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A STUDY ON PHYTOCHEMICAL COMPOSITION, GCMS ANALYSIS OF ETHYL ACETATE EXTRACT OF *HEMIGRAPHIS ALTERNATA*

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ABSTRACT: Hemigraphisalternata (Acanthaceae), a prostrate plant adapted to India, which is also known as Strobilanthesalternata. This perennial herb popular in the name **'Murikootti' or 'Murianpacha**hasanincredible potency of wound healing. Some of the common names are Aluminium plant, Red flame Ivy, Waffle plant, Java Ivy Cemetery plant, Metal leaf, etc. This literature review is intended to study about phytoconstituents and its GCMS analysis.

INTRODUCTION:

Hemigraphisalternata (Acanthaceae), a perennial plant adapted to India, is a versatile tropical low creeping exotic herb that reaches a height of 15 to 30 cm. In Kerala, the plant is popular in the name **'Murikootti' or 'Murianpacha'** because of its incredible potency to heal wounds. Hemigraphis means 'half writing' because the filament of the outer stamen bear brushes. With leaf of metallic purple lustre on upper surface and a solid dark purple on ventral side , the leaves are opposite, ovate to cordate, serrate, crenate, about 2 to 8long and 4 to 6 cm wide, bearing well-defined veins. Flowers are small (1 to 1.5 cm diameter), five lobed, bell shaped with imbricate bracts. These are white in color with faint purple marks within and appear in terminal 2 to 10 cm long spikes. It can be used to treat anaemia, gallstones, haemorroidsetc.The traditional and medicinal system uses the plant products for the treatment of various infectious diseases.They are grouped as alkaloids, glycosides, corticosteroids ,coumarins, flavonoids, and essential oils. Apart from wound healing ,the screening of various bioactive compounds from plants has lead to the discovery of anti-inflammatory, antidiuretic, anti-diabetic, antiulcer activity.

EXPERIMENTAL METHODS:

Preliminary Phytochemical Screening: Shade dried plant material was extracted with hexane, chloroform, ethyl acetate, and 80% methanol, and preliminary phytochemical screening was done by using the standard tests

Flavonoid Test (Shinoda Test): The presence of flavonoids was confirmed by treating the alcoholic plant extract with few fragments of magnesium ribbon and hydrochloric acid. The reaction mixture develops pink, scarlet or crimson red color, indicating the presence of flavonoids.

Saponin Test (Foam Test): 1 ml of each extract shaken with 10 ml of distilled water and it was agitated in a graduated cylinder for 10 min. The formation of persistent honey-comb like froth indicated the presence of saponins.

Test for triterpenoids: The dry crude plant extract (5 mg) was dissolved in chloroform (2 mL) and then acetic anhydride (1 mL) was added to it. Concentrated sulphuric acid (1 mL) was added to the solution. Formation of reddish violet colour shows the presence of triterpenoids.

Phenol Test: When 0.5 ml of FeCl3 (w/v) solution was added to 2 ml of rest solution, the formation of an intense color indicated the presence of phenols.

GAS CHROMATOGRAPHY –MASS SPECTROMETRY ANALYSIS (GC-MS):

The plant material was shade dried and coarsely powdered. 20 g of coarsely powdered leaves was packed in Soxhlet apparatus and extracted by using 250ml solvent like ethyl acetate (approx.2days). The extract was collected. The extract was then filtered through Whatman No. I filter paper and concentrated. The extract obtained was subjected to GC-MS analysis. Gas chromatography Mass spectroscopy analysis of ethyl acetate extract was performed using Shimadzu GC MS model number: QP 2010S, column ELITE-5MS · 30 meter length · 0.25 mm ID · 0.25 µm thickness and software GCMS Solutions Libraries used: NIST 11 & WILEY 8

REPORT AND DISCUSSION

In the GC-MS analysis, 7 bioactive phytochemical compounds were identified in the ethyl acetate fractions of H. *alternata*. The GC-MS retention time (RT) and percentage peak of the individual compounds are presented in Table 1. The identification of phytochemical compounds were based on the peak area, molecular weight and molecular formula. It is evident from this table that all fractions have a complex chemical composition. The major phytoconstituents present in the GC-MS profile of TLC fraction of leaves of H. alternate with its uses is shown in Table 2

The GC-MS spectrum showed presence of more triterpenoids. Compounds identified by GC -MS analysis possess various pharmaceutical applications. The triterpenoids like phytol, squalene and octacosene

identified is used preferably as one of the principal antidiabetic agent.

