Comparative GC-MS Analysis Of Gomutra Sadhita Triphala Kwatha And Gomutra Sadhita Triphala Arka

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ABSTRACT:
Ayurveda is the science of life, which is dealing with life for 5000 years without any change in basic principles. *Panchavidha Kashaya Kalpana* are primary preparations that are considered underneath fundamental principles of *Bhaishajya Kalpana*. They are *Swarasa, Kalka, Kwatha, Hima and Phanta* and are recommended to consume immediately *(sadyosevana)*. *Kwatha Kalpana* being one of them has low shelf life, hence same *Kalpana* can be converted into *Arka Kalpana* to increase its shelf life up to a year. *Arka Prakasha*, the classical Ayurveda book mentions the distillation techniques for separation of the volatile bioactive compounds from a drug by using *Arka Yantra*. In the present study *Gomutra sadhita triphala kwatha* formulation mentioned in *Shotharogadhikara* in *Bhaishajya Ratnavali* textbook is modified into *Arka Kalpana* taking media as *Gomutra*. Furthermore, traditional *Gomutra sadhita triphala kwatha* (GTK) and *Gomutra sadhita triphala Arka* (GTA) both were subjected to GC-MS analysis.
Method: The present study mainly focuses on GC-MS evaluation of *Gomutra sadhita triphala kwatha* and *Gomutra sadhita triphala Arka* for detection of different components present in them. The comparative analysis will define the efficacy of respective dosage form. The preparation of both the forms of medicines was conducted at GMP certified Parul Ayurveda Pharmacy, Parul university.
Conclusion: Present study reveals that both dosage forms GTK and GTA contains entirely different components. *Arka* contains more volatile compounds having Anti-inflammatory effect. on contrary the *Kwatha* has the components which can exert protein denaturation and thereby act as anti-inflammatory.

Keywords- Kwatha Kalpana, Arka Kalpana, *Gomutra sadhita triphala kwatha* (GTK), *Gomutra sadhita triphala Arka* (GTA), GC-MS, Anti-inflammatory action.

INTRODUCTION:

Ayurveda is the science of life, which is dealing with life for 5000 years without any change in basic principles. Ayurveda gives us the freedom to modify system without changing its basic concepts. *Panchavidha Kashaya Kalpana* that are *Swarasa, Kwatha, Kalka, Hima and Phanta* are the basic preparations explained under *Bhaishajya Kalpana (1)*. All these *Kalpanas* has got its own importance but has shelf life of only 24 hours. *Kwatha Kalpana* is also having low shelf life hence same *Kalpana* can be converted into *Arka Kalpana* to increase its shelf life upto 1year. The general dose of the *Kwatha Kalpana* mentioned is 2 *Pala* i.e., 96ml as per AFI (2) whereas the dose of *Arka* depends on mode of administration. The AFI (3) mentioned 12-24ml of dose in most of the *Arka.* In *Arka Prakasha, Arka Kalpana* is also considered as *Panchavidha Kashaya Kalpana* (4). *Ayurveda Sara Sangraha* (5) also mentioned the *Arka Kalpana* in *Arka Prakarana* as it explains the quick therapeutic action of *Arka* due to its *Sara, Rupa, Laghu, Sheegra Paka* and *Drava Rupa. Shotha* in *Ayurveda* can be compared with inflammation in modern aspect. Inflammation is the tissue reaction, succession of changes that occur in living tissues when it is injured. Inflammation is the vascular response of living tissue to injury (6) whereas *Shopha* is defined as a swelling which is *Pruthu (*wide spread), *Grathita* presence of granthi), *Sama/Vishama (*regular or irregular) and is due to the accumulation of *Doshas* between the *Twak and Mamsa* in a particular site of the body (7) *Gomutra sadhita triphala kwatha* is a preparation given in classical textbook *Bhaishajya Ratnavali* in *Shotha Rogadhikara*.(8) Most herbal medicines prepared from crude plant extracts comprise a complex mixture of different phytochemical constituents (plant secondary metabolites). The chemical features of these constituents differ

considerably among different *Kalpana*. GC-MS method used for the analysis of the obtained extracts can be an interesting tool for testing the amount of some active principles in herbs used in therapeutic purpose. The aim of this study is to convert the *Kwatha Kalpana* into a new dosage form i.e., *Arka* with equivalent therapeutic effect. Also identify and compare the bioactive compounds of GTK and GTA by subjecting both traditional *Gomutra sadhita triphala kwatha* (GTK) and *Gomutra sadhita triphala Arka* (GTA) for GC-MS analysis.

