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GC-MS Analysis of bioactive components on the bark extract of *Alseodaphne semecarpifolia Nees (Lauraceae)*

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ABSTRACT

The present study of phytochemical analysis in the bark powder extract with absolute alcohol, the phytochemical compound screened by GC-MS method. In this GC-MS analysis, 28 bioactive phytochemical compounds were identified in stem bark of Alseodaphne semecarpifolia.The 28 compounds predominantly phenolic derivatives are present included Hydrocarbons, Carbohydrates, Fatty Acid, Fatty Acid ester, Alcoholic compounds, Alkaloids, Ketones and Alkenes compounds. These different active phytochemicals have been found to possess a wide range of activities, which may help in the protection against incurable diseases.

Key words: GC-MS, Phytochemicals, *Alseodaphne semecarpifolia* nees.

INTRODUCTION

Today natural products derived from plants are being tested for presence of new drugs with new modes of pharmacological action. A special feature of higher plants is their capacity to produce a large number of secondary metabolites [1]. Recent studies are involved in the identification and isolation of new therapeutic compounds of medicinal importance from higher plants for specific diseases [2,3]. Knowledge of the chemical constituents of plant is helpful in the discovery of therapeutic agent as well as new sources of economic materials like oil and gums. The most important bioactive constituents of the plants are alkaloids, tannins, flavonoids and phenolic compounds. In India large number of plant species had been screened for their pharmacological properties but still a vast wealth of endangered species are unexplored. Medicinal plants are at interest to the field of biotechnology, as most of the drug industries depend in part on plants for the production of pharmaceutical compounds. [4]

Alseodaphne semecarpifolia belongs from Lauraceae (Laurel family) it is commonly known as Nelthare, in Tamil kanaippirandai, armbamaram. Nelthare is a large evergreen tree up to 18 m tall, found in peninsular India. Bark is brownish, scaly and flaky. Leaves are alternately, spirally arranged and clustered at twig ends. Leaf stalks are stout 0.7-2 cm long. Leaves are 7-16 cm long, 4-8.5 cm broad, obovate, tip blunt or rounded, sometimes notched. Leaf base is wedge-shaped. Leaves are leathery, hairless and glaucous beneath. Midrib is slightly raised above; tiny yellowish flowers are borne in panicles at the end of branches, 10-20 cm long. Flowers have 6 petals which fall off. The fruit is black, round, 1-2 cm across. [5-7] [Fig.1]

A. semecarpifolia in ethno veterinary practices in India the stem bark is used for Rinderpest disease, dysentery in cattles [8] and also juice is applied externally for leach bite [9]. The ethanolic leaves extract of A. semecarpifolia had been studied to possess anti-microbial activities against different pathogens like 20 bacteria and 6 fungus [10]. The aim of the present study is to identify the bio-active phytocomponents of the plant by through GC-MS analysis of the bark extract of A.semecarpifolia. [11-16]

MATERIALS AND METHODS

Collection of plant material

The stem bark and leaves of *Alseodaphne semecarpifolia* were collected from the evergreen forests, Kolli hills, Eastern Ghats of Tamil Nadu, India. They were identified and authenticated by the Raphient herbarium of St.Joseph's College (Autonomous), Tiruchirappalli, Tamil Nadu, India.

Preparation of powder and extract

Stem Bark (1Kg) was shade dried, powdered and extracted with ethanol for 6-8 hours using soxhlet apparatus. The extract was then filtered through muslin, evaporated under reduced pressure and vacuum dried to get the viscous residue. The ethanolic extracts of the plant was used for GC-MS analysis. *1* µl of the ethanolic bark extract of A.semecarpifolia was employed for GC/MS analysis

GC-MS Analysis

The GC-MS analysis of the A.semecarpifolia powder bark extract with in absolute alcohol, was performed using a Clarus 500 Perkin Elmer gas chromatography equipped with a Elite-5 capillary coloum (5% phenyl 95% dimethyl polysiloxane) (30nm X 0.25mm ID X 0.25µmdf) and mass detector turbomass gold of the company which was operated in EI mode. Helium was the carriers gas at a flow rate of 1 ml/min. the injector was operated at 290ºC and the oven temperature was programmed as follows; 50ºC at 8ºC/min to 200ºC (5min) at 7ºC/min to 290ºC (10min).

