GC –MS Studies of SC seed AgNPs by using methonolic Ethanolic Solution

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ABSTRACT

The aim of this study was to investigate the presence of bioactive compounds in the methanolic Ethanolic Seed AgNps of Syzygium Cumini . These washed SC seeds with distillated water to clean the surface pollutants and dried in the air and absence of sunlight at the Lab. temperature (27 ± 2 °C). The dried seeds were milled by electric milling and sieved to powders. 5 g of powders were introduced to 100 ml of distilled water in the beaker and heated to 80 °C for 15 min. After cooling to Lab. temperature filtered with 0.45 µ filter paper. 10 mg of seed extract was added to 90 mL of 1 mM aqueous AgNO3 solution for reduction of Ag+ ions and incubated at room temperature in dark condition for 24 hours. The solution was then centrifuged at 10,000 rpm for 20min to separate the silver nanoparticles. These silver nanoparticles were washed three times with deionized water and stored as lyophilized powder. These lyophilized powder 1gm added to 100 ml of ethanol and methanol respectively. The temperature was set at their boiling points and 10-12 cycles were run for concentrating the Sc AgNps extracts. The rotary vacuum concentrator was used for further drying the extracts at the room temperature and the dried mass was reconstituted at the concentration of 1 mg/ml. This solution as capping agent was maintained in the refrigerator for further use.

Keywords: Syzygium cumini, Gas chromatography-mass spectrometry analysis, Methonol Ethanol. AgNps, Siver nano particles.

lINTRODUCTION

Medicinal plants are capable of synthesizing variety of organic compounds with low molecular weight (MW) which is called as secondary metabolites, which are usually with unique and complex structures [1], and it is used as traditional medicine to maintain healthiness, as well as to inhibit, identify, and recover physical and mental illnesses for human and animal [2]. These medicinal products directly acted as medicine or as a source for modern drug development for various fungal and bacterial infections, an antimalarial drug, and anticancer drugs [3-5]. In recent decades, it increases the pharmacological evaluation as well as industrial pollutant removal process of phytoconstituents and their chemical composition values give more efficacies to degrade heavy metals and [6,7]. Many modern methods were used for identification and quantification of bioactive compounds in plant materials. Rather than, gas chromatography-mass spectrometry (GC-MS) has become confidently developed as a key scientific platform for low molecular (secondary) metabolite profiling in both plant and animal species [8,9].

Syzygium cumini is a small tree, popularly known as 'Rose apple (Syzygium Cumini)which is cultivated throughout India for the edible fruit (black plum) and is testified to contain gallic acid, vitamin C, cyanidin, tannins, anthocyanins,Oleanolic, ellagic,quercetin,myricetin,kaemoferol,betulinic acid,beta Sitsterol, delphinidin and other components [10,11]. For diabetes mellitus, the seed extract is used as a remedy in many countries [12, 13]. Industrial pollutant removal componenet present in this AgNps from Sc Seed [14, 15]. In the novelty of this study, the previous researchers have studied the preliminary phytochemical analysis and bioactivity of this SC Seed's against clinical pathogens, but in our present study, it is designed to explore the bioactive compounds by GC-MS presented in the methanolic Ethanolic solution which Present in Seed AgNps from S.Cumini .

METHODS

Preparation of silver nitrate solutions:

The molecular weight of the Silver nitrate-169.86gm was weighed per litter. This method was prepared by one molar silver nitrate solution each. In other method of preparation 1mM solution of silver nitrate was weighed by 0.169.86 mg/liter. The

Erlenmeyer flask 2 (250 ml) containing 100 ml each de-ionized water for dissolved AgNO3 salts for preparation of 1mM silver nitrate solutions.

Extraction and fractionation of S. cumini seeds:

The collected plant's seeds (Syzygium cumini) were identified by “The Botany Herbarium”(Departments of Zoology), Govt women college(Autonomous), Kumbakonam. The seeds of the plant S. cumini were thoroughly washed and dried at 370 C. The dried seeds were further pulverized into fine powder. 25gm of the powdered seed was taken for the extraction purpose in ethanol as the solvent, by using Soxhletor apparatus. This seed extract (Sc) was used for studying the various antioxidant assays. The 5 gm of seeds (Syzygium cumini) were taken into an Erlenmeyer flask with 100 ml of sterile de-ionized water. The mixture was boiled for 5-10 min at 100ºC; finally the mixture was filtered and stored at 4°C for further therapeutic studies.

