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PRELIMINARY PHYTOCHEMICAL SCREENING AND GC-MS ANALYSIS FOR IDENTIFICATION OF BIOACTIVE COMPOUNDS FROM *ABUTILON FRUTICOSUM* GUILL AND PERR. A RARE AND ENDEMIC PLANT OF INDIAN THAR DESERT

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Keywords:

Abutilon fruticosum, Beta-sitosterol, Endemic, GC-MS, Phytosterols, Terpenes

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ABSTRACT: Present work was aimed to determine, identify, and characterize the bioactive chemical compounds from methanolic leaves extract of *Abutilon fruticosum* by GC-MS analysis. Fresh disease-free leaves were collected shade dried and powdered for extraction with HPLC grade methanol. Preliminary phytochemical screening of methanolic leaves extract was performed using standard methods to determine the presence of different chemical compounds; the crude extract was subjected to GC- MS analysis for the identification of bioactive compounds. Phytochemical screening of methanolic leaves extracts revealed the presence of carbohydrates, proteins, alkaloids, phenols, flavonoids, terpenes, phytosterols, *etc*. Furthermore, GC MS analysis of the extract revealed the presence of 65 bioactive compounds. Some major biologically active compounds identified were Azulene (24.91%), Hexadecanoic acid (13.27%), Phytol (9.51%), Beta-sitosterol (3.19%), Lupeol (1.21%), Campesterol (0.33%) *etc*. These chemical compounds are biologically active and pharmacologically important. The study provides detailed information about the identification and chemical characterization of various medicinally important phytocompounds from methanolic leaves extract of this plant. Although the plant is rare and endemic to Indian Thar Desert and previously not explored very much, such kind of study about this plant could provide valuable information to be used in pharmacological research.

INTRODUCTION: The ancient medicinal system played an important role in meeting the demand at the global level. Approximately 80-90 percent of the world's population mainly depends on traditional medicine for primary healthcare; most of them involve the use of plant extracts [1]. Medicinal plants are rich in various bioactive compounds such as alkaloids, steroids, flavonoids, glycosides, terpenoids, phenols, gum, and mucilage, *etc*.

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These components are mainly responsible for the therapeutic activity of plants. To understand the bioactivity of plants, whether it is medicinal, poisonous, or nutritive knowledge of its phytoconstituents, is necessary. Thus, phyto-chemical research is very important in the development and discovery of the drug. With the increasing advancement of technology, GC-MS analysis emerged as a powerful technique for the identification and quantification of bioactive compounds from medicinal plant extract even in very minute quantity. One such an important medicinal plant is *Abutilon fruticosum* Guill. and Perr. They are commonly known as 'Imarti'. The plant is a rare and endemic medicinal plant of Indian Thar Desert region [2].

It is branched perennial undershrub with a dense slender and thin stem, acute to sub obtuse ovate to chordate leaf, velvety on both the surfaces, light yellow colored solitary flowers, and schizocarpic cylindrical fruit with 8-10 awnless mericarp [3]. It is xeriscaping plant, commonly found at small hillocks and rocky plains of the arid region of Rajasthan **Fig. 1**.

FIG. 1: *ABUTILON FRUTICOSUM* FIELD VIEW

Systemic Position: [4]

Kingdom	:	Plantae
Clade	:	Angiosperm
Clade	:	Eudicots
Clade	:	Rosids
Clade	:	Malvids
Order	:	Malvales
Family	:	Malvaceae
Genus	:	*Abutilon* Mill.
Species	:	*fruticosum* Guill. and Perr.

