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GC-MS Analysis of *N*-Hexane Extract of *Epaltes divaricata* (L.) Cass

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The investigation was carried out to determine the possible chemical components of *Epaltes divaricata* (L.) Cass. Whole plant using GC-MS analysis of *n*-hexane extract which led to identification of 11 compounds. Not much information available on phytochemical components of *Epaltes divaricata* (L.) Cass. This is the first attempt to investigate the GC-MS analysis of *n*-hexane extract of this plant. The analysis revealed that this plant contains mainly *n*-hexadecanoic acid (Rt 22.48); 9,12-octadecadienoic acid (*Z,Z*) (Rt 24.67); hexacosane (Rt 31.06) observed found to be 5.06, 6.03 and 6.60% respectively. The content of hexatriacontane (Rt 32.30) was found to be 14.36%.

Keyword: *Epaltes Divaricata* (L.) Cass., GC-MS Analysis, *N*-Hexane Extract

1. Introduction

The plants of the genus *Epaltes* (Asteraceae) are used in traditional Ayurvedic medicine in Sri Lanka as diaphoretic, diuretic and stimulating expectorant and also cure various ailments viz. alleviate jaundice, urethral discharges and acute dyspepsia^[1]. The roots are used as astringent and tonic^[2]. *Epaltes divaricata* (L.) Cass. is one of the species of this genus, it is a small glabrous annual herb, 25 to 30 cm high with branched stem and aromatic roots. It is region specific found in Sri Lanka, also available in South India in minor quantity^[3-8]. The chemical constituents of five closely related eudesmane derivatives have been isolated from the acetone extract of this plant^[9]

The present investigation was carried out to determine the possible chemical components from *Epaltes divaricata* whole plant by GC-MS

2. Materials and methods

2.1 Plant material

Plant material was collected from Tirunelveli Dist of Tamilnadu. The botanical identity of the plant was confirmed by Dr. S. Amerjothy, Former Dean of Science and H.O.D., Department of Plant Biology and Plant Biotechnology, Presidency College Chennai – 600005. The voucher specimen (00629) is deposited in the department of Botany, Captain Srinivasa Murti Drug Research Institute for Ayurveda, Chennai for future reference.

2.2 Preparation of Extract

The shade dried powdered plant of *E. divaricata*, (4 g) were successively extracted with *n*-hexane, chloroform, ethyl acetate, and alcohol (95%) separately using Soxhlet apparatus. The extracts were filtered and distilled on a water bath and

finally dried in vacuo. The *n*-hexane extract of the plant was used for GC-MS analysis.

2.3 Instruments and Chromatographic Conditions

Gas chromatography combined with mass spectroscopy is a preferable methodology for routine analysis of compounds. *n*-Hexane extract of the plant was injected into the Gas chromatography unit Shimadzu GC-MS QP2010 was the instrument used for GC-MS analysis. It is separated into various constituents with different retention time which are detected by mass spectrophotometer. The chromatogram a plot of intensity against retention time was recorded by the software attached to it. From the graph the compounds are identified comparing the data with the existing software libraries like WILEY08, NIST08 and NIST08s.

1 μ l of the *n*-hexane extract of the plant was injected into GC. The injector temperature was maintained at 250°C. The detector used was

flame ionization detector which was maintained at 280°C. The pressure of the carrier gas, nitrogen was kept at 10 psi. The oven temperature was set at 60°C to 280°C with a gradual increment of 10°C per min. The injected extracts was eluted in the DB-5 MS column of 30 m long and 0.25 mm inner diameter and the eluted constituents were detected by flame ionization detector and the GC chromatogram was recorded.

3. Results and Discussion

3.1 GC-MS analysis

GS-MS chromatogram of the *n*-hexane extract study showed 11 peaks in *E. divaricata*, besides a number of peaks with very narrow retention time. The fragmentation patterns for some of the peaks were compared with that of the library of compounds. The *n*-hexane extract constituents along with their retention time and percentage area and superimposibility obtained from the GC-MS analyzer are tabulated in Table 1 and Fig. 1.

Table 1: GC-MS Data of *n*-hexane extract of *E. divaricata*

Retention time (Min.)	Compound name	Area %	Super impossibility %
9.033	Hexadecane	1.13	93
13.542	<i>n</i> -Eicosane	1.19	93
19.933	Neophytadiene	0.75	96
21.375	Tetratriacontane	1.14	89
21.975	<i>n</i> -Hexadecanoic acid	5.06	94
22.483	Ethyl Hexadecanoate	1.30	93
24.675	9,12-Octadecadienoic acid (<i>Z,Z</i>)	6.03	96
31.067	Hexacosane	6.60	97
32.300	<i>n</i> -Hexatriacontane	14.36	96

The GC/MS profiles were used and identified eleven constituents in *E. divaricata*. The percentage content of compounds are *n*-hexadecanoic acid (Rt 21.97); 9,12-octadecadienoic acid (*Z,Z*) (Rt 24.67); hexacosane (Rt 31.06) observed found to be 5.06,

6.03 and 6.60% respectively. Regarding the content of hexatriacontane (Rt 32.30) it was found to be 14.36%. Other constituents were < 2%.

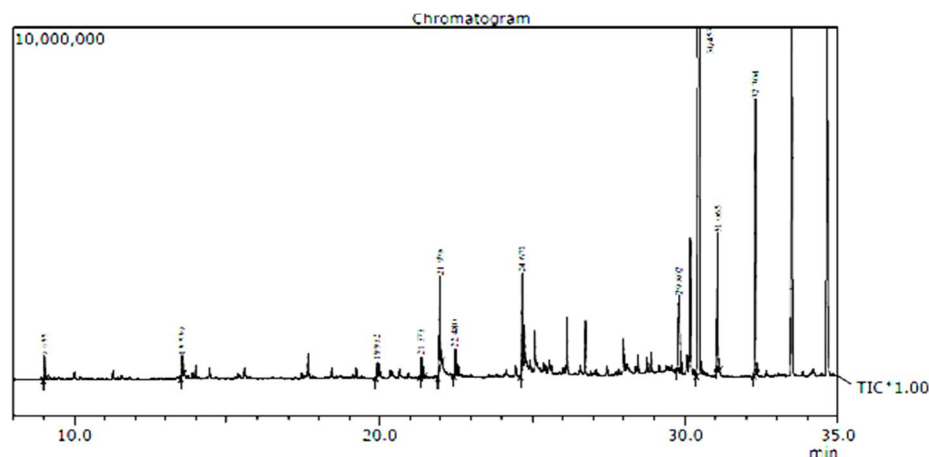


Fig.1: GC-MS chromatogram of the n-hexane extract of *E. divaricata*

4. Conclusion

In the present study eleven chemical constituents have been identified from n-hexane extract of the whole plant of *Epaltes divaricata* by Gas Chromatogram Mass spectrometry (GC-MS) analysis. The presence of various phytochemicals contributes to the medicinal activity of the plant.

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