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Short Communication

Essential Oil Constituents of *Echinophora platyloba* DC.

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Abstract

The hydrodistilled oil of the aerial parts of *Echiophora platyloba* DC. was analyzed by GC and GC/MS. Ten components have been identified, of which the major constituents were found to be trans-β-ocimene (67.9%), 2-furanone (6.2%), myrcene (6.0%), linalool (3.1%), and cis-β-ocimene (2.3%).

Keyword: *Echinophora platyloba*; Umbelliferae; Essential oil composition; Trans-β-ocimene.

Introduction

The genus *Echinophora is* (Umbelliferae, subfamily Apioideae, tribe Echinophoreae) represented in the flora of Iran by four species including two endemics (1-3). These are: *E. sibthorpiana* Guss., *E orientalis* Hedge et Lamond and two endemic species, which are *E. platyloba* DC. and *E. cinerea* (Boiss.) Hedge et Lamond (2). In Iran, fresh and dried aerial parts of some of these species are added to cheese and yoghurt for flavoring. The genus *Echinophora* has been the subject of scant phytochemical and biological investigations. *E. platyloba is* locally known as "Khosharizeh" (2). A view of literature has not revealed any previous work on the oil of *E. platyloba*. However, oils from other *Echinophora* species have been the subject of several studies (4-11). The plant is one of the Iranian endemic species, which could be found in some central and western provinces of the country (12).

Experimental

Collection of plant materials

Aerial parts of the plant were collected from Alvand Mountain, Golpaygan-Khomein Road, at an altitude of 1750 m on June 1999. Voucher specimens of the plant (E25) are available at the Herbarium of the Faculty of Pharmacy and Pharmaceutical Sciences, Isfahan University of Medical Sciences, Isfahan, I.R. Iran.

Air-dried aerial parts of *E. platyloba* were ground and subjected to hydrodistillation for 4 h, using Clevenger-type apparatus.

Analysis

Gas chromatography analysis was carried out on a Perkin-Elmer 8500 gas chromatograph with FID detector and a BP-1 capillary column (39 m x 0.25 mm; film thickness 0.25 μm). The carrier gas was helium with a flow rate of 2 ml/min. The oven temperature for the first 4 min was kept at 60°C and then increased at a rate of 4°C/min until reached a temperature of 280°C. Injector and detector temperatures were also set at 280°C.

The mass spectra were recorded on a Hewlett Packard 6890 MS detector coupled with Hewlett Packard 6890 gas chromatograph equipped with a HP-5MS capillary column (30 m x 0.25 mm; film thickness 0.25 μm). The gas chromatography condition was as mentioned above. The mass spectrometer condition was as follows: ionized potential 70eV and source temperature 200°C.

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Identification of constituents present was based on computer matching against the library spectra (Wiley275L), built up using pure substances and components of known constituents, MS literature data and evaluation of fragmentation patterns of compounds and their confirmation by gas chromatography retention times (13). The percentage of essential oil composition was computed from gas chromatography peak areas, without using correction factors. A series of hydrocarbon standards (C_9-C_{18}) were also used to calculate Kovats indices from the gas chromatography analysis. Kovats indices were calculated by the Kovats equation. Identification was based on retention indices and comparison of mass spectra with the literature (13, 14).

Results and Discussion

Results of chromatographic analysis of *E. platyloba* oil are presented in Table 1.

The identified constituents were 2-butenal, myrcene, ρ-cymene, limonene, cis-β-ocimene, trans-β-ocimene, linalool, *ρ*-mentha-1, 5, 8-triene, cis-3-hexenyl 2-methyl butanoate, and 2-furanone. Trans-β-ocimene (67.9%) was the main constituent of the oil and the major components were 2-furanone (6.2%), myrcene (6.0%), linalool (3.1%), and cis-β-ocimene (2.3%). Earlier reports indicated that *E. sibthorpiana* contains methyl eugenol and *E. lamondiana* contains δ-3-carene as the major constituents of their oils (10, 11). In the *E. chrysantha oil,* α-phellandrene was identified as the major compound (15).

The composition of *E. platyloba* oil was found to be rich in monoterpenes (83.5%), with a predominance of hydrocarbons (80.4%). The essential oil of *E. platyloba* could be considered as a source of hydrocarbon monoterpenes, especially the trans-β-ocimene

No.	Compound	Percentage	Retention Index
1	2-butenal	1.8	870
2	myrcene	6.0	989
3	ρ-cymene	1.2	1021
4	limonene	1.5	1025
5	cis-β-ocimene	2.3	1034
6	trans-β-ocimene	67.9	1047
7	unknown	1.4	1095
8	linalool	3.1	1098
9	ρ-mentha-1,5,8-triene	1.5	1127
10	unknown	2.2	1207
11	cis-3-hexenyl 2-methyl butanoate	2.0	1229
12	unknown	2.9	1271
13	2-furanone	6.2	1466

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