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GC-MS ANALYSIS OF THE DESERT PLANTS OF APOCYNACEAE FAMILY: *NERIUM OLEANDER* L. AND *THEVETIA PERUVIANA* (PERS.) SCHUM.

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ABSTRACT

The aim of the present study was to investigate the essential chemicals of both the plants *Nerium oleander* L. and *Thevetia peruviana* (Pers.) Schum. All the samples were dried firstly at 60°C for 2 days in an oven after that leave it on room temperature. They were then macerated to powder form with a mixer grinder. The powder was stored in air sealed polythene bags at room temperature before extraction. In methanol plant extract of *Nerium oleander* highest peak area (%) of 17.05 was obtained by 2-Nonanol, (Retention-time 18.875) and the lowest peak area (%) of 0.59 was obtained by 2-(2,2,3-trimethylcyclopent-3-en-1-yl) (Retention-time 17.925) . Whereas, in another one plant *T. peruviana* the highest peak area (%) of 48.83 was obtained by Di isopropyl ether (Retention-time 12.629) and the lowest peak area (%) of 0.10 was obtained by Trichloromethane i.e chloroform (Retention-time 18.105) in methanolic plant extract.

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Key Words

Nerium oleander, *Thevetia peruviana*, methanolic, macerated, retention time.

INTRODUCTION

During the twentieth century, when exploring the natural environment, man has made great discoveries that have enabled him to use a considerable number of natural resources¹. Medicinal plants have their values in the substances present in various plant tissues with specific physiological action in human body. Many of the plant species that provide medicinal herbs have been scientifically evaluated for their possible medicinal applications. India is endowed with a rich wealth of medicinal plants. India recognizes more than 2500 plant species which have medicinal values². Plants are like natural laboratories where a great number of chemicals are biosynthesized and in fact they may be considered the most important source of chemical compounds.

Phytotherapy, the use of plants to medical purposes, is one of the oldest practices in the world. The traditional practice, based on empirical data, is considered as folk medicine and the approach based on scientific studies aims to extract and study active components from plants.

Medicinal plants or their derived material, have been widely employed in all cultures, throughout history, for the prevention and treatment of diseases. The significant increase in the use of herbal medicines in recent decades may be attributed to popular wisdom, the costs of synthetic drugs and the resurgence of interest in the development of new drugs and the re-establishment of old ones from plant sources³.

There are innumerable potentially useful medicinal plants and herbs waiting to be evaluated and exploited for their effective therapeutic application. Both the plants with medicinal values is *Nerium oleander* L. *Thevetia peruviana* (Pers.) Schum. (Family: Apocynaceae) both are widely used for the treatment of various ailments. *Nerium oleander* L. is a beautiful free flowering shrub bearing different colors of flowers specially suited to sunny and dries localities⁴. The flower, leaves, leaf juices, latex, bark and root have been used against corn, warts, cancerous ulcer, carcinoma, ulcerating or hard tumors⁵. Whereas in *Thevetia peruviana* (Pers.) Schum. the seeds contain glycosides of neriifolin, acetyl neriifolin and thevetin. Seed oil distillate of *Thevetia peruviana* has been found

to contain anti-bacterial activity. The leaves of *Thevetia peruviana* are used to toothache due to caries. It is used in anti- rheumatic and decongestant. Its branches are used for febrifuge and purge⁶. Leaves are emetic and purgative. Bark is bitter, used as cathartic, febrifuge, useful in different kinds of intermittent fevers. The action of decoction of bark is strong in fevers; it is fifteen times stronger than bark of cinchona Flavonol glycoside from leaves of *Thevetia peruviana* has inhibitory effect against HIV-1 Reverse Transcriptase and HIV-1 Integrase⁷.

The aim of the present study is to identify the biochemical compounds of both *Nerium oleander* L and *Thevetia peruviana* (Pers.) Schum. subjecting the methanol extract of the different plant parts to Gas chromatography – Mass Spectrum analysis.

COLLECTION OF PLANT MATERIAL

Plants of *N.oleander* and *T. peruviana* were collected from the campus of Department of Botany, University of Rajasthan, Jaipur respectively. Specimens were compared with the voucher specimens at Herbarium of Department of Botany, University of Rajasthan, Jaipur.

PREPARATION OF PLANT MATERIAL

The fresh plant materials of both the plants *N.oleander* and *T. peruviana* were collected and washed individually under running tap water to remove soil particles and other dirt. All the samples were dried firstly at 60°C for 2 days in an oven after that leave it on room temperature. They were then macerated to powder form with a mixer grinder. The powder was stored in air sealed polythene bags at room temperature before extraction.

PREPARATION OF SAMPLE FOR GC/MS STUDY

About 20 grams of the each plant part powdered were soaked in 100 ml methanol individually. It was left for 24 hours so that alkaloids, flavonoid, terpenoids and other constituents if present will get dissolved. The methanol extract was filtered using Whatman No.1 filter paper and the residue was removed. It was again filtered through sodium sulphate in order to remove the traces of moisture.