Biosynthesis of Silver Nanoparticles from S. cumini Seed (ScSNPs):

A measured quantity of finely powdered seed (5gm) was mixed with 100mL of deionized water and then boiled the mixture for 5 min before finally decanting it. This suspension was then centrifuged at 5,000 rpm for 15 minutes at 40 C using fresh deionized water. The extract volume was adjusted to an appropriate volume by adding deionized water, and filtered through Whatman filter paper No.1. 10 mL of seed extract was added to 90 mL of 1 mM aqueous AgNO3 solution for reduction of Ag+ ions and incubated at room temperature in dark condition for 24 hours. The solution was then centrifuged at 10,000 rpm for 20min to separate the silver nanoparticles. These silver nanoparticles were washed three times with deionized water and stored as lyophilized powder.

GC-MS analysis for bioactive compounds

Preparation of organic solvent extracts of S. cumini seeds AgNps

Ethanolic and methanolic extracts of S. cumini seeds AgNps were prepared by using a Soxhlet apparatus. 10 mg of seed extract was added to 90 mL of 1 mM aqueous

AgNO3 solution for reduction of Ag+ ions and incubated at room temperature in dark condition for 24 hours. The solution was then centrifuged at 10,000 rpm for 20min to separate the silver nanoparticles. These silver nanoparticles were washed three times with deionized water and stored as lyophilized powder.These lyophilized powder 1gm added to 100 ml of ethanol and methanol respectively. The temperature was set at their boiling points and 10-12 cycles were run for concentrating the Sc AgNps extracts. The rotary vacuum concentrator was used for further drying the extracts at the room temperature and the dried mass was reconstituted at the concentration of 1 mg/ml.

GC-MS analysis was performed at IICPT Thanjavore India. India. Each 5 ml of Seed AgNps dissolved in 1 ml methanol and 1 ml of Ethanolic and the extract of AgNps was analyzed with GC-MS. Separation process was carried out with CE GC 8000 top MSMD 8000 Fyson instrument with Db 35 mr column (10 m×0.5 mm, 0.25 mm film thickness). For separation, heating programs were executed with the help of helium carrier gas from 100 to 250°C for 3 minutes at the flow rate of 1ml/min in the split mode (1:50). An each aliquot of (2 µl) of methanol and Ethanol extract was injected into the column with the injector heater at 250°C

Identification of components

The mass spectra of compounds in the sample were attained by electron ionization (E1) at eV, and the detector operated in scan mode from 20 to 600 atomic mass units. Molecular structure, molecular mass, and fragmentations were used for identifications. The phytoconstituents were identified with the help of standard mass spectral database of WILEY and NIST Libraries [16,17].

RESULTS AND DISCUSSION

In the present study, the collected Sc Seed with AgNps were identified and authenticated as S. Cumini (BSI/IICPT/5/23/2017/GC.1270) in BSI, IICPT Thanjavore Tamil Nadu,India.

The detection of the compounds present in the ethanolic and methanolic extract was done on the basis of direct comparison of the mass spectral data and retention time those for standard compounds, and by computer matching with the Wiley 229, Nist 107, 21 Library (USA), as well as by comparison of the fragmentation patterns of the mass spectra reported in

the literature (Fig-1 and 2).14-16 The compounds were identified by comparing their retention time and covate indexes with that of literature and by interpretation of mass spectra. The basis of separation of organic components in GC-MS analysis was polarity and charge to mass ratio. The quantitative estimation of each peak was made by estimating area of the peak. The GC-MS analysis of S. cumini seed AgNps revealed the presence of phytochemical constituents such as phenolic compounds, essential oils, organic hydrocarbons etc.

GC-MS analysis

The Methanolic and Ethanolic Seed AgNps of S. cumini was analyzed for the presence of phytocompounds by GC-MS as shown in Fig. 2.