Identification of components

Interpretation on mass spectrum of GC-MS was done using the database of National Institute Standard and Technology (NIST) having more than 62,000 patterns. The mass spectrum of the unknown component was compared with the spectrum of the known components stored in the

NIST library. The name, molecular weight and structure of the components of the test materials were ascertained. [17-18]

RESULTS AND DISCUSSION

GC-MS chromatogram of the ethanolic bark extract of A.semecarpifolia (Fig-2) showed 28 peaks indicating the presence of twenty-eight compounds. The chemical compounds identified in the ethanolic extract of the bark of A. semecarpifolia are presented in Table 1. GC-MS analysis revealed that the presence of Tridecanoicacid methyl ester, Hexadecanoic-2-oxo methyl ester is showed as minimum percent. The phenolic type compounds are recorded predominantly. (-)-1,2,3,4-Tetrahydroisoquinolin-6-ol-1-carboxylic acid (9.1%), 5-Hydroxy-2,3,3-trimethyl-2-(3-methyl-buta -1,3- dienyl)– cyclohexanone(7.0%), Furo[2,3-b] pyridin-3-amine, 2-benzoyl-4-methoxymethyl-6-methyl (8.6%). Carbohydrates like allose and sucrose are considered amount is present. The GC-MS analyses revealed that the alcoholic extract is mainly composed of oxygenated hydrocarbons and predominantly phenolic hydrocarbons. These phtochemicals are responsible for various pharmacological actions like antimicrobial, anti-oxidant, and anti-inflammation activities. This study is only a preliminary study of the occurrence of certain properties of A.semecarpifolia bark extract an in-depth study will provide a good concrete base for all the biochemical and phytochemical functions mentioned above. New scientific strategies for the evaluation of natural products with specific biological activities require the implementation of large screening process.