The plant belongs to genus *Abutilon* and its sister species such as *Abutilon indicum* reported having great medicinal utility. All parts of this plant are useful in the treatment of various diseases and ailments such as leprosy, rheumatism, piles, ulcer, jaundice, bronchitis, inflammation of bladder *etc*. [5, 6, 7]. From the critical literature survey, it was revealed that there is no previous report on phytochemical characterization of this plant. The identification of phytoconstituents through GC-MS analysis from crude methanolic leaf extract is also missing from this plant. As it is an endemic plant of the Indian Thar Desert region and due to lacking knowledge about its phytoconstituents, chemical characterization is necessary to explore the potential of the plant to be used for medicinal purposes. Increasing urbanization and overgrazing lead to habitat destruction of this endemic plant, and it has become rare in occurrence. So new cultivation techniques should be practiced to save the medicinal plant species of this region.

The present study was conducted for the identification of bioactive compounds in the leaves of *A. fruticosum* by preliminary phytochemical screening and GC-MS analysis, which could provide useful information about this plant for further studies.

MATERIALS AND METHODS:

Plant Material Collection: Fresh and disease-free leaves of the plant *A. fruticosum* were collected from rocky areas of Kailana and Mandore of Jodhpur, Rajasthan, India, during August 2018. The plant sample was identified and authenticated by BSI, Arid Zone Regional Centre (Plant authentication number- BSI/AZRC/1.12012), and the voucher specimen was deposited in the Herbarium of Department of Botany, Jai Narain Vyas University, Jodhpur (Rajasthan).

Preparation of Plant Extract: Thoroughly washed and shade dried leaves of plant material were coarsely powdered and kept in an airtight container till further use.

10 g of leaf powder was extracted with 100 ml of HPLC grade Methanol and kept in the dark for 48 h with occasional stirring. The extract was then filtered with Whatman filter paper no.1 solvent was evaporated from the filtrate till a semi-solid mass is obtained.

Phytochemical Screening: Preliminary phyto-chemical screening of leaf methanolic extract was performed to test the presence or absence of various primary and secondary metabolites such as carbohydrates, proteins, alkaloids, steroids, terpenoids, phenols, flavonoids, glycosides, *etc*. using standard methods [8, 9].

GC-MS Analysis: GC-MS analysis of crude extract was performed with GC-MS equipment QP 2010 Shimadzu, Japan. Experimental conditions for GC-MS were as follow: Helium gas as the carrier

gas at a constant flow rate of 16.3 ml/min and column flow rate 1.21ml/min. Injector and mass transfer line temp were 200 and 280 °C for 10 min. The total running time of GC-MS was 50 min. The injection volume was 1µl.

As individual compounds eluted from the GC column where these compounds were bombarded with a stream of electrons, causing them to break into fragments. Samples were run fully at a range of 50/650 m/z and mass spectrum graphs obtained, which was a fingerprint of a molecule. The identified compounds were compared with the NIST library and Willey spectral library search programme.

RESULTS: Preliminary phytochemical screening of methanolic extract of *Abutilon fruticosum* showed the presence of bioactive compounds such as carbohydrate, amino acids, phenols, terpenoids, phytosterol, tannins, glycosides, saponins, Gums and mucilage **Table 1**.

GC-MS chromatogram of methanolic extract of *Abutilon fruticosum* shows 68 peaks pertaining to presence of 65 bioactive compounds, as shown in **Fig. 2**. Major compounds were identified through mass spectrometry attached with GC as listed in **Table 2** along with their retention time, molecular formula, molecular weight, and chemical nature. Some major compounds identified with high peak area were Azulene (24.91%), n-Hexadecanoic acid (13.27%), Phytol (9.51%), Neophytadiene (2.17%),9,12-Octadecadienoic Acid, Methyl Ester (3.54%), Hexadecanoic acid methyl ester (5.05%), 9,12,15-Octadecatrienoic Acid, (Z,Z,Z) –or alpha linolenic acid (3.54%), Squalene (3.46%), Beta.-Sitosterol (3.19%), Stigmasta-5, 22- Dien- 3-Ol (1.71%), 8,11,14-Docosatrienoic acid, Methyl Ester (1.65%), Lupeol (1.21%) and other important chemical constituents with less than 1% peak area were 2-Methoxy-4vinylphenol(0.99%), Linoelaidic acid (0.85%), Alpha.-Tocospiro A (0.8%), Lup-20 (29)-En-3-One (0.64%), 1Eicosanol (0.38%), Campesterol (0.33%), Gamma. Tocopherol (0.3%).