Totally, 54 effective compounds were identified from the chromatogram. The bioactive compounds were predicted by their retention time (RT), peak area percentage (%), MW, molecular formula, and their biological activities with the help of PubChem Compound (NCBI), Wiley and NIST Libraries (Table 1 and 2).

The first active compound 4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2.alpha.,4.alpha.,4a.alpha.,8a.beta.) was identified in less RT (5.472) (0.10 %), and the last compound Stigmast-5-en-3-ol was identified in much longest RT (46.573) and high percentage peak area (3.97) was observed. Among these 54 compounds, too many phytocompounds having different biological activities, rather than the compounds categorized in different forms based on their biological activities such as antipyretic, antiparasitic (antimalarial), antibacterial, antifungal, and antiviral compounds, are shown in Tables 2 and 3. 4-Methylbenzyl chloride was observed in the 16.117 RT which showed anticancer activity and used as a drug for genital disorders. Gallic Acid and ellagic acid were observed in 18.171RT/21.147RT which shows removal agent for heavy metals. Delphinidine Beta sitosterol was observed in the 31.316RT/27.161RT which shows anti androgen activity which cures PCOS. SC seed AgNPs are reported to be a rich source of ellagitannins (ETs), including androgen suppressor enzyme (which is used to cure PCO)corilagin, 3,6-hexa hydroxyl diphenoyl glucose and its isomer 4,6-hexahydroxy diphenoyl glucose, 1-galloylglucose, 3-galloylglucose, gallic acid, and ellagic acid (EA) [63]. gallic acid, vitamin C,cyanidin, tannins, anthocyanins,Oleanolic, ellagic,quercetin,myricetin,kaemoferol,betulinic acid,beta Sitsterol, delphinidin and other components No biological activity was reported for the compounds of RT1-3, 7, 8, 10, 15, 16, 17, 19, 20, 24, 27, 28, 31-34, 41 (Table 1).