Fig 1. *Alseodaphne semecarpifolia*

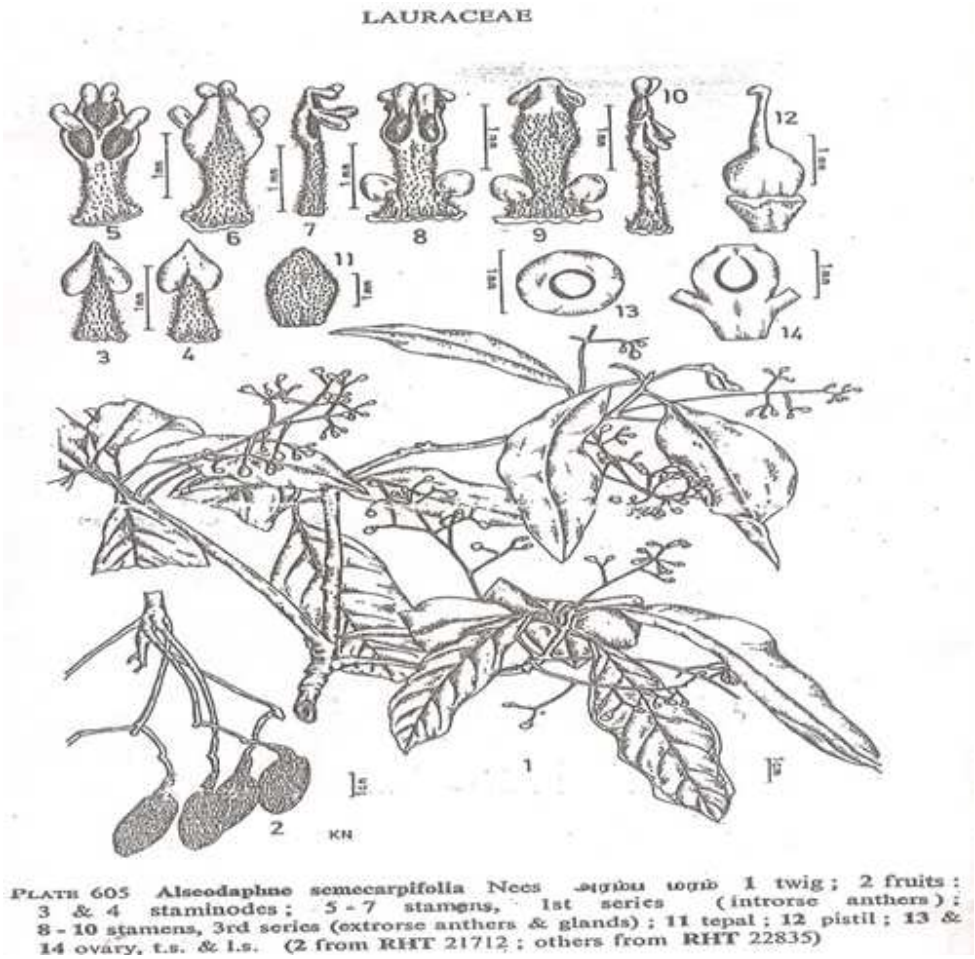
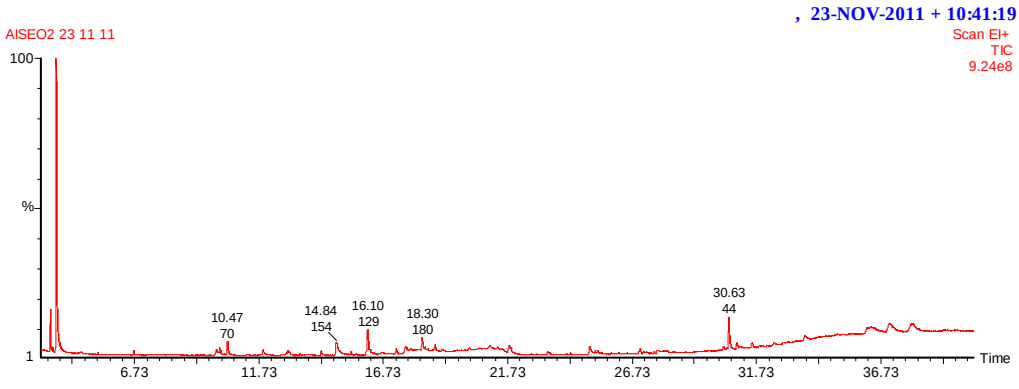


PLATE 605 **Alseodaphne semecarpifolia** Nees 1 twig ; 2 fruits ; 3 & 4 staminodes ; 5 - 7 stamens, 1st series (introrse anthers) ; 8 - 10 stamens, 3rd series (extrorse anthers & glands) ; 11 tepal ; 12 pistil ; 13 & 14 ovary, t.s. & l.s. (2 from RHT 21712 ; others from RHT 22835)