TABLE 1: PHYTOCHEMICAL SCREENING IN METHANOLIC EXTRACT OF *ABUTILON FRUTICOSUM*

S. no.	Phytochemical Constituents	Test	Result
1	Carbohydrates	Molisch's test	+
		Fehling's test	+
2	Proteins and Amino Acids	Ninhydrin test	+
		Xanthoproteic test	+
3	Alkaloids	Dragendrof 's test	+
		Wagner's test	+
4	Phenols	Ferric chloride test	+
		Lead acetate test	+
5	Flavonoids	Shinoda test	+
		Alkaline reagent test	+
6	Phytosterol	Salkowski test	+
		Liebermann Burchard's test	+
7	Glycosides	Keller-kilani test	+
		NaOH test	+
8	Saponin	Froth test	+
		Olive oil test	+
9	Gums and Mucilages	Alcohol test	-
		Ruthenium red test	+
10	Oils and Fats	Spot test	+

+ present; - absent

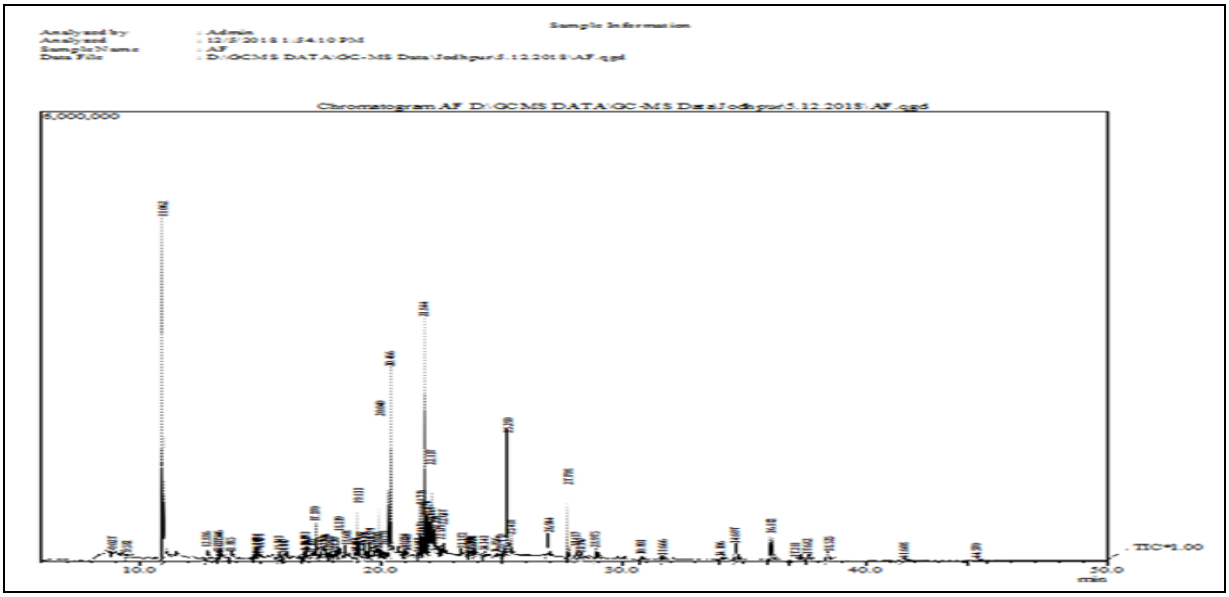


FIG. 2: GC-MS CHROMATOGRAM OF METHANOLIC EXTRACT OF *ABUTILON FRUTICOSUM*

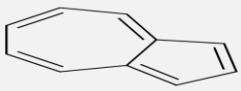
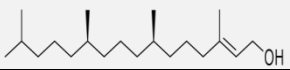
All the major biologically active compounds identified through GC-MS analysis were listed in **Table 3** along with their peak area, molecular structure, chemical nature, and bioactivities.