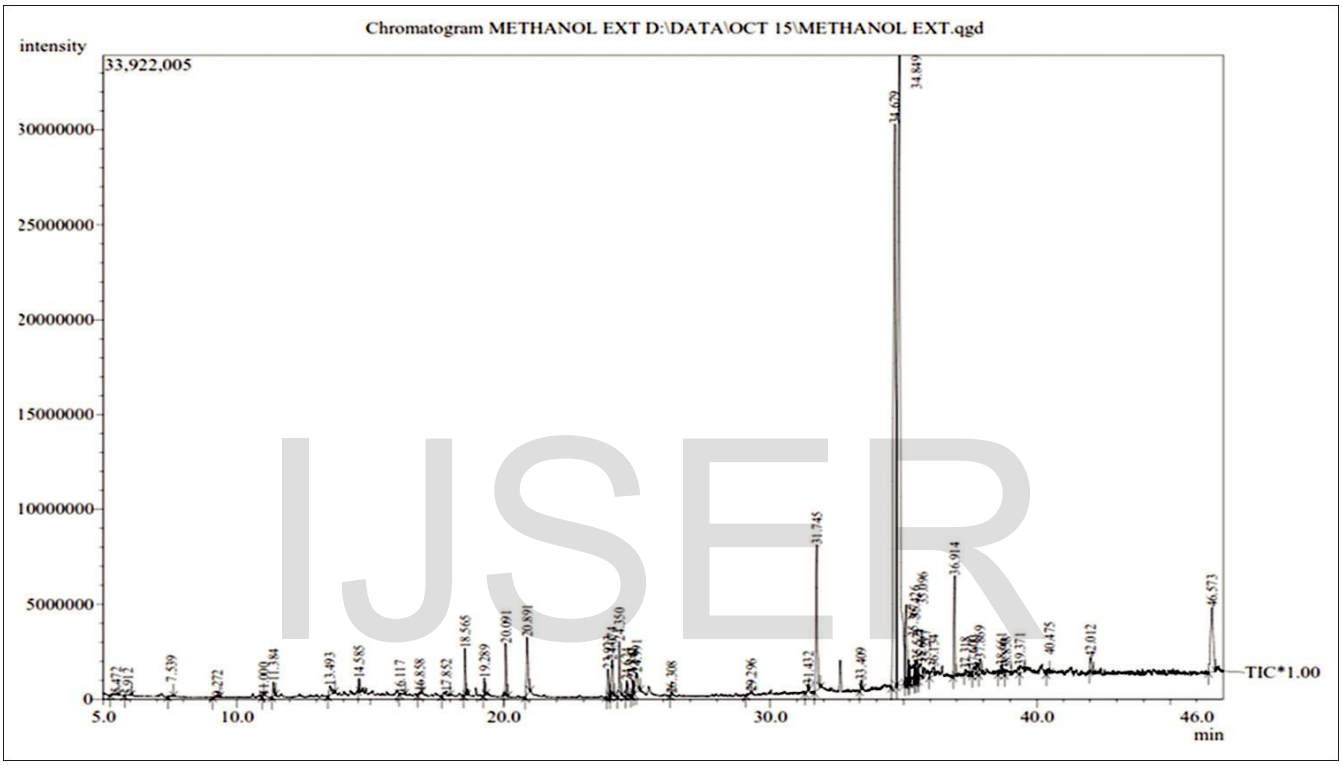

Fig. 2: Gas chromatography-mass spectrometry spectrum of methanolic SC Seed AgNps