Fig 2.GC-MS Profile of bark extract of *Alseodaphne semecarpifolia*



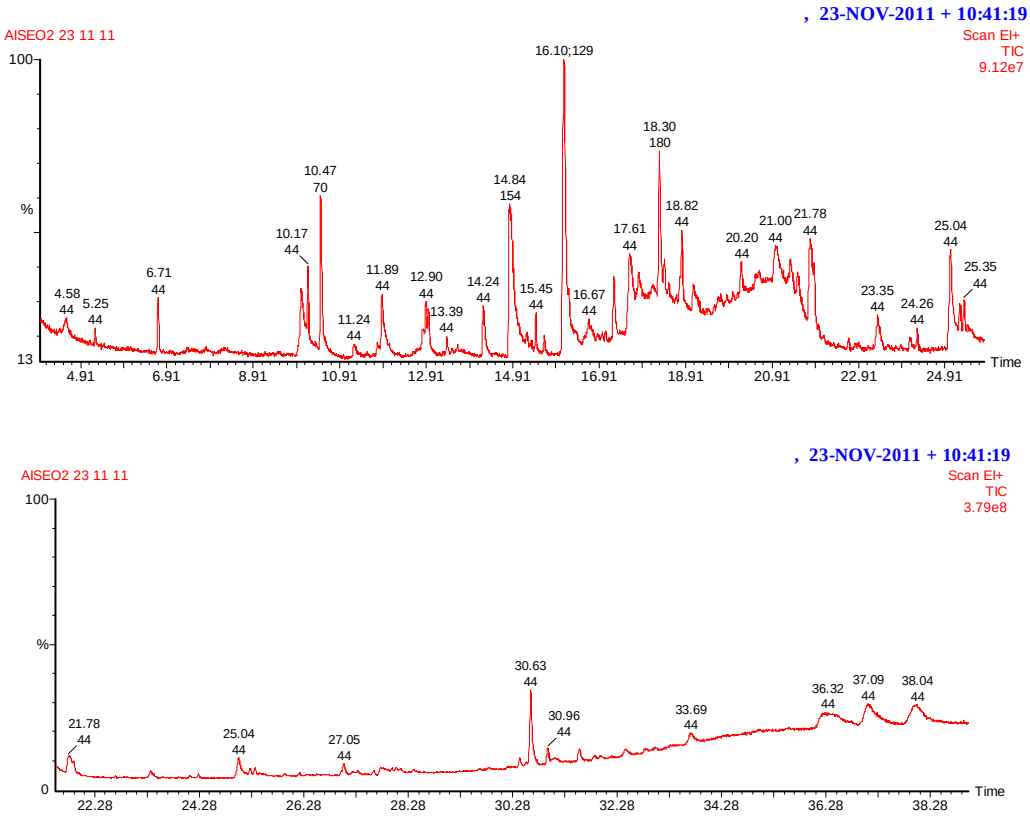
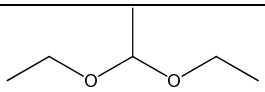
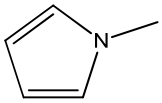
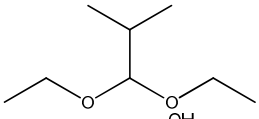
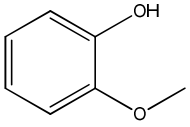
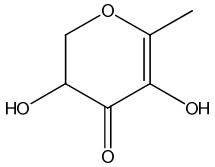
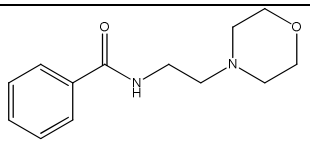
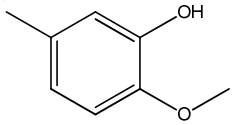
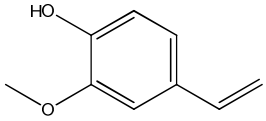
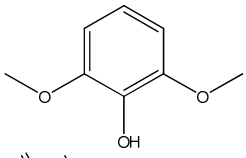
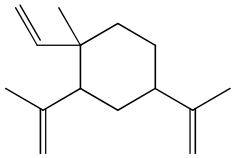
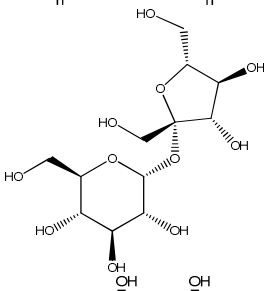
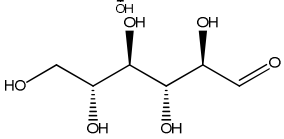
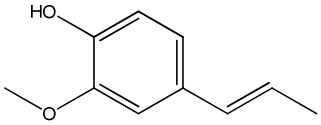
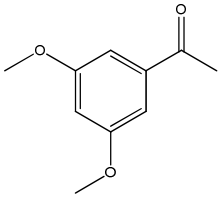
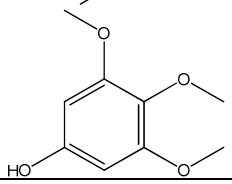
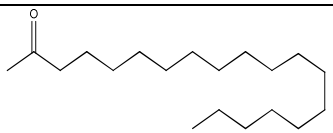
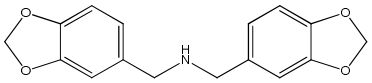
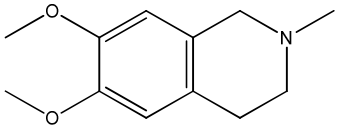
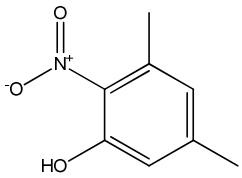
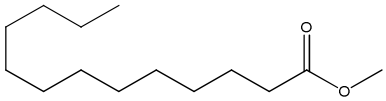
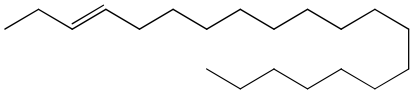
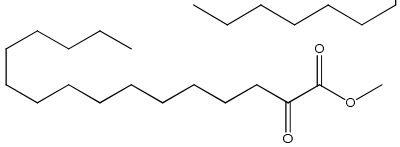
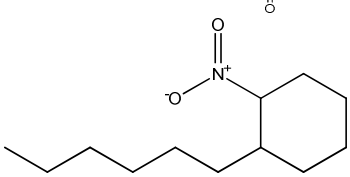
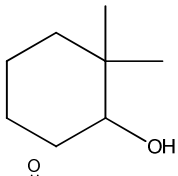
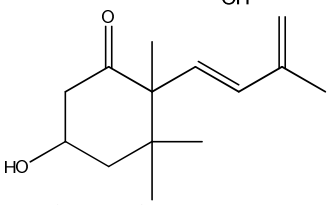
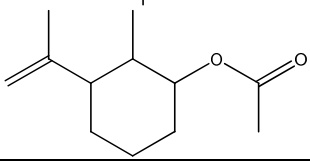
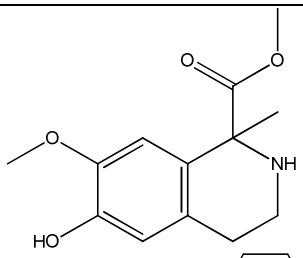
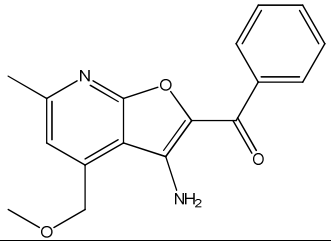