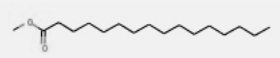
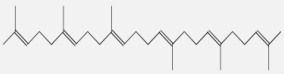
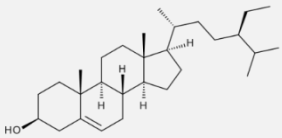
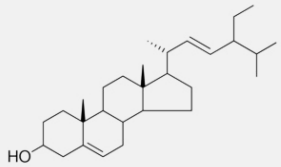
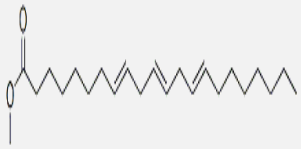
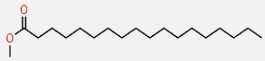
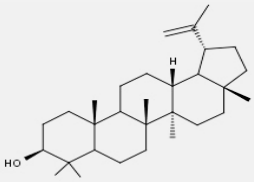
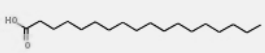
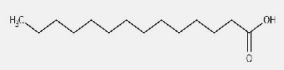
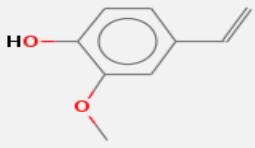
TABLE 2: PHYTOCHEMICAL COMPOUNDS IDENTIFIED IN THE METHANOLIC LEAVES EXTRACT OF *ABUTILON FRUTICOSUM* BY GC-MS ANALYSIS