GAS CHROMATOGRAPHY – MASS SPECTRUM ANALYSIS

GC-MS analysis was carried out on a GC Clarus 500 Perkin Elmer system comprising a AOC-20i auto sampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions: Column Elite-1 fused silica capillary column (30mm×0.25mm ID ×1 μ M df, 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 μ l was employed (split ratio of 10:1) injector temperature 250 °C; ion-source temperature 280 °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 0.5seconds and fragments from 45 to 450 Da. Total GC running time is 36min. Interpretation on mass spectrum of GC-MS was done using the database of National Institute Standard and Technology (NIST), WILEY275, NIST05 and ADAMS libraries, as well as authentic compounds for major identified compounds^{8,9}. 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.

RESULTS AND OBSERVATION

Gas Chromatography and Mass spectroscopy analysis of compounds were carried out in methanolic extract of *N.oleander* and *T.peruviana* respectively, shown in Table -1 and 2 In the present investigation a variety of compounds have been detected in both plant species including p-anisaldehyde (flavouring compound), Butabarbital, (alkaloids), Valencene (aromatic compound), Heneicosane, Perillene, Diosgenin (steroid and glycoside), Octacosane (aliphatic hydrocarbon), Trichloromethane (organic compound).

In methanol plant extract of *Nerium oleander* highest peak area (%) of 17.05 was obtained by 2-Nonanol, (Retention-time 18.875) and the lowest peak area (%) of 0.59 was obtained by 2-(2,2,3-trimethylcyclopent-3-en-1-yl) (Retention-time 17.925) (Table-1; Fig.1).

Whereas, in another one plant *T. peruviana* the highest peak area (%) of 48.83 was obtained by Di isopropyl ether (Retention-time 12.629) and the lowest peak area (%) of 0.10 was obtained by Trichloromethane i.e chloroform (Retention-time 18.105) in methanolic plant extract (Table-2; Fig.2).

The detailed tabulation of the GC-MS analysis of the above both plant species has been given in Table-1 and 2. The Total Ion Chromatograph (TIC) showing the peak identities of the compounds identified have been in the both plant species given in Figure 1 and 2.

SAMPLE INFORMATION

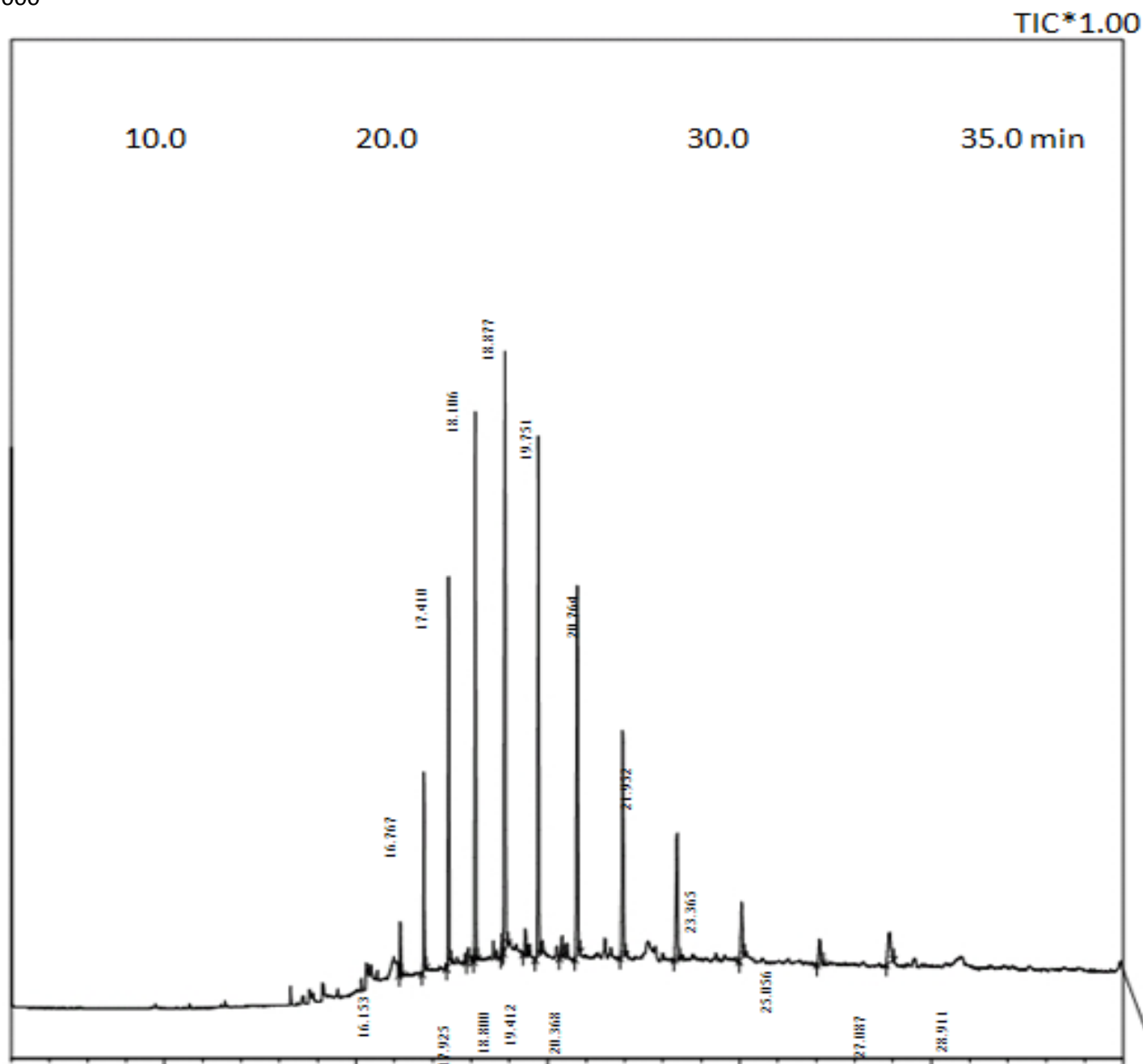
Figure 1. GC-MS Chromatogram of methanolic extract of the whole plant of *Nerium oleander*
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Table 1: Phytocomponents identified in the methanolic extracts of the whole plant of *Nerium oleander* by GC-MS Peak Report TIC

