

GC MS Study of Essential Oil of *Heracleum candicans* Wall.

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Manuscript received 5 July 1993, revised 30 October 1996, accepted 26 November 1996

Heracleum candicans, locally known as 'Chhataya', is an erect perennial herb and grows in temperate regions. Locally the plant powder is used in nerve disorders and fruits are used as spices. Earlier workers have studied the plant from different viewpoints¹. The plant roots contain bergapton, heraclenol, isopimpinallin, xanthotoxin and suberasin². Charma *et al.*³ showed the presence of α - and β -pinene, carveol acetate, phenylpropionaldehyde, phenylethyl acetate, phenylpropyl acetate and dihydrocarveol in the essential oil of *H. candicans*. The present communication reports the identification of the main constituents of the essential oil of the leaves of *H. candicans* by GC MS study.

The plants were collected from Nainital in the month of July and the leaves were hydrodistilled to get the essential oil which was collected over petroleum ether and dried

over anhydrous sodium sulphate. The oil was analysed directly by a Hewlett-Packard 5840 A GC interfaced with a Hewlett-Packard 5985 mass spectrometer (injection temp., 240°; detector temp., 280°; initial temp., 100°; programming rate, 2°/min; total run time, 35 min). The mass spectral data corresponding to the GC peaks were analysed and the compounds were identified by comparison of the mass spectra with the reference spectra available in the literature.

The results revealed the presence of mainly nine compounds. The retention times, percentage compositions and mass fragmentation data are given in Table I. Eight of the compounds were identified as germacrene-D, γ -amorphene, guaiene, α -humulene, *trans*- α -bergamotene, caryophyllene, β -bisabolene and δ -cadinene⁴. The other compound could not be identified.

Acknowledgement

The authors wish to thank the Head of the Chemistry Department, D. S. B. Campus, Kumaun University, Nainital, for facilities and Prof. Vasu Dev, Department of Chemistry, California State Polytechnic University, Pomona, California, U.S.A., for GC MS study.

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TABLE I—GC MS DATA OF THE ESSENTIAL OIL

Peak no	RT in min	% in the oil*	m/z			Compounds identified
			Mol. ion peak	Base peak	Other fragments	
1	22.68	7.69	204	105	161, 119, 93	Germacrene-D
2	25.28	28.90	204	93	133, 129, 105, 69	γ -Amorphene
3	26.20	3.82	204	105	189, 147, 133, 93	Guaiene
4	27.02	9.58	204	93	147, 121, 107, 80	α -Humulene
5	29.35	4.79	204	93	119, 107, 79, 69	<i>trans</i> - α Bergamotene
6	29.60	21.08	204	93	121, 107, 79, 68	Caryophyllene
7	30.15	9.68	204	93	123, 107, 79, 69, 55	β -Bisabolene
8	30.97	4.78	204	161	134, 119, 105, 91	δ -Cadinene
9	33.30	1.91	204	111	123, 95, 85, 71, 57	—

*In the gas chromatogram of the oil sample there was a peak at retention time 18.0 min (7%) which corresponded to low-boiling fraction. As our interest was on sesquiterpenoids the GC MS of the peak could not be illustrated well. The remaining 0.77% appeared in the form of several peaks spread over the spectrum in insignificant amount.