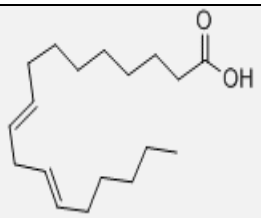
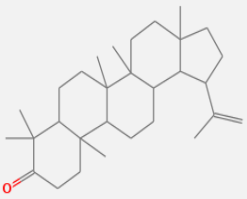
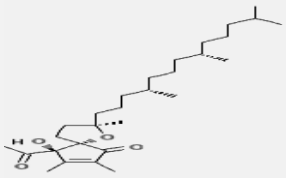
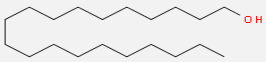
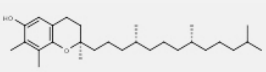
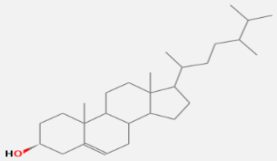
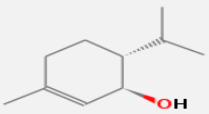
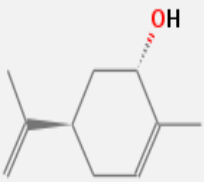
S. no.	RT	Name of compound	Molecular formula	Molecular weight	Peak area %	Compound nature
1	9.027	Unidentified				
2	9.582	Benzoic Acid, Methyl Ester	$C_8H_8O_2$	136	0.27	Carbohydrate ester
3	11.062	Azulene	$C_{10}H_8$	128	24.91	Aromatic hydrocarbon
4	12.886	2-Methoxy-4-Vinylphenol	$C_9H_{10}O_2$	150	0.99	Phenol
5	13.375	Phenol, 2,6-Dimethoxy-	$C_8H_{10}O_3$	154	0.20	Phenol
6	13.446	Phenol, 2-Methoxy-4-(2-Propenyl)-	$C_{12}H_{14}O_3$	206	0.44	Phenol
7	13.885	2-Cyclohexen-1-Ol, 3-Methyl-6-(1-Methylethyl)-, Cis-	$C_{10}H_{18}O$	154	0.23	Monoterpene
8	14.867	2-Cyclohexen-1-Ol, 2-Methyl -5-(1-Methylethenyl)-, Trans-	$C_{10}H_{16}O$	152	0.14	Monoterpene
9	14.930	Unidentified				
10	15.075	4-(2,6,6-Trimethyl-1,3-Cyclohe xadien-1-Yl)-3-Buten-2-One	$C_{13}H_{18}O$	190	0.21	Monoterpene
11	15.843	2(4h)-Benzofuranone,5,6, 7,7a -Tetrahydro-4,4,7a-Trimethyl-, (R)-	$C_{11}H_{16}O$	180	0.40	terpene
12	16.067	9-Octadecenoic Acid (Z)-	$C_{18}H_{34}O_2$	282	0.47	Fatty acid
13	16.866	Cyclopropanemethanol, 2-Methyl-2-(4-Methyl-3-Pentenyl)-	$C_{11}H_{20}O$	168	0.28	Alcohol
14	16.993	Cyclopropanemethanol, 2-Methyl-2-(4-Methyl-3-Pentenyl)-	$C_{11}H_{20}O$	168	0.52	Alcohol
15	17.192	Piperidine, 1-(1-Cyclopenten-1-Yl)-	$C_{10}H_{17}N$	151	0.07	Alkaloid
16	17.370	9-(3,3-Dimethyl-2-Oxiranyl) -2,7-Dimethyl-2,6-Nonadien-1-Ol	$C_{15}H_{26}O2$	238	1.25	Alcohol
17	17.592	Cyclohexene, 1,5,5-Trimethyl-6-Acetylmethyl-	$C_{12}H_{20}O$	180	0.20	Monoterpene
18	17.716	4h-1,4-Epoxy-4a,7-Methanonaphthalene, 1,5,6,7,8,8a-Hexahydro-, (1.Alp	$C_{11}H_{14}O$	162	0.78	Ketone
19	17.916	Heptadecanoic acid, Methyl Ester	$C_{18}H_{36}O_2$	284	0.14	Fatty acid methyl ester
20	18.150	9-(3,3-Dimethyloxiran-2-Yl)-2,7-Dimethylnona-2,6-Dien-1-Ol	$C_{15}H_{26}O_2$	238	0.16	Alcohol
21	18.339	Tetradecanoic acid	$C_{14}H_{28}O_2$	228	1.01	Fatty acid
22	18.608	2(4h)-Benzofuranone, 5,6,7,7a-Tetrahydro-6-Hydroxy-4,4,7a-Trimethyl	$C_{11}H_{16}O_3$	196	0.52	Benzofuran
23	19.000	Palmitic acid	$C_{16}H_{32}O_2$	256	0.17	Fatty acid
24	19.133	Neophytadiene	$C_{20}H_{38}$	278	2.17	Sesquiterpenoid
25	19.193	2-Pentadecanone,6,10,14-Trimethyl-	$C_{18}H_{36}O$	268	0.23	Sesquiterpenoid
26	19.387	Unidentified				
27	19.579	3,7,11,15-Tetramethyl-2-Hexadecen-1-Ol	$C_{20}H_{40}O$	296	0.62	Diterpene
28	19.767	Undec-10-Ynoic Acid, 3-Methylbut-2-En-1-Yl Ester	$C_{16}H_{26}O_2$	250	0.26	Fatty acid ester
29	19.920	7,9-Di-Tert-Butyl-1-Oxaspiro (4,5)Deca-6,9-Diene-2,8-Dione	$C_{17}H_{24}O_3$	276	0.30	Oxaspiro compound/ cyclic ketone
30	20.040	Hexadecanoic Acid, Methyl Ester	$C_{17}H_{34}O_2$	270	5.05	Fatty acid ester
31	20.221	9-Octadecenoic Acid (Z)-	$C_{18}H_{34}O_2$	282	0.48	Fatty acid
32	20.466	N-Hexadecanoic Acid	$C_{16}H_{32}O_2$	256	13.27	Fatty acid
33	21.024	Palmitic Acid	$C_{16}H_{32}O_2$	256	0.17	Fatty acid
34	21.108	9-Octadecenoic Acid (Z)-	$C_{18}H_{34}O_2$	282	0.14	Fatty acid
35	21.608	2-Hexadecen-1-Ol, 3,7,11,15-Tetramethyl-, [R-[R*,R*-(E)]]- (T-Phytol)	$C_{20}H_{40}O$	296	0.11	Diterpene
36	21.676	9,12-Octadecadienoic Acid, Methyl Ester	$C_{19}H_{34}O_2$	294	0.56	Fatty acid ester
37	21.735	8,11,14-Docosatrienoic Acid, Methyl Ester	$C_{23}H_{40}O2$	348	1.65	Omega 3 fatty acid
38	21.844	Phytol	$C_{20}H_{40}O$	296	9.51	Diterpene