Table 1. To identified phytochemical compounds present in the bark extract of A.semecarpifolia– using GCMS

S. No.	Phytochemical compound	Retention time	%Peak area	Structure
1.	Name: Ethane, 1,1-diethoxy- Formula: C6H14O2 MW: 118	3.35	3.8114	
2.	Name: 1H-Pyrrole, 1-methyl- Formula: C5H7N MW: 81	3.59	44.574	
3.	Name: Propane, 1,1-diethoxy-2-methyl- Formula: C8H18O2 MW: 146	5.25	0.1539	
4.	Name: Phenol, 2-methoxy- Formula: C7H8O2 MW: 124	10.01	2.0469	
5.	Name: 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl- Formula: C6H8O4 MW: 144	11.24	0.3786	

6.	Name: N-(2-Morpholinoethyl)benzamide Formula: C13H18N2O2 MW: 234	11.79	0.2176	
7.	Name: 2-Methoxy-5-methylphenol Formula: C8H10O2 MW: 138 Isocreosol	11.89	1.8809	
8.	Name: 2-Methoxy-4-vinylphenol Formula: C9H10O2 MW: 150	14.24	1.1389	
9.	Name: Phenol, 2,6-dimethoxy- Formula: C8H10O3 MW: 154	14.84	6.7277	
10.	Name: Cyclohexane, 1-ethenyl-1-methyl-2,4-bis(1-methylethenyl)- Formula: C15H24 MW: 204	15.45	0.3429	
11.	Name: Sucrose Formula: C12H22O11 MW: 342	16.67	0.7914	
12.	Name: D-Allose Formula: C6H12O6 MW: 180	17.61	1.7792	
13.	Name: Phenol, 2-methoxy-4-(1-propenyl)- Formula: C10H12O2 MW: 164	17.83	0.4611	
14.	Name: 3', 5'-Dimethoxyacetophenone Formula: C10H12O3 MW: 180	18.30	2.0426	
15.	Name: Phenol, 3,4,5-trimethoxy- Formula: C9H12O4 MW: 184 Antiarol	19.09	0.6000	