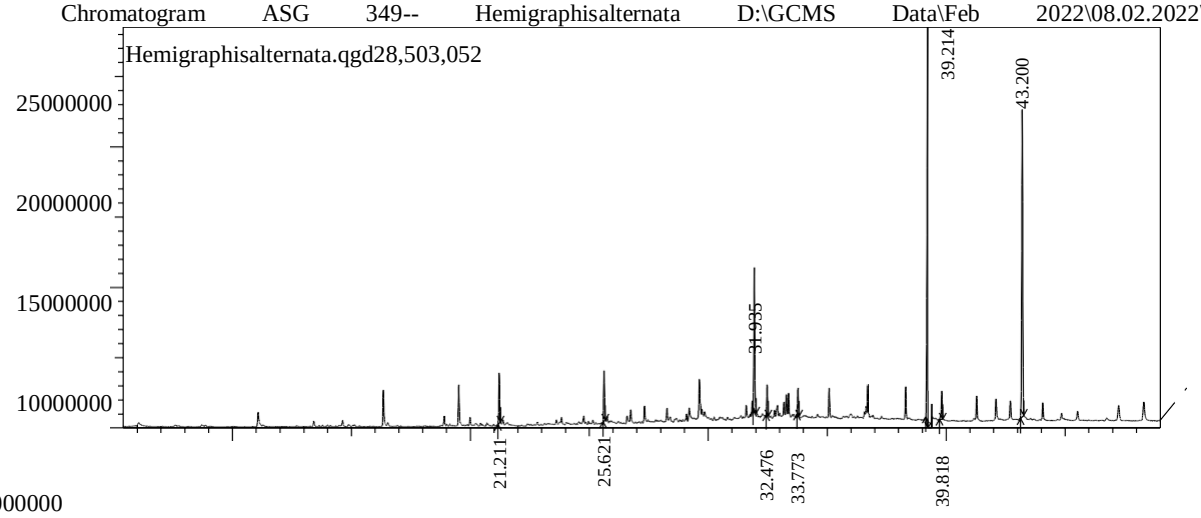
TABLE 1 PEAK REPORT

Peak#	R.Time	Area	Area %	Height	Height %	Name	Base m/z
1	21.211	9178330	5.09	3602909	4.88	1-HEXADECENE	55.05
2	25.621	9032743	5.01	3610965	4.89	E-15-Heptadecenal	55.05
3	31.935	27478353	15.25	10236337	13.87	Phytol	71.10
4	32.476	5626638	3.12	2180814	2.96	PALMITALDEHYDE, DIALLYL ACETAL	84.10
5	33.773	4683546	2.60	1930303	2.62	Phytol, acetate	68.10
6	39.214	52138356	28.93	28336119	38.40	1,2-BENZENEDICARBOXYLIC ACID	149.05
7	39.818	6035004	3.35	2016713	2.73	OCTACOSANE	57.10
8	43.200	66056858	36.65	21873853	29.64	Squalene	69.10

TABLE 2: COMPOUND PRESENT IN THE ETHYLACETATE EXTRACT OF *H. alternata* USING GC-MS ANALYSIS

SL.NO	Name of the compound	Molecular formula	Molecular weight	Biological activity
1	1-Hexadecene	$C_{16}H_{32}$	226.41_g	Antimicrobial activity, Antidiabetic activity, Antioxidant activity ,Antifungal activity
2	E-15-Heptadecenal	$C_{17}H_{320}$	252.43538_g	Antiinflammatory, Antibacterial , Antifungal, Anticancer, Antioxidant.
3	Phytol	$C_{20}H_{40}O$	296.5	Antidiabetic activity, Antiinflamatory, Antioxidant, Antiallergic , Antinoceptive activity
4	Palmitaldehyde, Diallylacetal	$C_{22}H_{42}O_2$	338.6	Antimicrobial , Photopolumerisation
5	1,2-Benzenedicarboxylic acid	$C_8H_5N_aO_4$	188.11	Antimicrobial activity
6	Octacosane			Antimicrobial activity, Antiinflamatory activity, Antitumor
7	Squalene	C_3OH_{50}	410.73_g	Antidiabtic activity, Antitumor activity, Antioxidant, Emolient