39	21.970	Methyl Stearate	$C_{19}H_{38}O_2$	298	1.38	Fatty acid ester
40	22.069	Linoelaidic acid	$C_{18}H_{32}O_2$	280	0.85	Omega 6 fatty acid
41	22.137	9,12,15-Octadecatrienoic Acid, (Z,Z,Z)-	$C_{18}H_{30}O_2$	278	3.54	Omega 3 fatty acid
42	22.319	Octadecanoic Acid	$C_{18}H_{36}O_2$	284	1.04	Fatty acid
43	22.535	7,10-Hexadecadienoic Acid, Methyl Ester	$C_{17}H_{30}O_2$	266	0.30	Fatty acid ester
44	22.637	Eicosane	$C_{20}H_{42}$	282	0.30	Hydrocarbon
45	23.372	3-Cyclopentylpropionic Acid, 2-Dimethylaminoethyl Ester	$C_{12}H_{23}NO_2$	213	0.25	Aliphatic carboxylic acid
46	23.700	4,7,7-Trimethyl-3,9-Dioxa-Tricyclo[6.1.0.0 2,4]Nonan-5-One	$C_{10}H_{14}O_3$	182	0.05	Ketone
47	23.756	Cyclopropanebutanoic Acid, 2-[[2-[[2-[(2-Pentylcyclopropyl) Methyl]Cyclopropyl]Methyl]Cycl	$C_{25}H_{42}O_2$	374	0.20	Cyclopropane carboxylic acid
48	23.887	Cyclohexanebutanal, 2-Methyl-3-Oxo-, Cis-	$C_{11}H_{18}O_2$	182	0.26	Aldehyde
49	24.343	8-Heptylpentadecane	$C_{22}H_{46}$	310	0.15	Hydrocarbon
50	24.856	3-Cyclopentylpropionic Acid, 2-Dimethylaminoethyl Ester	$C_{12}H_{23}NO_2$	213	0.11	Aliphatic carboxylic acid
51	25.110	Trichloroacetic Acid, Tetradecyl Ester	$C_{17}H_{31}Cl_3O_2$	372	0.22	Carboxylic acid derivative
52	25.290	Hexadecanoic Acid, 2-Hydroxy-1-(Hydroxymethyl)Ethyl Ester	$C_{19}H_{38}O_4$	330	5.55	Fatty acid ester
53	25.431	Di-N-Octyl Phthalate	$C_{24}H_{38}O_4$	390	0.57	Aromatic dicarboxylic acid derivative
54	26.944	Octadecanoic Acid, 2,3-Dihydroxypropyl Ester	$C_{21}H_{42}O_4$	358	1.45	Fatty acid derivative
55	27.798	Squalene	$C_{30}H_{50}$	410	3.46	Triterpene
56	28.137	Alpha.-Tocospiro A	$C_{29}H_{50}O_4$	462	0.39	Tocopherol
57	28.367	Alpha.-Tocospiro A	$C_{29}H_{50}O_4$	462	0.47	Tocopherol
58	28.975	1,3-Cyclohexadecanedione,6-Nitro-	$C_{16}H_{27}NO_4$	297	0.68	Ketone
59	30.803	Gamma.-Tocopherol	$C_{28}H_{48}O_2$	416	0.36	Tocopherol
60	31.666	1-Eicosanol	$C_{20}H_{42}O$	298	0.38	Hydrocarbon
61	34.106	Campesterol	$C_{28}H_{48}O$	400	0.33	Phytosterol
62	34.697	Stigmasta-5,22-Dien-3-Ol	$C_{29}H_{48}O$	412	1.71	Phytosterol
63	36.172	Beta.-Sitosterol	$C_{29}H_{50}O$	414	3.19	Phytosterol
64	37.211	Unidentified				
65	37.682	Lup-20(29)-En-3-One	$C_{30}H_{48}O$	424	0.64	Triterpenoid
66	38.525	Lupeol	$C_{30}H_{50}O$	426	1.21	Triterpenoid
67	41.608	1,1,4,7-Tetramethyldecahydro-1h-Cyclopropa[E]Azulen-4-Ol	$C_{15}H_{26}O$	222	0.36	Sesquiterpene
68	44.570	Oxirane, Hexadecyl-	$C_{18}H_{36}O$	268	0.33	Epoxide
					100.0	

