



ISSN No: 0975-7384
CODEN(USA): JCPRC5

J. Chem. Pharm. Res., 2011, 3(3):477-480

**GC-MS analysis of the methanolic extract of the leaves of
Dipteracanthus patulus (Jacq.) Nees.**

S. Gopalakrishnan^{1*}, K. Saroja² and J. Dulcy Elizabeth³

¹Department of Pharmaceutical Chemistry, Manonmaniam Sundaranar University, Tirunelveli, Tamil Nadu, India

²Department of Botany, Sri Parasakthi College for Women (Autonomous), Courtallam, Tamil Nadu, India

³Department of Botany, St. Mary's College, Thoothukudi, Tamil Nadu, India

ABSTRACT

Dipteracanthus patulus (Jacq.) Nees. (Syn. *Ruellia patula* Jacq.) (Acanthaceae) is a medicinal herb traditionally used in the treatment of wounds. The methanolic extract of the leaves of *Dipteracanthus patulus* was analyzed by gas chromatography-mass spectrometry (GC-MS). Seventeen compounds were identified which included n-Hexadecanoic acid, 9,12-Octadecanoic acid (Z, Z) -, Linoleic acid ethyl ester.

Keywords: *Dipteracanthus patulus*; leaves; n-Hexadecanoic acid; 9,12, Octadecanoic acid (Z, Z), Linoleic acid ethyl ester.

INTRODUCTION

Dipteracanthus patulus (Jacq.) Nees. Syn. *Ruellia patula* Jacq. (Acanthaceae) commonly known as 'kiranthinayagam' or 'kayappachilai' in Tamil is a medicinal plant traditionally used in the treatment of wounds. In folklore remedies, the leaves are used to treat cuts, wounds and poisonous bites. The plant is commonly distributed on wastelands in Tamil Nadu, India. The leaves are used for treating itches, insect bites, sores, eye diseases, tumours, skin diseases, rheumatic complaints, renal affections, dental problems and insect bites [1-3]. Pharmacological studies indicated its cardiotoxic [4], wound healing [5], antiulcer and antioxidant [6] activities. Two lignan glycosides, 5,5'-dimethoxyariciresinol-9'-O-β-D-glucopyranoside and lyoniresinol-9'-O-β-D-glucopyranoside were isolated from the extracts of whole plant of *D.*

patulus [7]. The present communication deals with the GC-MS analysis of the methanolic extract of the leaves of *Dipteracanthus patulus*.

EXPERIMENTAL SECTION

Plant Material

The leaves of *Dipteracanthus patulus* were collected from Courtallam (9° 15' N, 77° 30' E). The plant was identified by Dr. V. Chelladurai, Survey of Medicinal and Aromatic plants Unit–Siddha, CCRAS, Palayamkottai, Tamil Nadu, India and a voucher specimen (SMC3131) has been deposited at Department of Botany, St. Mary's College Thoothukudi, Tamil Nadu, and India. The leaves of *Dipteracanthus patulus* were dried in shade and powdered. The leaf powder (1Kg) was soxhlet-extracted successively with petroleum ether (40°-60°C), benzene, chloroform and methanol. The extracts were concentrated under reduced pressure in a rotary evaporator (Buchi, USA).

Gas Chromatography-Mass Spectrometry

The methanolic extract of the leaves of *D. patulus* was subjected to GC-MS analysis on a GC-MS Clarus 500 Perkin Elmer system comprising a AOC- 20i autosampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions: column Elite-1 fused silica capillary column (30mm x 0.25mm ID x 1 μMdf, composed of 100 % Dimethyl poly siloxane), operating in electron impact mode at 70 eV; helium (99.999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5 μl was employed (split ratio of 10:1); injector temperature 250°C. The oven temperature was programmed from 110°C (isothermal for 2 min), with an increase of 10°C/min, to 200°C, then 5 °C / min to 280°C, ending with a 9 min isothermal at 280°C. Mass spectra were taken at 70 eV; a scan interval of 0.5 seconds and fragments from 40 to 550 Da. The mass spectra of the separated components were compared with those stored in the NIST database (NIST version 2.1).

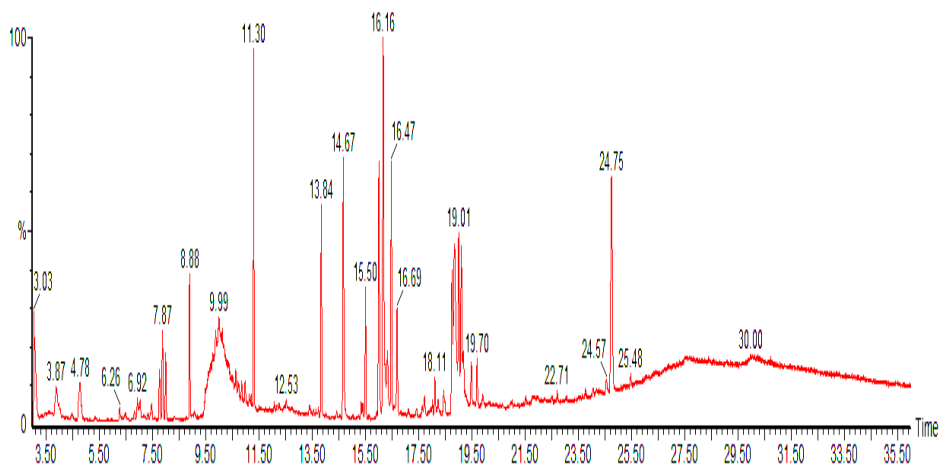


Fig. 1. GC- MS chromatogram of the methanolic extract of the leaves of *Dipteracanthus patulus*