MATERIALS AND METHODS:

The drugs *Haritaki, Bibhitaki* and *Amalaki* were procured from AIMIL pharmaceuticals Pvt. Ltd. Nalagarh (H.P) and *Gomutra* was arranged from local *Gaushala*. The preparation of both the forms of medicines was conducted at GMP certified Parul Ayurveda Pharmacy, Parul university.

Identification and Authentication of drugs was done at AIMIL Pharmaceuticals Pvt. Ltd. Nalagarh (H.P).

INGREDIENTS:

S.NO.	DRUGS	LATIN NAME	FAMILY	PART USED
1.	*Amalaki (9)*	*Emblica officinalis Gaertn*	Euphorbiaceae	Dried fruit pericarp
2.	*Bibhitaki (10)*	*Terminalia bellerica Roxb.*	Combretaceae	Dried fruit pericarp
3.	*Haritaki (11)*	*Terminalia chebula Retz.*	Combretaceae	Dried fruit pericarp
4.	*GO-MUTRA*	Cow's urine		

Kwatha preparation-: All the three drugs *Haritaki*, *Bibhitaki* and *Amalaki* were coarsely powdered and each weighed 100gm and mixed homogenously. *Gomutra* was collected from local *gaushala* around Parul Ayurved pharmacy and filtered through cotton cloth. Sixteen times of *Gomutra* was used in 300gm of *Triphala* i.e., 4.8 litres. The mixture is boiled until it reduced to 1/8th part to obtain *Gomutra sadhita Triphala Kwatha* (12) and collected in glass beaker for further study.

Arka preparation-: Each drug of *Triphala* is coarsely powdered and weighed in equal quantity and mixed homogenously. This coarse powder was soaked in 10 times of *Gomutra* as per AFI (13) for 4 hours. After that the soaked material was taken into the round bottom flask of distillation apparatus and continues controlled heat of about 60 degrees Celsius was given until 60% of *Arka* was collected in the glass bottle. The first 5 ml and last 5ml of Arka was discarded.

The prepared Kwatha and Arka was collected in a glass beaker and used for the GCMS study.

GC-MS (GAS CHROMATOGRAPHY MASS SPECTROSCOPY)

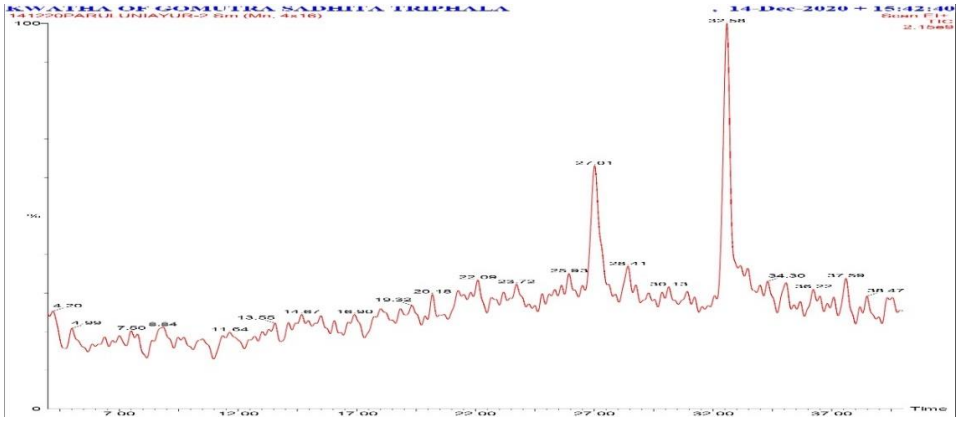
The GC-MS of *Gomutra Sadhita Triphala Kwatha* and *Gomutra Sadhita Triphala Arka* was carried out at Sophisticated Instrumentation Centre for Applied Research and Testing (SICART) Anand, Gujarat.

Preparation of both Sample Extract for GC-MS:

MODEL- Perkin Elmer AUTO 6M TURBOMASS. Sample injected at 250℃,
Oven temperature: 75℃.
Hold for 5min at the rate of 10℃/min up to 270℃/min; then holded for 10minutes.
Capillary column: PE-5AP.
Length of column: 30 meters
ID-0.250 microns
Thickness- 0.25mm
Injector temperature: 250℃
EI source temperature: 220℃
Mass range:20-610AMU.
Carrier Gas: Helium gas.