Peak #	R.Time	Area	Area%	Name/Chemical formula	IUPAC Name	Nature
1	16.153	172071	1.20	Heneicosane C ₂₁ H ₄₄	n-Heneicosane	white waxy solid, Combustible. Incompatible with strong oxidizing agents.
2	16.767	659981	4.59	Perillene C ₁₀ H ₁₄ O	3-(4-methyl-3-pentenyl) furan	Polycyclic aromatic hydrocarbon colorless clear liquid
3	17.410	1401289	9.75	Octyl acetate C ₁₀ H ₁₆ O	Octyl acetate	artificial orange flavoring, nitrocellulose, waxes, oils and some resins.
4	17.925	84818	0.59	α-campholenal C ₁₀ H ₁₆ O	2- (2,2,3-trimethylcyclopent-3-en-1-yl)	Insoluble, clear colorless to pale yellowish liquid
5	18.106	2089377	14.54	Trichloroethylene C ₂ HCl ₃	1,1,2-trichloroethene	<u>chlorinated hydrocarbon</u> , volatile <u>anesthetic</u> and analgesic
6	18.800	87306	0.61	Cyclohexyl Alcohol C ₆ H ₁₂ O	Cyclohexanol	<u>deliquescent</u> colorless solid, Colorless, viscous liquid. <u>Hygroscopic</u>
7	18.875	2450115	17.05	2-Nonanol C ₉ H ₂₀ O	nonan-2-ol	flavor and fragrance agents
8	19.412	112091	0.78	Endosulfan II C ₉ H ₆ Cl ₆ O ₃ S	6,9-Methano-2,4,3-benzodioxathiepin	<u>organochlorine insecticide</u> and <u>acaricide</u>
9	19.751	2297778	15.99	Ethylbenzol C ₈ H ₁₀	Ethylbenzene	<u>aromatic hydrocarbon</u> , <u>organic compound</u>
10	20.368	118798	0.83	Octacosane C ₂₈ H ₅₈	Octacosane	<u>aliphatic hydrocarbon</u>
11	20.764	1839494	12.80	Eicosane C ₂₀ H ₄₂	N-eicosane	cosmetic and fragrance agents, Colorless crystals or wax-like solid
12	21.952	1266173	8.81	Hexacosane C ₂₆ H ₅₄	Hexacosane	Strong oxidizing agents , colourless
13	23.365	814382	5.67	C ₄₄ H ₉₀ Tetratetracontane	Tetratetracontane	<u>hydrocarbons</u> , alcohol-resistant, dry chemical, light yellow

14	25.056	408796	2.85	Italicene $C_{15}H_{24}O$	Italicene	tricyclic sesquiterpene hydrocarbon
15	27.087	217802	1.52	Tetratriacontane $C_{33}H_{68}$	n-tritriacontane	Insoluble in water, flakes white
16	28.911	348425	2.42	Diosgenin $C_{27}H_{42}O_3$	(3 β ,25R)-spirost- 5-en-3-ol	steroid and glycosides
		1436869 6	100.00			

SAMPLE INFORMATION

Figure.2 GC-MS Chromatogram of methanolic extract of the whole plant of *Thevetia peruviana*