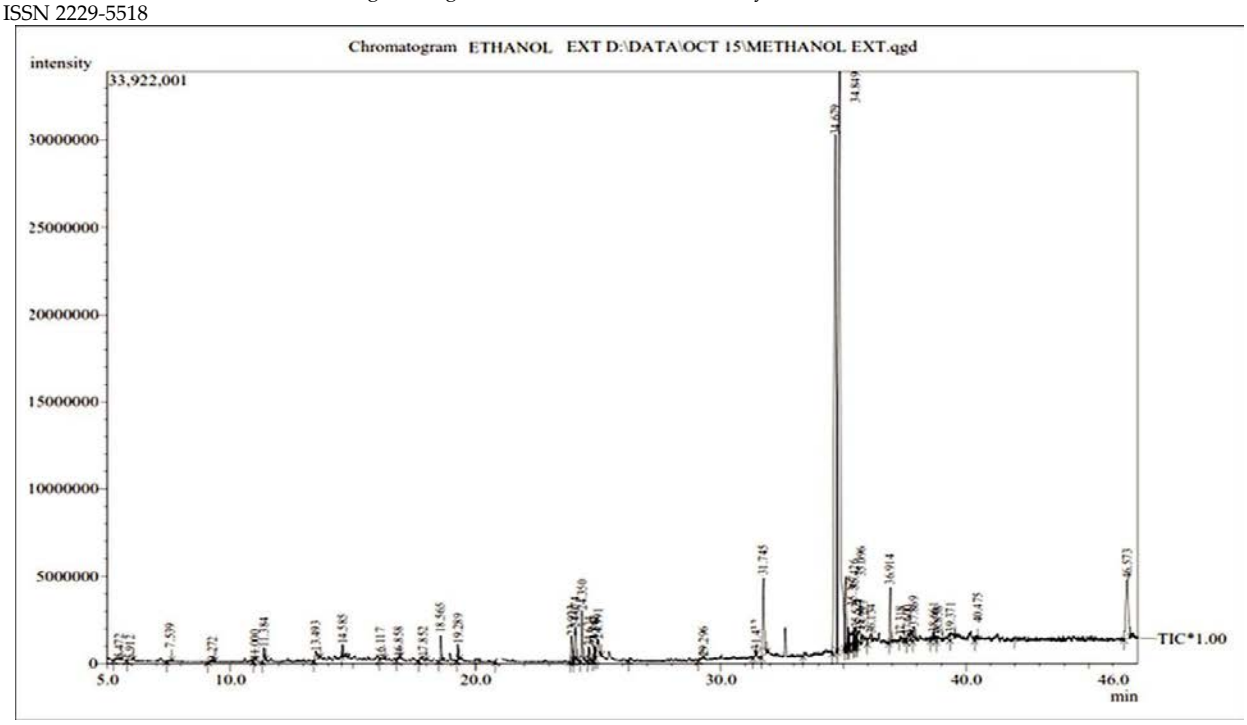

Fig. 3: Gas chromatography-mass spectrometry spectrum of Ethanolic SC Seed AgNps

Table 1: Phytocompounds present in the methanolic SC seed AgNps

Peak	RT	Compound name	Molecular formula	Molecular Weight (g/mol)	Peak Area (%)	Biological activity
1	5.472	4-Quinolinol, 4-ethenyl-1-ethyldecahydro-2-methyl-(2. alpha., 4.alpha.,4a.alpha.,8a.beta.)	C14H25NO	223.3544	0.10	No activity reported
2	5.912	Glucitol, 6-O-nonyl	C15H32O6	308.41098	0.01	No activity reported
3	7.539	Octadecanoic acid, 9,10-epoxy-18-(trimethylsiloxy)-, methyl ester, cis-	C22H44O4Si	282.46136	0.04	No activity reported
4	9.272	1-Deoxy-d-mannitol	C6H14O5	166.17236	0.02	Antibacterial, Antipyretic
5	11.000	3-methyl-2-methylsulfanyl-5-nitro-6-pyridin4-ylpyrimidin-4-one.	C11H10N4O3S	278.2871	−0.01	Antipyretic, Antiinflamatory
6	11.384	2,6-dibromo-4-[2-(3,5-dibromo-4-hydroxyphenyl) propan-2-yl] phenol	C15H12Br4O2	543.87058	0.36	Anticancer
7	13.493	4Cyclopropylmethylbenzonitrile	C11H11N	157.21174	0.44	No activity reported
8	14.585	alcohol ((3Z)-4,8,11,11-tetramethylbicyclo[7.2.0] undec-3-en-5-ol)	C15H26O	222.36634	0.23	No activity reported
9	16.117	4-Methylbenzyl chloride, 1-(Chloromethyl)-4-methylbenzene 18-fluoro-, methyl ester	C8H9Cl	140.61006	0.03	Anticancer, mucolytics, drug for genital disorder
10	16.858	Methyl 18-fluorooctadecanoate, octadecanoic acid,	C19H37FO2	316.49428	0.01	No activity reported
11	17.852	E-15-Heptadecenal, (E)-heptadec-15-enal	C17H32O	252.43538	0.23	Fatty acid amide hydrolase
12	18.565	2,6,10-trimethyl, 14-ethylene-14-pentadecne	C20H38	278	0.93	Antiproliferative activity
13	19.289	3,7,11,15-Tetramethyl-2-hexadecen-1-ol (2-Hexadecen-1-ol, 3,7,11,15-tetramethyl)	C20H40O	296.5310	0.36	Precursor of synthetic forms of vitamin E and vitamin K1
	20.091	Hexadecanoic acid, methyl ester (palmitic acid)	C17H34O2	270.4507	1.20	Used to produce soaps, cosmetics, and release agents
15	20.891	PENTADECANOIC ACID, pentadecylic acid	C15H30O2	242.3975	1.89	No activity reported
16	23.923	Methyl (9Z,12Z)-9,12-heptadecadienoate	C18H32O2	280.445	0.71	No activity reported
17	24.074	Linolenic acid, pinolenic acid, 5,9,12-octadecatrienoic acid	C18H30O2	278.4296	1.12	No activity reported
18	24.350	3,7,11,15-Tetramethyl-2-hexadecen-1-ol. (2-Hexadecen-1-ol, 3,7,11,15-tetramethyl)	C20H40O	296.5310	1.51	Precursor of synthetic forms of vitamin E and vitamin K1
19	24.624	Tetradecanoic acid, 12-methyl-, methyl ester. (Methyl 12-methyltetradecanoate)	C16H32O2	256.4241	0.36	No activity reported
20	24.841	Ethyl (9E,12E)-9,12-octadecadienoate	C20H36O2	308.499	0.45	No activity reported
21	24.991	Butyl (9E,12E,15E)-9,12,15-octadecatrienoate	C22H38O2	334.536	1.11	Antiinflammatory, hypocholesterolemic,

