the Herbarium of the Department of Systematic Botany, University of Uppsala, Sweden and identified by Prof. Mats Thulin of this Department in Collaboration with Ahmed M. Warfa, Faculty of Agriculture, Somali National University, Mogadishu, Somalia.

Extraction and purification. The fresh aerial parts from *K. pendula* (725 g) were pulverized and steam distilled for 3 hr in an all glass apparatus (5 l). The distillate was extracted with 30–40° petrol, dried over anhydrous Na_2SO_4 and the solvent evaporated *in vacuo*. The essential oil (0.5 g; 0.69 % yield) was submitted to flash chromatography on silica gel (Kieselgel 60) using hexane containing increasing amounts of Et_2O (0–30 %), as eluent. The hydrocarbon fraction was further fractionated by HPLC (eluent hexane) and afforded myrcene (65 mg, 13 %), β-elemene (20 mg, 4 %) and α-humulene (20 mg, 4 %). The fractions containing oxygenated sesquiterpenes were fractionated by HPLC (hexane-EtOAc, 9:1) and yielded T-cadinol (22 mg, 4.4 %) and compound 1 (24 mg, 4.8 %), $[\alpha]_D = 32.8$ ($CHCl_3$; *c* 0.7). HRMS: found 222.1992 ($C_{15}H_{26}O$ requires 222.1985).

Isolated guinea-pig ileum test. This was performed as described in refs [7, 8]. The ileum was suspensed in Krebs solution (5 ml) bubbled with 95 % O_2 and 5 % CO_2 at 36–37°. Contractions were recorded by means of transducers (Grass FT03) and a Grass 79 polygraph equipped with pre-amplifier, main amplifier, oscillograph and time and event marker. The sample (10 mg) was dissolved in 250 μl 30 % aq. EtOH. At a concentration in the bath of 0.4 mg/ml the sample caused inhibition of electrically induced contractions of the guinea-pig ileum. The decrease of the twitch response was 57 % compared to the response before addition of the sample.

Acknowledgements—We wish to thank the traditional healer Mr. Hassan Cabdulle (Taynax), who introduced us to the plant and its use, and Professor Gunnar Samuelsson, who allowed us to perform the isolated guinea-pig ileum test in the Department of Pharmacognosy, University of Uppsala, Sweden. Mass spectral data were provided by 'Servizio di Spettrometria di massa del C.N.R. e dell'Università di Napoli'. The assistance of the staff is gratefully acknowledged.

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THE VOLATILE PHYLLODE OIL OF *ACACIA SPIRORBIS*[*]

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Key Word Index—*Acacia spirorbis*; Mimosaceae; volatile phyllode oil; mono - and sesquiterpenoids.

Abstract—The steam volatile phyllode oil of *Acacia spirorbis* was found to be predominantly sesquiterpenoid in character. The most abundant sesquiterpenoids were β-caryophyllene, viridiflorene and viridiflorol. The monoterpenoids α-terpineol, terpinyl acetate, 1,8-cineole and limonene were also present in significant proportions.

INTRODUCTION

Acacia spirorbis Labill. (Mimosaceae), locally known as 'gaïac', is a shrub or small, much branched tree growing on schists, various ultrabasics and limestones in New Caledonia and the Loyalty Islands. Previous chemical work has revealed the presence of two alkaloids, N_α-*trans*-cinnamoylhistamine in the bark of roots and leafy stems, and hordenine in the trunk bark [1]. This communication presents the results of a detailed examination of the volatile oil obtained by steam distillation of fresh phyllodes.

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[*] Part 112 in the series 'Plants from New Caledonia'; for part 111 see: Libot, F., Miet, C., Kunesch, W., Poisson, J., Pusset, J., Sévenet, T., Duhet, D., Guegan, P. and Debray, M. M. *Plantes Médicinales et Phytothérapie* (to be published).

Table 1. % Composition of *A. Spirorbis* phyllode oil

Peak No	Compound	%
1	α-Pinene	1.5
2	Camphene	tr
3	β-Pinene	tr
4	Myrcene	tr
5	α-terpinene	tr
6	Limonene	2.3
7	1,8-Cineole	4.0
8	γ-Terpinene	0.9
9	*p*-Cymene	1.4
10	Terpinolene	0.9
11	α,*p*-Dimethylstyrene	0.2
12	α-Cubebene	tr
13	$C_{15}H_{24}$	1.1
14	α-Copaene	0.3
15	α-Gurjunene	0.7
16	Linalool	0.2
17	β-Elemene	0.1
18	Terpinen-4-ol	0.5
19	β-Caryophyllene	14.1
20	Aromadendrene	2.7
21	α-Bulnesene	1.0
22	Alloaromadendrene	4.2
23	Humulene	2.3
24	α-Terpineol	5.8
25	Terpinyl acetate	4.0
26	Viridiflorene	26.3
27	β-Selinene	2.5
28	α-Selinene	1.4
29	δ-Cadinene	2.1
30	γ-Cadinene	1.0
31	$C_{15}H_{24}$	0.1
32	$C_{15}H_{24}$	0.1
33	$C_{15}H_{24}$	0.1
34	Calamenene	0.1
35	*p*-Cymen-8-ol	tr
36	Geraniol	tr
37	Calacorene	0.1
38	$C_{15}H_{24}O$	tr
39	Palustrol	0.4
40	$C_{15}H_{26}O$	0.1
41	$C_{15}H_{26}O$	0.1
42	$C_{15}H_{26}O$	1.8
43	Ledol	0.9
44	Viridiflorol	14.2

tr: <0.1%.

RESULTS AND DISCUSSION

Gas liquid chromatography of the pale greenish-yellow oil indicated the presence of at least 50 constituents, 36 of which were identified. In addition the molecular formulae of another eight constituents were tentatively derived from their molecular ions (Table 1). All remaining unknown peaks were present in trace amounts only. Whilst the monoterpenoids are unexceptional it is noteworthy that half of the largely sesquiterpenoid oil is made up of the structurally and biogenetically related compounds bulnesene, aromadendrene, alloaromadendrene, viridiflorene, palustrol, ledol and viridiflorol.

Even more interesting is the fact that, to our knowledge, this is only the second report of the occurrence of a volatile phyllode oil in the genus *Acacia*. A small amount of a lemon scented oil, probably rich in citronellal, has been obtained some years ago by Southwell (unpublished results) from the phyllodes of the Central Australian species *Acacia hilliana*. Its phyllodes were quite sticky owing to the presence of a resinous coating and the volatile oil may have been present in it rather than being secreted within the phyllodes themselves. The phyllodes of *A. spirorbis* are devoid of a sticky surface coating.

EXPERIMENTAL

Collection of plant material and isolation of volatile oil. Phyllodes and terminal branchlets of trees growing at Koné on the west coast of New Caledonia, were steam distilled yielding 0.1% of a pale greenish-yellow, viscous oil, n_D^{20} 1.4941; α_D + 11.2°; $d_{20°/4°}$ 0.9267.

Analysis of oil and identification of constituents. The oil was analysed by GC-MS as described elsewhere [2] using a Milton Roy CI 10 electronic integrator to determine percentages of individual constituents. Compounds were identified by comparison of their mass spectra with those of authentic material or with published spectra [3, 4] as well as by comparison of their retention times with those of authentic materials. The identity of peaks nos 1–10, 16, 18–20, 23–25, 43 and 44 was also confirmed by co-injection.

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