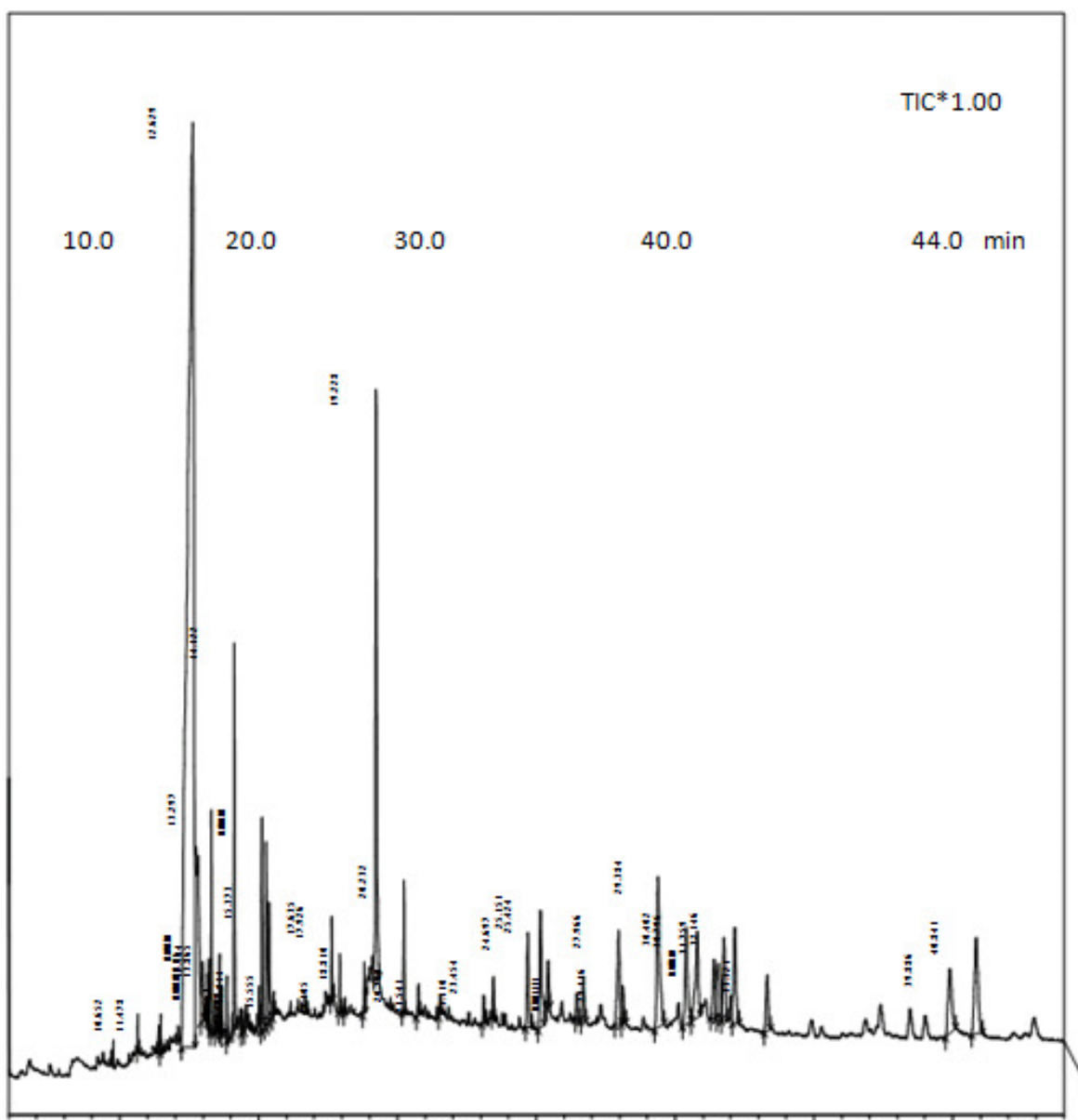


Table 2: Phytocomponents identified in the methanolic extracts of the whole plant of *Thevetia peruviana* by GC-MS Peak Report TIC

Peak#	R.Time	Area	Area%	Name/Chemical formula	IUPAC Name	Nature
1	10.652	208177	0.19	α -phellandrene C ₁₀ H ₁₆	2-Methyl-5-(1-methylethyl)-1,3-cyclohexadiene	pleasing aromas, peppery-minty and slightly citrus.
2	11.478	241309	0.22	p-anisaldehyde C ₈ H ₈ O ₂	4-Methoxybenzaldehyde	Aromatic, perfumes and flavouring compounds
3	12.629	53878240	48.83	Di isopropylether C ₆ H ₁₄ O	(2,2'-oxybispropane)	Strong oxidizers, acids
4	12.984	788130	0.71	1,1-dichloropropene C ₃ H ₄ Cl ₂	1,1-dichloroprop-1-ene	colorless liquid with sweet smell
5	13.157	235818	0.21	Valencene C ₁₅ H ₂₄	((2R)-8,8,8a-trimethyl-2-prop-1-en-2-yl-1,2,3,4,6,7-hexahydronaphthalene	aroma component of citrus fruit and citrus-derived odorants
6	13.211	384294	0.35	γ -Terpinene C ₁₀ H ₁₆	1-methyl-4-propan-2-ylcyclohexa-1,4-diene	flavor and fragrance for the reconstitution and extension of citrus oils
7	13.297	1942571	1.76	bis(2-chloroethyl) ether C ₄ H ₈ Cl ₂	1,1'-Oxybis(2-chloro)ethane	solvent, colorless nonflammable liquid strong unpleasant odor
8	13.469	395247	0.36	2-chlorophenol C ₆ H ₅ ClO	2-Hydroxychlorobenzene	pesticides, herbicides, and disinfectants.
9	13.599	558887	0.51	Neophytadiene <u>C₂₀H₃₈</u>	(7E,13E)-icos-7,13-diene	Colorless Liquid
10	13.675	348417	0.32	Pentatriacontane C ₃₅ H ₇₂	n-Pentatriacontane	Natural substances and extractives, <u>Volatile Compounds in food</u>
11	13.865	364838	0.33	PDB C ₆ H ₄ Cl ₂	1,4-dichlorobenzene	Disinfectant, deodorant, and pesticide