						cancer preventive, hepatoprotective
22	26.308	(E,3R)-2-BENZYLIDENE-3-HYDRO	C11H12O3	192	0.00	Antineoplastic, drugs for dermatological problem
23	29.296	4-bromo-5-nitro-1h-pyrazole-3-carboxylic acid	C4H2BrN3O4	235.98	0.01	Bradykinin B1 receptor antagonists to relieve adverse symptoms in mammals
24	31.432	1-O-hexadecylglycerol - bis-trimethylsi	C19H40O3	16. 2	0.09	No activity reported
25	31.745	3-Pentadecylphenol (3-n-Pentadecylphenol)	C21H36O	304.50994	4.75	Antipyretic, antibacterial, anti-inflammatory etc.
26	33.409	TETRACOSANE,(N-Tetracosane)	C24H50	338.6538	0.24	Drugs for dermatological, genital disorders, antibacterial and urinary problem
27	34.679	(E,E)-1,4,4-Trimethyl-8-methylene-1,5-cyclounde cadiene; (beta.-Humulene)	C15H24	204.35106	29.76	No activity reported
28	34.849	Methyl(Z)-5,11,14,17-eicosatetraenoate (RACNRUFXUGWSBR-IQSQJELJSA-N)	C21H34O2	318.49346	36.59	No activity reported
29	35.096	3-Pentadecylphenol (Phenol, 3-pentadecyl)	C21H36O	304.50994	2.97	Drug for dermatological Disorders, antibacterial activity.
30	35.217	methyl (4R,9R,10R,15R)-4-(cyanomethyl)-4,9,10-trimethyl-3-[2-methyl-1-oxo-1-(1,3-thiazol-2-ylamino) propan-2-yl]-15-prop-1-en-2-yl-2,3,5,6,7,8,11,12,14,15,16,17 -dodecahydro-1H-cyclopenta[a] phenanthrene-13-carboxylate	C34H49N3O3S	579.83616	0.57	Ultra-violet absorbing properties, cerebral vasodilation activity
31	35.367	2-[2-[2-(4-nonylphenoxy) ethoxy] ethoxy] ethanol; 2-{2-[2-(4-NONYLPHENOXY) ETHOXY] ETHOXY} ETHANOL	C21H36O4	352.50814	1.23	No activity reported
32	35.426	Phenylacetic acid, 2-(1-adamantyl) ethyl ester	C20H26O2	298.41924	0.76	No activity reported
33	35.521	2-[2-[2-(4-nonylphenoxy) ethoxy] ethoxy] ethanol; 2-{2-[2-(4-NONYLPHENOXY) ETHOXY] ETHOXY} ETHANOL	C21H36O4	352.50814	0.61	No activity reported
34	35.667	Ethyl 7-amino[1,2,4]triazolo[1,5-a] pyrimidine-6-carboxylate(, 7-amino-, ethyl ester)	C8H9N5O2	207.18936	1.04	No activity reported
35	36.134	1H-Indole-2-carboxylic acid (Indole-2-carboxylic acid)	C9H7NO2	161.15738	0.55	Antitussive agent, antiasthmatic
36	36.914	2,6,10,14,18,22-Tetracosahexaene, 2,6,10,15,19,23-hexamethyl	C30H50	410.7180	2?.44	Drug for dermatological disorders, used to treat wound, ulcer
37	37.318	2,5-Di-tert-amylhydroquinone (79-74-3; Santouar	C16H26O2	250.37644	0.26	Drug for