Chromatogram ASG 349-- Hemigraphisalternata D:\GCMS Data\Feb 2022\08.02.2022\ASG 349--



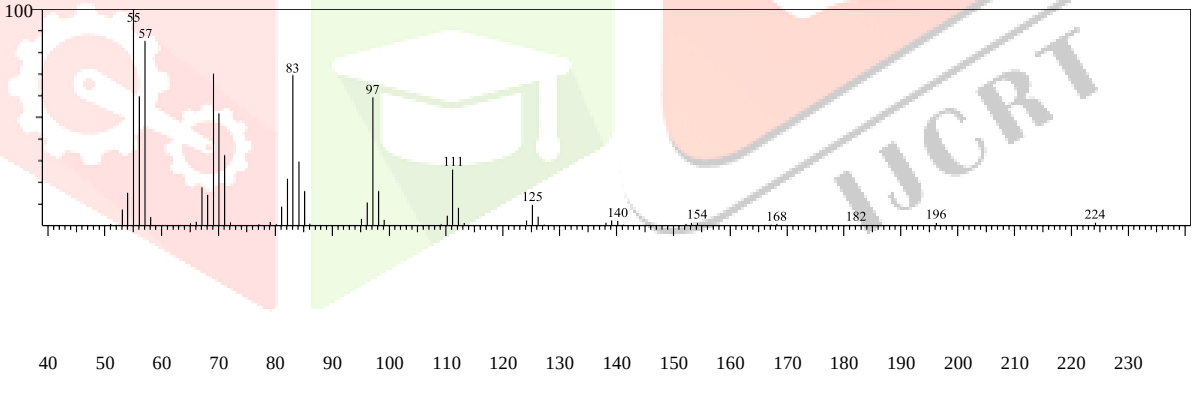
GC MS SPECTRUMS

Line#:1 R.Time:21.208(Scan#:1898)

MassPeaks:80

RawMode:Averaged21.200-21.217(1897-1899)

BasePeak:55(421358) BG Mode:Calc. from Peak Group 1 - Event 1

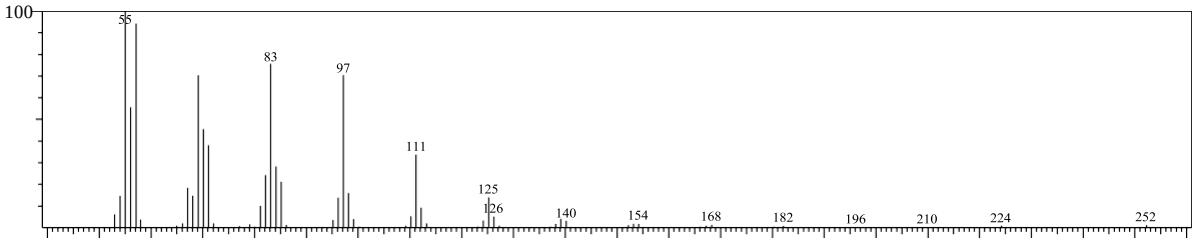


Line#:2 R.Time:25.617(Scan#:2427)