12	14.122	3038408	2.75	Ethyl ester C ₄ H ₈ O ₂	Ethylacetate	Volatile <u>solvent and diluent</u>
13	14.409	243830	0.22	Cuminaldehyde C ₁₀ H ₁₂ O	4-(1-Methylethyl)benzaldehyde	Organic compound, pleasant smell
14	14.553	367657	0.33	Perillaldehyde C ₁₀ H ₁₄ O	(S)-4-(1-Methylethenyl)-1-cyclohexene-1-carboxaldehyde	Perfumery, sweetener
15	15.014	260251	0.24	A-thujone C ₁₀ H ₁₆ O	α: (1S,4R,5R)-4-Methyl-1-(propan-2-yl)bicyclo[3.1.0]hexan-3-one	toxic agent
16	15.120	1663589	1.51	Crotoxyphos C ₁₄ H ₁₉ O ₆ P	Dimethyl phosphate of alpha-methylbenzyl 3-hydroxy-cis-crotonate	<u>Insecticide</u>
17	15.268	2421132	2.19	3,5-dichlorobenzoic Acid C ₇ H ₄ Cl ₂ O	3,5-dichlorobenzoic Acid	yellow crystalline solid yellow crystalline solid
18	15.373	1406647	1.27	Aminic acid CH ₂ O ₂	Formic acid	colorless liquid, pungent, penetrating odor
19	15.555	274690	0.25	Heneicosane C ₂₁ H ₄₄	n- Heneicosane	white waxy solid Combustible. Incompatible with strong oxidizing agents.
20	17.635	664936	0.60	Chloroacetonitrile C ₂ H ₂ ClN	2-Chloroacetonitrile	Disinfection, Colorless transparent liquid
21	17.926	382435	0.35	Nonadecane C ₁₉ H ₄₀	n- Nonadecane	fragrance agents, Insoluble in water
22	18.105	106413	0.10	Trichloromethane CHCl ₃	Chloroform	Organic compound, colorless, sweet-smelling
23	18.810	448105	0.41	Trichloropropane C ₃ H ₅ Cl ₃	1,2,3-trichloropropane	colorless or straw yellow transparent liquid
24	19.228	6315095	5.72	methyl caprylate C ₉ H ₁₈ O ₂	methyl octanoate	oily, colorless liquid
25	20.232	1119836	1.01	2-(2-butoxyethoxy)	2(2-butoxyethoxy)	colourless liquid with a mild odour

				ethanol	ethanol	
26	20.760	365036	0.33	1-Methyl-2-chlorobenzene C ₇ H ₇ Cl	2, chlorotoluene	slightly soluble, toxic
27	21.541	159499	0.14	Tetramethylene dichloride C ₄ H ₈ Cl ₂	1,4-dichlorobutane	Flammable. Incompatible with strong bases, strong oxidizing agents.
28	23.110	319425	0.29	2-chloroethyl alcohol C ₂ H ₅ ClO	2-chloroethanol	colorless liquid, Incompatible with oxidizing agents
29	23.454	506412	0.46	Butabarbital C ₁₀ H ₁₆ N ₂ O ₃	5-butan-2-yl-5-ethyl-1,3-diazinane-2,4,6-trione	Alkaloids,
30	24.697	1575669	1.43	Butalbital C ₁₁ H ₁₆ N ₂ O ₃	5-(2-methylpropyl)-5-(2-propenyl)-2,4,6(1H,3H,5H)-pyrimidinetrione	slightly bitter, white, odourless
31	25.151	2225113	2.02	α-methylbenzylalcohol C ₈ H ₉ F	4-Fluoro- α -methylbenzyl alcohol	liquid colourless, Strong oxidizing agen
32	25.424	689763	0.63	Amobarbital C ₁₁ H ₁₈ N ₂ O ₃	5-ethyl-5-(3-methylbutyl)-1,3-diazinane-2,4,6-trione	Sedative, Hypnotic,
33	26.461	430721	0.39	Di ethylene glycol C ₄ H ₁₀ O ₃	tetraethyleneglycol	transparent, colorless, practically odorless, low-volatility, moderate-viscosity, hygroscopic liquid
34	26.695	682232	0.62	Decahydro-4,8,8-trimethyl-1,4-methanoazulene-9-carbaldehyde C ₁₅ H ₂₄ O	Longifolenaldehyde	Colorless to yellow liquid, Penetrating, sickening. Solubility
35	27.966	2175737	1.97	parathion C ₁₀ H ₁₄ NO ₅ PS	O,O-Diethyl O-(4-nitrophenyl) phosphorothioate	White crystals, organophosphate compound

