its acetate.

Wax acids. Further, elution with ethyl acetate yielded a solid (13 mg), m.p. 83–85°, ν_{max} 1705, 730, 720 cm^{-1} .

Wax alcohols. The greenish yellow granular solid was recrystallised alternately from hexane and acetone to yield a colourless residue, m.p. 77–78°, ν_{max} 3400, 2950, 1470, 728, 720 cm^{-1} . Found: C, 82.48; H, 13.70. $C_{30}H_{62}O$ requires: C, 82.11; H, 14.24.

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PAPAVERACEAE

ALKALOIDS OF *ARGEMONE SUBFUSIFORMIS**

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Key Word Index—*Argemone subfusiformis* subsp. *subfusiformis*; Papaveraceae; protopine; allocryptopine; berberine; sanguinarine; chelerythrine.

Plant. *Argemone subfusiformis* Ownb. subsp. *subfusiformis*.¹ *Source.* Collected in Córdoba Province, Argentina (local name 'cardo santo', 'cardo amarillo'). A voucher specimen is deposited in the university herbarium (Museo de Botánica, Universidad

* Part III in the series "Alkaloids of Argentine Medicinal Plants". For Part II see M. N. GRAZIANO, G. E. FERRARO and J. D. COUSSIO, *Lloydia* 34, 453 (1971).

† From which KNO_3 crystallized, 1% of the dried plant weight.

¹ G. B. OWNBEY, *Brittonia* 13, 91 (1961).