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SHORT COMMUNICATION

TARAXASTEROL AND ITS DERIVATIVES FROM *CIRSIUM ARVENSE*

C. P. DUTTA and LALA P. K. RAY

Department of Chemistry, University of Kalyani, Kalyani, West Bengal, India

and

D. N. ROY

Shade Tree Research Laboratory, Faculty of Forestry, University of Toronto, Toronto, Canada

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Key Word Index—*Cirsium arvense*; Compositae; taroxasterol; chemotaxonomy.

Cirsium arvense (Linn) Scop, (Syn. *Cnicus arvensis* Hoffm) from which glucosides and alkaloids have previously been isolated,[1] was extracted with light petroleum (b.p. 60–80°) and fractionated into acidic and neutral fractions. Neutral fractions was chromatographed over Brockmann alumina. Flution with light petroleum (b.p. 60–80°) and benzene (8 : 2) mixture yielded *taraxasterol acetate*, $C_{32}H_{52}O_2$, (M^+, 468), m.p. 242–244°, $[\alpha]_D$ +105·2° (*c*, 1·14 in $CHCl_3$), (lit.,[2] m.p. 245–248°, $[\alpha]_D$ +101, $CHCl_3$), (m.m.p. and IR).

Benzene–$CHCl_3$ (8 : 2) eluates afforded two more crystalline compounds: *taraxasterol*, $C_{30}H_{48}O$, (M^+, 426), m.p. 216–218°, $[\alpha]_D$ +108·7° (*c*, 0·46 in $CHCl_3$), (lit.[2], m.p. 217–227°, $[\alpha]_D$ 95 ± 2°, ($CHCl_3$)); characteristic NMR bands at 1·00δ (doublet, $J = 6$ Hz sec CH_3), 0·9–1·18δ (6 tert. CH_3), 2·10–2·40δ (2H, multiplet, C–H) and 4·65δ (2H, broad, exocylic vinyl probons); (m.m.p. and IR). Stigmasterol, $C_{29}H_{48}O$, m.p. 155–156°[3], $[\alpha]_D$ −50·7° (*c*, 0·67 in $CHCl_3$), stigmasterol acetate, m.p. 140–141°.[3]

TABLE 1

Plant family	Genus and species	Source	Taraxasterol	Taraxasterol acetate	Stigmasterol	Related compounds: Terpenoids	Related compounds: Steroids	Related compounds: Other compound
Apocynaceae	*Holarrhena antidysenterica*[4]		+	–	–	–	–	–
Asclepiadeceae	*Calotropis gigantea*[5]	Root bark	+	–	–	ψ-Taraxasterol α- and β-amirin	Sitosterol	–
	C. Procera[4]	Stem bark	+	–	–	–	–	–
	Hoya australis[4]		+	–	–	–	–	–
Balanophoraceae	*Balanophora japonica*[6]	Bird lime	+	–	–	β-Amyrin	–	–

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TABLE 1—(*continued*)

Plant family	Genus and species	Source	Taraxasterol	Taraxasterol acetate	Stigmasterol	Related compounds: Terpenoids	Related compounds: Steroids	Related compounds: Other compound
Capparidaceae	*Capparis sepiaria*[7]	Leaves	+	–	–	α- and β-amyrin	Sitosterol	–
Compositae	*Eupatorium cannabinum*[8]	Flower	+	–	–	Palmitic acid	–	–
	E. cannabinum var syriacum[8]	Flower	+	–	–	–	–	Caffeic acid, chlorogenic acid fructose and glucose
	E. cannabinum var. *syriacum*[9]	Stem	+	–	–	–	–	Ascorbic acid, rutin, chlorogenic acid, caffeic acid, glucose fructose, fructans, rutinose, rhaminose and deriv. of *p*-coumaric acid
	Taraxacum[10] *Kok-Saghyz*	Root	+	–	–	Homotaraxasterol, taraxerol, β-amyrin and cluytianol		–
	Saussurea[11] *frolowii*		+	–	–	–	–	–
	Launea pinnatifida[12]	Leaves and roots	+	+	–	–	–	–
	Centaurea arbutifolia[13]	Leaves	+	–	–	β-Amryin	Sitosterol	Chrysoeriol, 3-methylkaempferol, 3-methyl quercetin and 7-rutinosyl-3 methyl kaemferol
	Cynara scolymus[14]	Leaf	+	–	+	ψ-Taraxasterol	Sitosterol	Cynarogenin, an ester $C_{44}H_{48}O_2$ and a hydrocarbon $C_{32}H_{66}$-$C_{34}H_{70}$
	Sonchus ortunoi[15]		+	–	–	β-Lactucerol, ψ-taraxasterol	Sitosterol and a group of substace of steroid nature	Hexacosanol
	S. leptocephalus[15]		+	–	–	β-Lactucerol, ψ-taraxasterol	Sitosterol and a group of substace of steroid nature	Hexacosanol
	S. oleraceus L.	Whole plant	+	–	–	–	–	–
	Taraxacum[17]	Root	+	–	–	ψ-Taraxasterol and β-amyrin	–	–
	Anthemis nobilis[17]	Root	+	–	+	–	Sitosterol	–
	Andryala canariensis[18]	Latex	+	–	–	Hetero lupeol	–	–
	Centaurea behen[19]	Root	+	+	–	myristic ester of ψ-taraxasterol acetate	–	–
	Arnica[20]	Flower	Taraxasterol-ψ-taraxasterol	–	–	Arnidiol, faradiol, β-lactucerol and ψ-taraxasterol	Sitosterol	1,11-Tridecane 3,5,7,9 tetryne, 1,tridecene 3,5,7,9,11, pentayne thymol methyl ether and unidentified compounds
	Chrysanthemum cinerariaefolium[21]	Flower	+	–	–	Lupeol, α- and β-amyrol		Pyrethrosin and pyrethrol
	Sonchus spinosus[22]		+	–	–	–	Sitosterol and probably sitostanol	–
	Yougia denti calata[23]		+	–	–	Germanicyl acetate, taraxasteryl acetate and germanicol	Sitosterol	1-Hexacosanol
Euphorbiaceae	*Euphorbia tricualli*[24]	Latex	+	–	–	Euphol, triucallol	–	–
	Euphorbia watanabei[25]		+	–	–	Taraxerol acetate, lupeol acetate and tarazerone	Sitosterol	Tetra cosanol, monacosane and alunusenone
Fagaceae	*Castanopsis fabri*[26]	Leaves	+	–	–	Glutinol, friedelin and friedelan 3β-ol	Sitosterol	Ellagic acid
	Castanopsis[26] *hickelii*	Leaves	+	–	–	Friedelin and and friedelan 3β-ol	Sitosterol	–
Verbenaceae	*Avicennia marina*[27]		+	–	–	–	–	–

It is observed (Table 1) that taraxasterol and its derivatives are widely distributed in various species belonging to the family Compositae though some sporadic references of their isolation from few other species of different families are reported from time to time. The wide distribution of the above terpenoids in plants belonging to the family Compositae indicates that these plants most plausibly contain specific enzyme—systems which are responsible for elaborating such type of compounds. Further chemical studies on a large number of genus belonging to this family would be necessary in order to prove our contention.

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