36	28.116	666948	0.60	prometryn C ₁₀ H ₁₉ N ₅ S	N ² ,N ⁴ - diisopropyl-6- methylthio- 1,3,5-triazine- 2,4-diamine	white odorless or very faint, <u>Herbicide</u>
37	29.384	3861632	3.50	<u>diphenhydramin</u> e C ₁₇ H ₂₁ NO	dimenhydrinate	<u>hypnotic, anxiolytic</u>
38	30.402	2252678	2.04	Phenylethane C ₈ H ₁₀	Ethylbenzene	Clear, colorless liquid, <u>aromatic hydrocarbon</u>
39	30.796	2414099	2.19	Methadone C ₂₁ H ₂₇ NO	(RS)-6- (Dimethylamino) -4,4- diphenylheptan- 3-one	<i>Antitussive, Analgesic</i>
40	31.409	1404821	1.27	Tetrachlorvinpho s C ₁₀ H ₉ Cl ₄ O ₄ P	(Z)-2-chloro-1- (2,4,5- trichlorophenyl) vinyl dimethyl phosphate	<u>organophosphate acaricides and insecticides</u>
41	31.564	1711739	1.55	Chlorpyrifos C ₉ H ₁₁ Cl ₃ NO ₃ PS	O,O-Diethyl O- 3,5,6- trichloropyridin- 2-yl phosphorothioat e	colourless crystals, <u>organophosphate insecticide</u>
42	31.759	1861050	1.69	Malathion C ₁₀ H ₁₉ O ₆ PS ₂	Diethyl 2- [(dimethoxyphos phorothioyl)sulf anyl]butanedioa te	Clear colorless liquid, Soluble in ethanol and acetone; very soluble in ethyl ether
43	32.146	2180140	1.98	1,2- Dimethylbenzene C ₈ H ₁₀	o-xylene	Colorless liquid, <u>aromatic hydrocarbon</u> , Aromatic. Sweetish
44	33.321	1188299	1.08	Promazine C ₁₇ H ₂₀ N ₂ S	N,N-dimethyl-3- (10H- phenothiazin-10- yl)-propan-1- amine	<u>anticholinergic</u>

45	39.886	2289477	2.08	Brompheniramine $C_{16}H_{19}BrN_2$	3-(4-bromophenyl)-N,N-dimethyl-3-pyridin-2-ylpropan-1-amine	<u>antagonist, antimuscarinic</u>
46	40.841	3314336	3.00	Scopolamine $C_{17}H_{21}NO_4$	(-)-(S)-3-hydroxy-2-phenylpropionic acid(1R,2R,4S,7S,9S)-9-methyl-3-oxa-9-azatricyclo[3.3.1.0 ^{2,4}]non-7-yl ester	<u>Tropane alkaloid drug</u>
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DISCUSSION

Plants have formed the basis for traditional medicinal systems for thousands of years, with the first records dating from about 2600 BC in Mesopotamia. Traditional knowledge of medicinal plants has always guided the search for new cures. In spite of the advent of modern high throughput drug discovery and screening techniques, traditional knowledge systems have given clues to the discovery of valuable drugs¹⁰.

In the present study, methanolic extract of the plant of the *N.oleander* and *T. peruviana* samples were analyzed for the first time. The comparison of the mass spectrum with the NIST database library gave more than 90% match as well as a confirmatory compound structure match. This work will help to identify the compounds, which may be used in body products, drugs, pharmaceutical and therapeutic value

Based on the present account of biochemical compounds in the whole plant of the above both plant species we bring to a close that it may be used for medical purposes. This acquaintance can be used for the further development of phytomedicines from the both plant species. Volatile organic materials are products of the secondary metabolism of plants, and are generally consisting of complex mixtures of mono-, sesqui-, di-, tri-terpene hydrocarbons, and oxygenated materials biogenically derived from them¹¹.