		A)				Dermatological disorders, anticancer
38	37.600	2-BIPHENYLENECARBOXYLIC ACID	C17H14O4	282	0.45	Antimalarial, drug for nervous disorders etc.,
39	37.869	(Z)-7-Hexadecenal, 7-Hexadecenal, (Z)	C16H30O	238.4088	0.59	Antiviral activity, organic fertilizer
40	38.661	S-Ethyl ethanethioate, S-Ethyl thioacetate	C5H10OS	118.197	0.35	Drug for skeletal disorder, nervous system, antipsoriatic
41	38.858	Phenanthro (1,2-b) furan-10,11-dione, 6,7,8,9-tetrahydro-7-hydroxy-6-(hydroxymethyl)-1-methyl-; Przewaquinone F; 96839-31-5	C18H16O5	312.31664	0.37	No activity reported
42	39.371	1,4-Benzenediol, 2,5-bis (1,1-dimethylethyl)	C14H22O2	222	0.50	Drug for dermatological disorders, acting as analgesics
43	40.475	Quinoline-3-carboxylic acid (3-Quinolinecarboxylic acid)	C10H7NO2	173.16808	0.21	Antiparasitic, antimalarial, antibacterial, antibiotic, antiseptic etc.
44	42.012	alpha.-Tocopherol-.beta.-D-mannoside(2,5,7,8-Tetramethyl-2-(4,8,12-trimethyltridecyl)-3,4-dihydro-2H-chromen-6-yl hexofuranoside)	C35H60O7	592.8467	0.58	Antineoplastic activity, quaternary ammonium compounds
45	46.573	Stigmast-5-en-3-ol, Azuprostat; Nimbosterol; .alpha.-Phytosterol	C29H50O	414.7067	3.97	Antipyretic, antipruritic
46	498.748	Oleanolic acid	$C_{30}H_{48}O_3$	456.7	0.35	Suppress preneoplastic lesions
47	680.124	Betulinic acid	$C_{30}H_{48}O_3$	456.7	0.29	Tumour supressor
48	18.171	Ellagic acid	C14H6O8	302.197	0.69	Androgen Supressor
49	21.147	Gallic acid	C7H6O5	*170.12*	0.52	Phytoremidiant agent
50	214.123	Quercetin acid	C15H10O7	*302.238*	0.23	Phytoremidiant
51	561.01	Myricetin acid	C15H10O8	494.361	0.48	Inhibits epidermal growth factor (EGF)
52	361.149	Kaempferol acid	*C15H10O6*	*286.239*	0.35	inhibits the neoplastic transformation
53	31.316	beta-Sitosterol acid	$C_{29}H_{50}O$	*414.718*	0.42	Androgen supressor
54		Delphinidin cation acid	$C_{15}H_{11}O_7^+$	*303.246*	0.61	Tumour supressor

Table 2: Phytocompounds present in the Ethanolic Sc seed AgNps

Peak	RT	Compound name	Molecular formula	Molecular Weight (g/mol)	Peak Area (%)	Biological activity
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34	35.667	Ethyl 7-amino[1,2,4]triazolo[1,5-a] pyrimidine-6-carboxylate(, 7-amino-, ethyl ester)	C8H9N5O2	207.18936	1.04	No activity reported
35	36.134	1H-Indole-2-carboxylic acid (Indole-2-carboxylic acid)	C9H7NO2	161.15738	0.55	Antitussive agent, antiasthmatic
36	36.914	2,6,10,14,18,22-Tetracosahexaene, 2,6,10,15,19,23-hexamethyl	C30H50	410.7180	2?.44	Drug for dermatological disorders, used to treat wound, ulcer
37	37.318	2,5-Di-tert-amylhydroquinone (79-74-3; Santouar	C16H26O2	250.37644	0.26	Drug for

		A)				Dermatological disorders, anticancer
38	37.600	2-BIPHENYLENECARBOXYLIC ACID	C17H14O4	282	0.45	Antimalarial, drug for nervous disorders etc.,
39	37.869	(Z)-7-Hexadecenal, 7-Hexadecenal, (Z)	C16H30O	238.4088	0.59	Antiviral activity, organic fertilizer
40	38.661	S-Ethyl ethanethioate, S-Ethyl thioacetate	C5H10OS	118.197	0.35	Drug for skeletal disorder, nervous system, antipsoriatic
41	38.858	Phenanthro (1,2-b) furan-10,11-dione, 6,7,8,9-tetrahydro-7-hydroxy-6-(hydroxymethyl)-1-methyl-; Przewaquinone F; 96839-31-5	C18H16O5	312.31664	0.37	No activity reported
42	39.371	1,4-Benzenediol, 2,5-bis (1,1-dimethylethyl)	C14H22O2	222	0.50	Drug for dermatological disorders, acting as analgesics
43	40.475	Quinoline-3-carboxylic acid (3-Quinolinecarboxylic acid)	C10H7NO2	173.16808	0.21	Antiparasitic, antimalarial, antibacterial, antibiotic, antiseptic etc.
44	42.012	alpha.-Tocopherol-.beta.-D-mannoside(2,5,7,8-Tetramethyl-2-(4,8,12-trimethyltridecyl)-3,4-dihydro-2H-chromen-6-yl hexofuranoside)	C35H60O7	592.8467	0.58	Antineoplastic activity, quaternary ammonium compounds
45	46.573	Stigmast-5-en-3-ol, Azuprostat; Nimbosterol; .alpha.-Phytosterol	C29H50O	414.7067	3.97	Antipyretic, antipruritic