MassPeaks:92

RawMode:Averaged25.608-25.625(2426-2428) BasePeak:55(391885) BG

Mode:Calc. from Peak Group 1 - Event 1

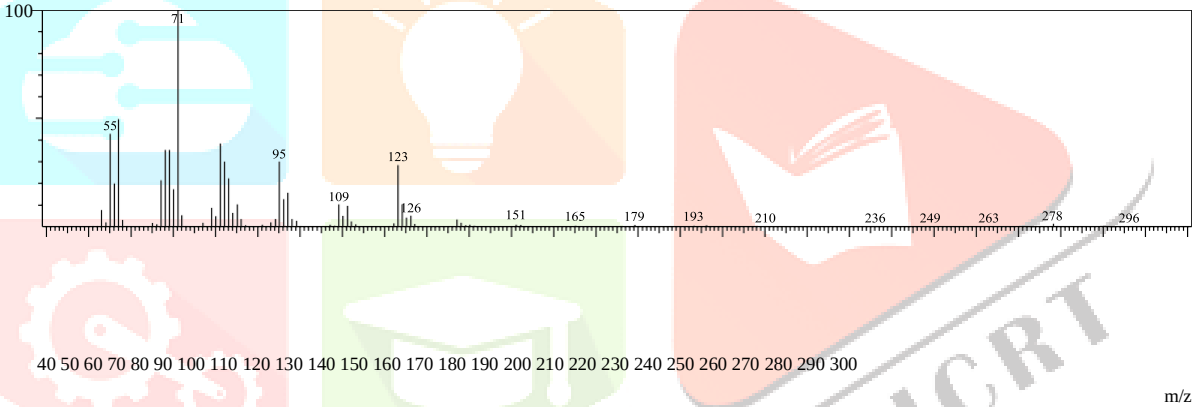


Line#:3 R.Time:31.933(Scan#:3185)

MassPeaks:147

RawMode:Averaged31.925-31.942(3184-3186) BasePeak:71(1459006) BG

Mode:Calc. from Peak Group 1 - Event 1

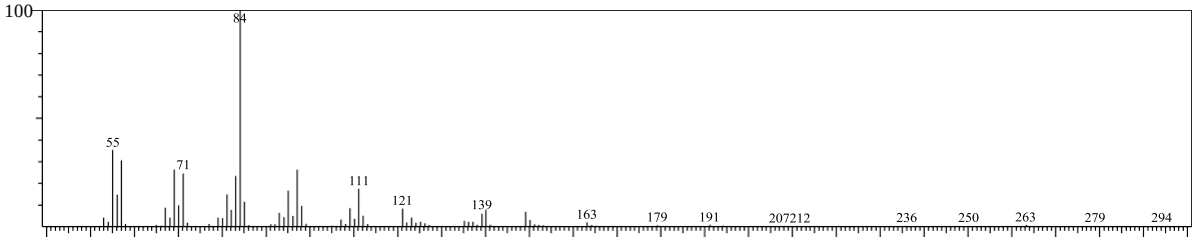


Line#:4 R.Time:32.475(Scan#:3250)

MassPeaks:138

RawMode:Averaged32.467-32.483(3249-3251) BasePeak:84(391989) BG

Mode:Calc. from Peak Group 1 - Event 1

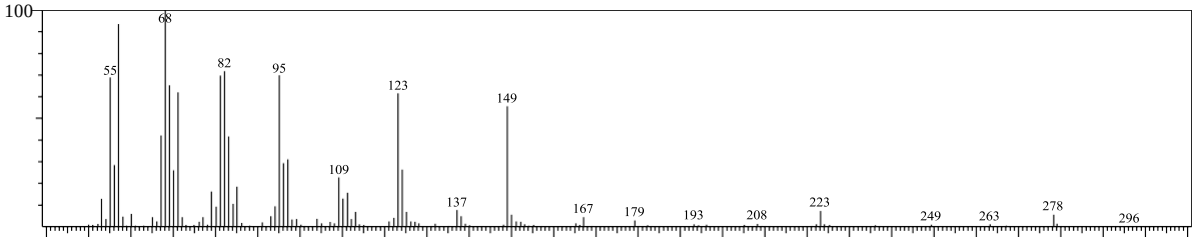


Line#:5 R.Time:33.775(Scan#:3406)

MassPeaks:133

RawMode:Averaged33.767-33.783(3405-3407) BasePeak:68(139535) BG

Mode:Calc. from Peak Group 1 - Event 1

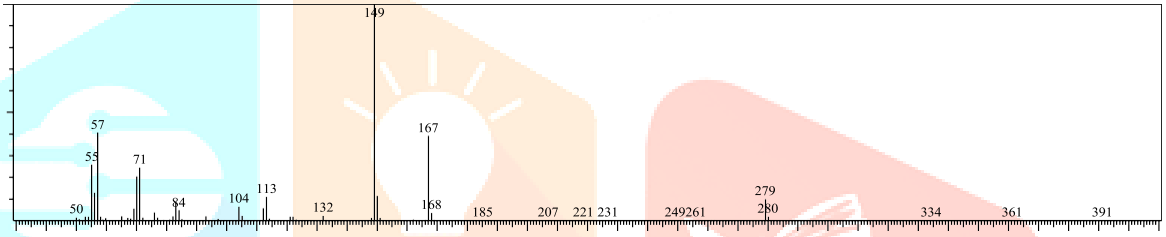


40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

m/z

RawMode:Averaged 39.208-39.225(4058-4060) BasePeak:149(4729611)