The plant has long being investigated for its phytochemicals and pharmacological activities supporting its vast ethnobotanical and alternative medicinal use. Traditional use of this plant has been validated by several pharmacological investigations. The plant has been reported extensively as anticancerous, antimicrobial, molluscicidal, anxiolytic and antipsychotic agent¹². Both the plant *N.oleander* and *T. peruviana* have immense medicinal properties and is used for various ailments. The use of herbal preparations for therapeutic remedies is as old as man himself. Several remedial properties have been attributed from this plant *N.oleander* like anti bacterial activity¹³ as an abortifacient¹⁴. In Iran the dried leaf extract has been used as a cardiotoxic and diuretic in oedema¹⁵. It is also used as a folklore medicine¹⁶. The plant has been used for its tumor promoting activity¹⁷ and has also been used for its antibacterial activity¹⁸. Where as, in *T. peruviana* seeds are used as purgative in dropsy and rheumatism. Kernel is acro-narcotic poison. Milky juice is highly poisonous and is used for suicide. Flavonol glycoside from leaves of *Thevetia peruviana* has inhibitory effect against HIV-1 Reverse Transcriptase and HIV-1 Integrase⁷. The cardiac glycosides peruvoside from yellow oleander is used medicinally for treatment of cardiac insufficient¹⁴.

The plant has long been investigated for its phytochemicals and pharmacological activities supporting its vast ethno botanical and alternative medicinal use. Traditional use of this plant has been validated by several pharmacological investigations.

The presence of fatty acids and aromatics in *N.oleander* and *T.peruviana* shows the pharmacological properties of the plant. The studies on the active principles content in *N.oleander* and *T.peruviana* by GC/MS clearly shows the highest presence of saturated and unsaturated fatty acids like, tetradecanoic acid, oleic acid, heptadecanoic acid, octadecanoic acid (stearic acid) and n-Hexadecanoic acid were found in all the plant parts of both plant species.

Heneicosane, is an unsaturated fatty acids is white waxy solid and is combustible. Perillene is a polycyclic aromatic hydrocarbon, colorless clear liquid. α -campholenal insoluble, clear colorless to pale yellowish liquid. 2-Nonanol is a flavor and fragrance agents, Octacosane is an aliphatic hydrocarbon where as diosgenin is a steroid and glycosides, α -phellandrene is a compound of pleasing aromas, peppery-minty and slightly citrus however, p-anisaldehyde is a aromatic compound, perfumes and flavouring compounds. γ -Terpinene is a flavor and fragrance for the reconstitution and extension of citrus oils. Ethyl ester is a volatile solvent and diluent where as, Butabarbital is an alkaloids present in both the plants.

Similarly the presence of these compounds was reported in *Euphoria longan*¹⁹ *Thymus serphyllum*²⁰, *Canthium dicocum* (Gaertn.) Teijsm & Binn²¹, *A. galangal*²² *Chrysanthemum indicum*²³, *Mentha rotundifolia*²⁴, *Rosmarinus officinalis* and *Juniperus Phoenicea*²⁵.

The assessment of the mass spectrum with the NIST database library gave more than 90% match as well as a assenting compound structure match. This work will help to identify the compounds, which may be used in body products, drugs, pharmaceutical and healing value. The present study has been found useful in the identification of several constituents present in the methanolic extract of the plants. The presence of various bioactive compounds (identified as sesquiterpenoids, aldehydes, alcohols, terpinolene)

justifies the use of the whole plant for various ailments by traditional practitioners.

Based on the present account of biochemical compounds in the different plant of the above both plant species. We conclude that it may be used for therapeutic purposes. This awareness can be used for the further development of phytomedicines from the both plant species. Through this method, compiled with other techniques, we hope to isolate and identify unknown peaks. We plan to obtain standards of several of the identified constituents, especially those with indicated medicinal purposes, to verify their location in the observed spectra.

REFERENCES

1. D., Takhi, M. Quinten and M., Yousfi (2011) Study of Antimicrobial Activity of Secondary Metabolites Extracted From spontaneous Plants from the Area of Laghouat, Algeria. *Advances in Environmental Biology*, 5(2): 469-476
2. Kirtikar KR, Basu BD (1995). *Indian Medicinal Plants*. Vol.1, International book distributors, Deharadun, India, pp.830-832.
3. Marili V.N. Rodrigues, Felix G. R. Reyes, Pedro M. Magalhães and Susanne Rath (2007). GC-MS Determination of Organochlorine Pesticides in Medicinal Plants Harvested in Brazil. *J. Braz. Chem. Soc.*, Vol. 18, No. 1, 135-142.
4. Lokesh R, Leonard Banbaras, Madhuri P, Saurav K, Sundar K (2010). Larvicidal activity *Trigonella foenum* and *Nerium oleander*. *Current research journal of biological sciences*; 2(3): 154-160.
5. Shanthi R, Lakshmi G, Priyadarshini A. M, Anandaraj L (2011). Phytochemical screening of *Nerium oleander* leaves and *Momordica charantia* leaves. *International research journal of pharmacy* 2(1) 131-135.
6. R. Thilagavathi, Helen P. Kavitha and B. R. Venkatraman (2010) Isolation, Characterization and Anti-Inflammatory Property of *Thevetia*