TABLE 3: MAJOR COMPOUNDS IDENTIFIED IN *ABUTILON FRUTICOSUM* METHANOLIC LEAVES EXTRACT WITH THEIR BIOACTIVITIES

S. no.	Name of compound	Peak area %	Compound nature	Molecular structure	Biological activity of compound
1	Azulene	24.91	Aromatic hydrocarbon		Anti-microbial and anti-inflammatory, antipyretic activity[10]
2	n-Hexadecanoic acid /Palmitic acid	13.27	Fatty acid		Antibacterial [11], anti-inflammatory, anti-oxidant, hypocholestrolemic, nematicide, pesticide, anti-androgenic, hemolytic, mosquito larvicidal activity [12]
3	Phytol	9.51	Diterpene		Antimicrobial, anti-cancerous, anti-inflammatory and diuretic properties [13]

4	Hexadecanoic Acid,2-Hydroxy-1(Hydroxymethyl) Ethyl Ester	5.55	Fatty acid ester		Pesticide, hemolytic, flavoring agent, Antioxidant [20, 21]
5	Hexadecanoic Acid, Methyl Ester	5.05	Fatty acid ester		Antioxidant, antimicrobial hypocholestrolemic, nematicide hemolytic[20, 21]
6	9,12,15-Octadecatrienoic Acid, Z,Z,Z)- /alpha linolenic acid	3.54	Omega 3-Fatty acid		Anti-inflammatory, antibacterial, anticancerous, Vasodilator [22]
7	Squalene	3.46	Triterpene		Anti-bacterial, antitumour,anti-inflammatory,antioxidant,anti-atherosclerotic[23]
8	Beta.-Sitosterol	3.19	Phytosterol		Anticancerous, androgenic, angiogenic, antibacterial, antifertility, anti-inflammatory [24, 25, 26]
9	Neophytadiene	2.17	Sesquiterpenoid		Antibacterial, analgesic, anti-inflammatory, antipyretic, antioxidant [27]
10	Stigmasta-5,22-Dien-3-ol	1.71	Phytosterol		Anti-inflammatory, antihepatoxic, antiviral, estrogenic, hypocholestrolemic, sedative [28]
11	8,11,14-Docosatrienoic Acid, Methyl Ester	1.65	Omega 3 fatty acid		Nutrient, energy source, emulsifier, surfactant, cardioprotective [22]
12	Methyl Stearate	1.38	Fatty acid ester		Antifoaming agent, fermentation nutrient, flavoring agent [20, 29, 30]
13	Lupeol	1.21	Diterpene		Antimicrobial, anti-inflammatory, anticancerous properties [31]
14	Octadecanoic acid	1.04	Fatty acid		Octadecanoic acid; Antimicrobial activity [20]
15	Tetradecanoic acid/Myristic acid	1.01	Fatty acid		Antioxidant, antimicrobial, Lubricant, anticancerous, cosmetics [32]
16	2-Methoxy-4-Vinylphenol	0.99	Phenol		Anti-tumour, antimicrobial, anti-inflammatory properties [33]