BG Mode:Calc. from Peak Group 1 - Event 1 100



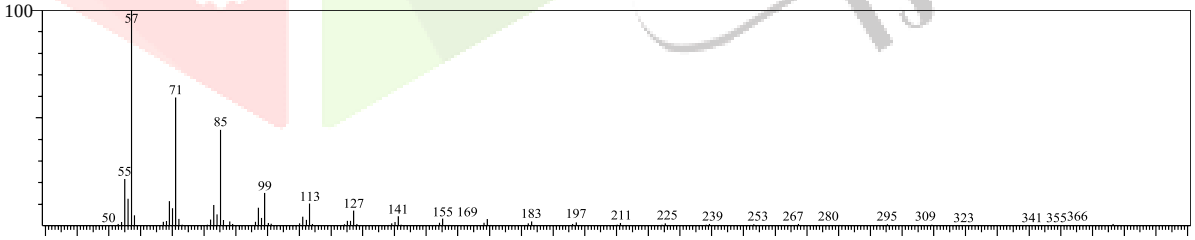
30 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 370 39m/z

Line#:7 R.Time:39.817(Scan#:4131)

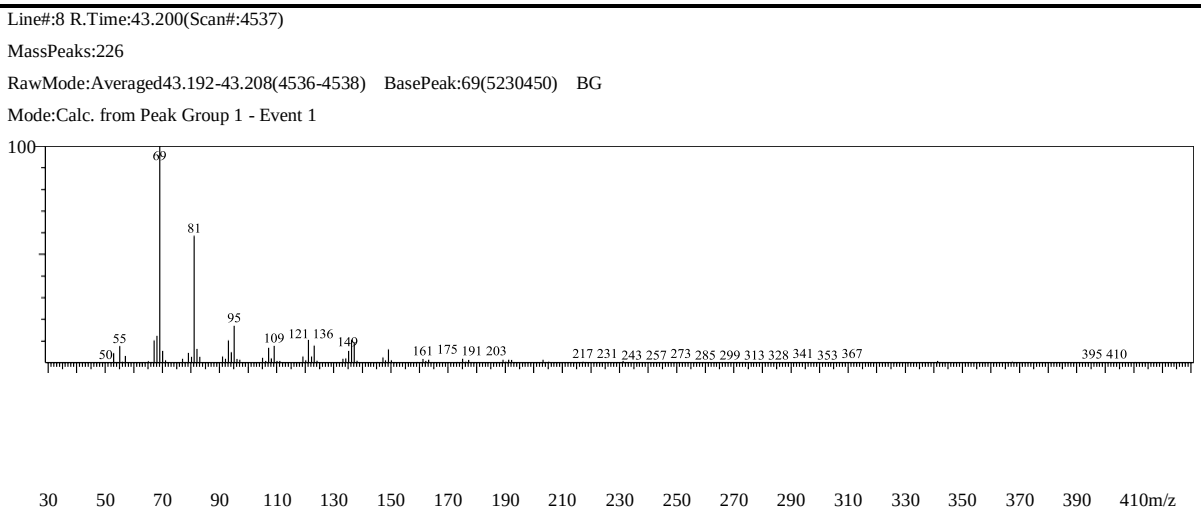
MassPeaks:138

RawMode:Averaged39.808-39.825(4130-4132) BasePeak:57(427138) BG

Mode:Calc. from Peak Group 1 - Event 1



30 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 370m/z



CONCLUSION

In conclusion the study has revealed the presence of important separatable phytochemicals such as 1-hexadecene, e-15-heptadecenal, palmitaldihyde, diallyl acetal, phytol, acetate, 1,2-benzenecarboxylic acid, octacosane, squalene by GC-MS analysis in the leaves of H. *alternata* showing potent antidiabetic activity and antiinflammatory activity. This may help in future studies to develop unexplored medications of H. *alternata.*

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