- Peruviana* ISSN: 0973-4945; Coden Ecjhao E-Journal of Chemistry <http://www.e-journals.net> 2010, 7(4), 1584-1590.
7. Tewtrakul, S., Nakamura, N., Hattori, M., Fujiwara, T. and Supavita, T. 2002. Flavanone and flavonol glycosides from the leaves of *Thevetia peruviana* and their HIV-1 reverse transcriptase and HIV-1 integrase inhibitory activities. *Chem. Pharm. Bull.* 50(5):630-5.
 8. Adams, R.P., 2007. Identification of Essential Oil Components by Gas Allured Publishing Corporation, IL, USA., ISBN-10: 1932633219.
 9. NIST,(2005). NIST/EPA/NIH Mass Spectral Library Software. Version 2.0, National Institute of Standards and Technology, USA.
 10. Chew, Y. L., Goh, J. K. and Lim, Y. Y. (2009). Assessment of *in vitro* antioxidant capacity and polyphenolic composition of selected medicinal herbs from Leguminosae family in Peninsular Malaysia. *Food Chemistry.* 116, 13–18.
 11. Anjali Ruikar, Rasika Torane, Amruta Tambe , Vedavati Puranik, Nirmala Deshpande (2009). GC-MS Study Of A Steam Volatile Matter From *Mimusops elengi*. *International Journal of ChemTech Research* Vol.1, No.2, pp 158-161
 12. Abhijit Dey (2011) *Alstonia scholaris* R.Br. (Apocynaceae): Phytochemistry and pharmacology: A concise review. *Journal of Applied Pharmaceutical Science* 01 (06); 2011: 51-57
 13. Sawhney AN, Khan MR, Ndaalio G, Nkunya MHH, Wevers H (1978). Studies on the Rationale of African Traditional Medicine. Part II. Preliminary Screening of Medicinal Plants for Anti-Gonococci Activity. *Pak J Sci Ind Res.*;21(5/6):189–192.
 14. Watt JM , Breyer Brandwijk MG, editors (1962). *The Medicinal and poisonous plants of Southern and Eastern Africa*. 2nd ed. London: E. +S. Livingston, Ltd.
 15. Zargari A (1995). *Medicinal Planta*. 5th Ed. Vol. 3. Tehran, Iran: Tehran University Publications; p. 889. No: 1810/3.
 16. Carbajal D, Casaco A, Arruzazabala L, Gonzalez R, Fuentes V (1991). Pharmacological Screening of Plant Decoctions Commonly used in Cuban Folk Medicine. *J Ethanopharmacol.* 33:21–24.
 17. Ilham M, Yaday M, Norhanom AW (1995). Tumour Promoting Activity of Plants used in Malaysian Traditional Medicine. *Nat Prod Sci.*:31–42.
 18. Srinivasan D, Nathan S, Suresh T, Perumalsamy PL (2001). Antimicrobial Activity of certain Indian Medicinal Plants used in Folkloric Medicine. *J EthanoPharmacol.*;74: 217–220.
 19. P Devi , M Nagarajan , AJM Christina , R. Meera1, N.J.Merlin (2009). GC –MS ANALYSIS OF *EUPHORIA LONGAN* LEAVES. *International Journal of Pharma Research and Development* Vol 1:p: 1-4. ISSN 0974 – 9446
 20. Adeela Mushtaq Ahmad, Irshad Khokhar, Iftikhar Ahmad, Muhammad Akram Kashmiri, Ahmad Adnan, Mushtaq Ahmad (2006). Study of antimicrobial activity and composition by GC/MS spectroscopic analysis of the essential oil of *Thymus serpyllum* *Internet Journal of Food Safety*, Vol.5,, p. 56-60.
 21. Raja Rajeswari. N, RamaLakshmi. S and Muthuchelian. K (2011). GC-MS Analysis of bioactive components from the ethanolic leaf extract of *Canthium dicocum* (Gaertn.) Teijsm & Binn. *J. Chem. Pharm. Res.*, 3(3):792-798.
 22. Leopold Jirovetz, Gerhard Buchbauer, Mohamed Pottachola, Shafi,Neettiyath Kalathil Leela. (2003).Analysis of the essential oils of the leaves, stems, rhizomes and roots of the medicinal plant *Alpinia galanga* from southern India *Acta Pharm.* 53 (2003) 73–81.
 23. Liang-Yu Wu, Hong-Zhou Gao, Xun-Lei Wang, Jian-Hui Ye, Jian-Liang Lu and Yue-Rong Liang (2010).

Analysis of chemical composition of *Chrysanthemum indicum* flowers by GC/MS and HPLC. Journal of Medicinal Plants Research Vol. 4(5), pp. 421-426.

24. E. Derwich, Z. Benziane, A. Boukir and L. Benaabidate (2009). GC-MS analysis of the leaf essential oil of *Mentha rotundifolia*, a traditional herbal medicine in Morocco *Chem. Bull. "POLITEHNICA" Univ. (Timisoara)* Volume 54(68), 2.
25. E. Derwich, Z. Benziane and R. Chabir (2011). Aromatic and medicinal plants of Morocco: chemical composition of essential oils of *Rosmarinus officinalis* and *Juniperus Phoenicea* Volume: 2: Issue-1pp-145-153.