DISCUSSION

Nowadays, the study of the organic compounds for biological activity from natural resources has increased. The combination of GC-MS is a great technique for separation and identification of volatile and semi volatile bioactive compounds [18]. In general, the reliability of medicinal plant for its usage is evaluated by correlating the phytochemical compounds with their biological activities [19]. In the present exploration, totally 54 bioactive chemical constituents were identified in methanolic and Ethanolic SC seed AgNps having biological properties. From the GC-MS investigation, too many numbers of bioactive compounds were present in the SC seed AgNps which is mentioned in Table 1. 1-Deoxy-d-mannitol, 3-methyl-2-methylsulfanyl-5-nitro- 6-pyridin-4-ylpyrimidin-4-one, 3-Pentadecylphenol, 2-biphenylene carboxylic acid, Quinoline-3-carboxylic acid and Stigmast-5-en-3-ol are important phytoconstituents which have antipyretic and antiparasitic activities. Hexadecanoic acid, Octadecanoic, and Octadecadienoic compounds are observed in our study; these compounds are previously identified in different plant extracts reported.

CONCLUSION

GC-MS analysis reported the important biological components presented in our selected plant. Secondary metabolites will be rich in plants which are widely used in traditional medicine to treat and cure various ailments as well as in the modern medicine. The secondary metabolites such as alkaloids, phenols, tannins, and flavonoids are acted against different biological problems. The present investigation has given preliminary information of phytocompounds present in SC seed AgNps which is useful for the human community. Further investigations are needed in silico for these bioactive compounds which may add new knowledge to the information of S.cumini seed AgNps which is useful bioremediation Process of heavy metals such as Arsenic and Chromium IV. GC-MS analysis of SC Seed AgNps ESE showed higher content of esters and oils than polyphenolic constituents Major volatile and semivolatile compounds were identified in S. cumini seed AgNps. ethanolic and methanolic seed extracts. Some of the phytocostituents were obtained in both of the extracts in which caryophyllene, germacrene, thujanol, hexadecanoic acid, limonene oxide etc. showed the potency of both ESE and MSE. Due to high no. of bioactive components present in MSE, proved it a more pharmacologically active extract than ESE. The inhibitory activity of SC Seed AgNps was observed because of presence of polyphenols,flavonoids,terpeniods, sesquiterpenoids etc. Among the identified compounds hexadecanoic acid, dodecanoic acid have the antioxidant and antimicrobial activities.17 Furan carboxaldehyde has antimicrobial activity and used as a preservative.18 Bifuran has anticancer activity. Dimethyltricyclyl decane has antibacterial activity and used for the formation of petroleum jelly. Caryophyllene has antitumor, analgesic,antibacterial analgesic, anti-inflammatory and fungicidal activities suggesting an increase in electronegativity increases their activities.19 All of the bioactive components obtained are used for medicinal purposes and can show a good therapeutic value in the various treatments.

Thus, in our opinion, various phytocontents were explored in SC Seed AgNps along with Ethanolic and Methonolic compound by GC-MS analysis and Methonolic was found to be an enriched extract than that of Ethanolic compound. The study revealed the presence of some antimicrobial, insecticidal phytomediant agent, anti androgen activity and valuable constituents in SC Seede AgNps confirmed their pharmaceutical and industrial importance.

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