16.	Name: 2-Nonadecanone Formula: C19H38O MW: 282	20.20	0.5083	
17.	Name: Di(3,4,methylenedioxy)benzylamine acetate Formula: C18H17NO5 MW: 327	21.00	1.3524	
18.	Name: Isoquinoline, 1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl- Formula: C12H17NO2 MW: 207	21.33	0.5151	
19.	Name: Phenol, 3,5-dimethyl-2-nitro- Formula: C8H9NO3 MW: 167	21.78	2.8695	
20.	Name: Tridecanoic acid, methyl ester Formula: C14H28O2 MW: 228	24.26	0.2399	
21.	Name: 3-Eicosene, (E)- Formula: C20H40 MW: 280	25.35	0.3335	
22.	Name: Hexadecanoic acid, 2-oxo-, methyl ester Formula: C17H32O3 MW: 284	25.91	0.2756	
23.	Name: 1-Hexyl-2-nitrocyclohexane Formula: C12H23NO2 MW: 213	26.20	0.1660	
24.	Name: Cyclohexanol, 2,2-dimethyl- Formula: C8H16O MW: 128	30.42	0.7681	
25.	Name: 5-Hydroxy-2,3,3-trimethyl-2-(3-methyl-buta-1,3-dienyl)-cyclohexanone Formula: C14H22O2 MW: 222	30.63	7.0713	
26.	Name: Cyclohexanol, 2-methyl-3-(1-methylethenyl)-, acetate, (1à,2à,3à)- Formula: C12H20O2 MW: 196	30.96	1.1561	

27.	Name: (-)-1,2,3,4-Tetrahydroisoquinolin-6-ol-1-carboxylic acid, 7-methoxy-1-methyl-, methyl ester Formula: C13H17NO4 MW: 251	37.09	9.1548	
28.	Name: Furo[2,3-b]pyridin-3-amine, 2-benzoyl-4-methoxymethyl-6-methyl- Formula: C17H16N2O3 MW: 296	38.00	8.6415	

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REFERENCES

[1] Castello MC, Phattak.A, Chandra N, Sharon M, *Indian J Exp. Biol*., **2002,** 40, 1378.
[2] Ertuk O, Kati H ,Yayli N, Demirbag Z, *Turk J. Biol*., **2006,** 30,17.
[3] Kumar AR, Subburathinam KM, Prabaker G, *Asian J. Microbial. Biotechnol. Environ. Sci*., **2007,** 9, 177.
[4] Velmurugan P, Kamaraj M, Prema D, *International Journal of Phytomedicine*., **2010**, 2, 379.
[5] Gamble J. S, Flora of Presidency of Madras, **1993**, 2, 1226.
[6] Saldanha, Flora of Karnataka, **1996**, 1, 59.
[7] Sasidharan, Biodiversity documentation for Kerala- Flowering Plants, **2004**, 6, 395.
[8] Harsha H, Shripathi V, Hegde G.R, *Indian .J. of Traditional Knowledge.*, **2005**, 4, 253.
[9] Karupusamy S, *Natural Product Radiance.*, **2007**, 6, 436.
[10]Charles A, Alex ramani V, *J. Chem. Pharm. Res*., **2011**, 3, 205.
[11]Moronkola DO, Ogukwe C, Awokoya KN, *Der Chemica Sinica.*, **2011**, 2, 255.
[12] Halimi M, Vahedi H, Lari J, Nasrabadi M, *Der Pharmacia Sinica.*, **2011**, 2, 27.
[13] Nezhadali A, Parsa M, *Adv Appl Sci Res.*, **2010**, 1, 174.
[14] Nezhadali A ,Soleymani Roudi B ,Akbarpour M , *Der Pharma Chemica*., **2009**, 1, 27.
[15] Majid. Halimi Khalil Abad, HooshaoongVahedi, Maliha Nasrabadi, *Der Pharmacia Sinica*, **2011**, 2, 207.
[16] Mohabat Nadaf, Majid Halimi khalil abad, Leila Monfaredi , Marzia Neyestani, *Asian J. Plant Sci. Res*., **2011**, 1, 1.
[17]Nezhadali A, Nabavi M , Akbarpour M, *Der Pharmacia Sinica*, **2010**, 1, 147.
[18] Sathyaprabha G , Kumaravel S , Panneerselvam A, *Adv. Appl. Sci. Res*., **2011**, 2, 51.