17	Linoelaidic acid	0.85	Omega 6 fatty acid		Reduces obesity, melasma treatment, immune function modulation [34]
18	Lup-20(29)-En-3-One	0.64	Triterpenoid		Anti-cancerous, antidiabetic, antiviral activity [35]
19	alpha tocospiro A	0.47	Tocopherols		Anti-tumour, anti-Inflammatory [36]
20	1-Eicosanol	0.38	Fatty alcohol		Emollients, cosmetic Antimalarial, antifungal, antioxidant [34]
21	gamma Tocopherol	0.36	Tocopherols		Anti-tumour, anti-inflammatory [37], anti-aging, analgesic, vasodilator [38]
22	Campesterol	0.33	Phytosterol		Anti-cancerous, anti-tumour properties [19]
23	2-Cyclohexen - 1-Ol, 3-Methyl-6-(1-Methylethyl)-, Cis-2/Piperitol	0.23	Monoterpenoid		Surfactant, emulsifier, Flavoring agent [34]
24	Cyclohexen-1-Ol, 2-Methyl-5-(1-Methylethenyl)-, Trans-/Carveol	0.14	unsaturated, monocyclic monoterpenoid alcohol		Prevent breast cancer [39]

DISCUSSION: *Abutilon fruticosum* is a rare and endemic plant of the Indian Thar desert. As the plant belongs to the genus *Abutilon* which has been used since ancient times to treat various diseases and ailments. Most of the compounds identified from the plant mainly belong to phenols, phytosterols, terpenes, fatty acids, and esters. These compounds were reported to contain various medicinal properties such as anti-inflammatory, antimicrobial, anticancerous, mosquito larvicidal, hepatoprotective activity, *etc*. Azulene is an aromatic hydrocarbon identified with highest peak area reported to have anti-microbial and anti-inflammatory, antipyretic, and soothing properties [10]. Polyunsaturated fatty acids and their esters such as 8,11,14 Docosatrienoic acid, methyl ester, alpha linolenic acid, *etc*. were identified from the plant extract known to contain anti-inflammatory, anticancerous, vasodilator and antimicrobial properties [11]. These are important components for the production and movement of energy throughout the body, for the regulation of transportation of oxygen and for maintaining the integrity of cell structure and to control the cholesterol level of

blood. Various fatty acids and their esters were identified from the extract that is known to possess anti-microbial, antifungal, anti-inflammatory properties [12]. Phytol is acyclic diterpene alcohol with known antimicrobial, anticancer, anti-inflammatory, and diuretic properties [13]. It is used as a precursor of vitamin E [14] and vitamin K1 [15]. It is used in cosmetics, shampoos, detergents [16]. Phytosterols are plant-based sterols with potential to inhibit lung, stomach, ovarian, breast, colon as well as prostate cancer [17, 18, 19]. Some medicinally important phytosterols identified in the plant with less than 1 percent area were Beta-sitosterol, stigmasterol, and gamma sitosterol, respectively.

CONCLUSION: Preliminary phytochemical screening and GC-MS analysis of a methanolic extract of leaves of *Abutilon fruticosum* reveal the presence of various medicinally valued phytoconstituents such as alkaloids, terpenoids, phenols, phytosterols *etc*. This is the first report of the identification of active constituents from the leaf of this plant. The biological properties of compounds present in leaf extract of *Abutilon fruticosum* supports its medicinal utility. Although, other species of this genera have been explored very well and of great medicinal value. The present study could provide a valuable knowledge about this plant to be used in pharmacological research for human welfare after its toxicology test.

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