RESULTS AND DISCUSSION

GC-MS chromatogram of the methanolic extract of *Dipteracanthus patulus* (Figure-1) showed seventeen peaks indicating the presence of seventeen compounds. The chemical compounds identified in the methanolic extract of the leaves of *Dipteracanthus patulus* are presented in Table 1. GC-MS analysis revealed the presence of n-Hexadecanoic acid, 9, 12, Octadecanoic acid (Z, Z)-, Linoleic acid, ethyl ester. The polyunsaturated fatty acid (Z,Z)-9,12-octadecadienoic acid (LA), is a conjugated Linoleic acid known as an antioxidant which can protect membranes from harm [8]. Octadeca-9,12-dienoic acid (Z, Z) Octadeca-9,12,15-trienoic acid (alpha-linolenic acid (ALA), and docosahexaenoic acid (DHA) were reported to have anti-inflammatory effects [9].

Table 1. Chemical constituents of the methanolic extract of the leaves of *Dipteracanthus patulus*.

Retention Time	Name of the Compounds	Molecular Formula	Molecular Weight	Peak Area (%)
3.87	Octane,3,3-dimethyl	C ₁₀ H ₂₂	142	3.06
4.78	2,6-Dimethyl-6-trifluoroacetoxyoctane	C ₁₂ H ₂₁ F ₃ O ₂	254	2.67
8.88	Tetradecane	C ₁₄ H ₃₀	198	2.86
9.99	4-hydroxy-2 methylpyrrolidine-2-carboxylic acid,	C ₆ H ₁₁ NO ₃	145	7.94
11.30	Hexadecane	C ₁₆ H ₃₄ S	226	6.68
13.84	Octadecane	C ₁₈ H ₃₈	254	4.93
14.67	1-2-Benzenedicarboxylic acid Bis (2-methylpropyl) ester	C ₁₆ H ₂₂ O ₄	278	8.02
15.50	Hexadecanoic acid, Methyl ester.	C ₁₇ H ₃₄ O ₂	270	3.21
16.00	Dibutyl phthalate	C ₁₆ H ₂₂ O ₄	278	7.75
16.16	n-Hexadecanoic acid	C ₁₆ H ₃₂ O ₂	256	13.41
16.47	Hexadecanoic acid, ethyl ester.	C ₁₈ H ₃₆ O ₂	284	6.49
18.75	9,12-Octadecadienoic acid(z,z)	C ₁₈ H ₃₂ O ₂	280	4.24
18.85	9,12,15- Octadecatrienoic acid, methyl ester (z,z,z)	C ₁₉ H ₃₂ O ₂	292	9.66
19.01	Linoleic acid, ethyl ester	C ₂₀ H ₃₆ O ₂	308	4.13
19.11	9,12,15- Octadecatrienoic acid, ethyl ester (z,z,z)	C ₂₀ H ₃₄ O ₂	306	3.82
19.48	Octadecanoic acid, ethyl ester	C ₂₀ H ₄₀ O ₂	312	1.22
24.75	1,2- Benzene dicarboxylic acid, diisooctyl ester	C ₂₄ H ₃₈ O ₄	390	9.89

Acknowledgment

One of the authors (K.S.) wishes to thank the Management, Sri Parasakthi College for Women (Autonomous), Courtallam-627 802, Tamil Nadu and University Grants Commission, New Delhi for the award of fellowship under Faculty Improvement Programme.

REFERENCES

- [1] KC Murugesamudaliar. Gunapadam (Siddha Materia Medica –Vegetable section [in Tamil],) Part 1, 6th ed. Directorate of Siddha System of Medicine, Madras. **1988**; p.361.
- [2] VK Singh, A.M. Khan. Medicinal Plants and Folklores. In: Glimpses in Plant Research. Vol. IX. Today and Tomorrows' Printers and Publishers, New Delhi. **1990**; 250.
- [3] JW Prakash, RDA Raja, NA Anderson, C Williams, GS Regini, K Bensar, R Rajeev, S Kiruba, S Jeeva, SSM Das. *IJTK*. **2008**, 7, 410-413.
- [4] MF Akhtar, S Rashid, M Ahmed. *Journal of Islamic Academy of Sciences*, **1992**, 5, 67-71.
- [5] K Saroja, J Dulcy Elizabeth, S Gopalakrishnan. *Pharmacologyonline*, **2009**, 2,462-469.

- [6] A Manikandan, DVA Doss. *Research Journal of Pharmacognosy and Phytochemistry*, **2009**, **1**,198-201.
- [7] M Ahmad, MF Akhtar, T Miyase, S Rashid, K Usmanghani. *Int. J. Pharmacognosy*, **1993**, **31**, 121-129.
- [8] YL Ha, PM Storkson, MW Pariza. *Cancer Res.* **1990**, **50**,1097-1101.
- [9] G Zhao, TD Etherton, KR Martin, JP Vanden Heuvel, PJ Gillies, SG West, PM Kris-Etherton. *Biochem. Biophys. Res. Commun.*, **2005**, 336,909-917.