RESULTS:

FIGURE NO. 1



Area Percent Report

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Last Modified : Monday, December 14, 2020 4:25:46 PM
Printed : Monday, December 14, 2020 4:25:57 PM

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2	2	28.414	47,307,052.0	165,531,008	MM	0.00		0.00	TIC	5.32
3	3	32.575	574,001,152.0	513,781,248	MM	0.00		0.00	TIC	64.60

Area percent report Monday, December 14, 2020 4:25:57 PM Page 1

FIGURE NO:2

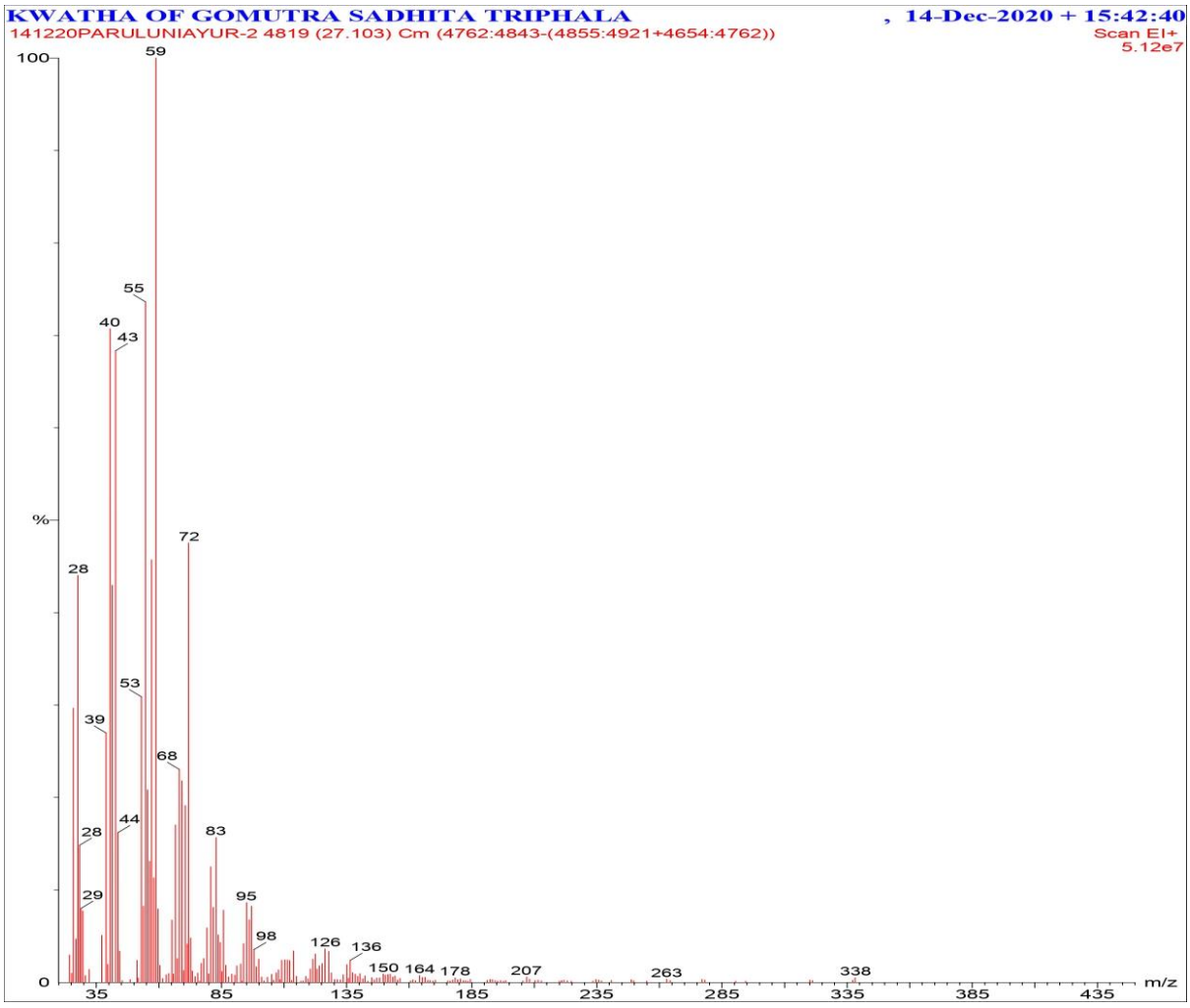


FIGURE-3

KWATHA OF GOMUTRA SADHITA TRIPHALA **141220PARULUNIAYUR-2**

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	876	661	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
2	839	629	13-DOCOSENAMIDE, (Z)-	337	C22H43ON	112-84-5
3	837	623	13-DOCOSENAMIDE, (Z)-	337	C22H43ON	112-84-5
4	833	597	9-OCTADECENAMIDE	281	C18H35ON	3322-62-1
5	829	680	8-METHYL-6-NONENAMIDE	169	C10H19ON	900293-20-9
6	824	573	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
7	805	542	NONADECANAMIDE	297	C19H39ON	58185-32-3
8	803	558	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
9	799	564	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
10	798	563	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
11	787	614	9-OCTADECENAMIDE	281	C18H35ON	3322-62-1
12	786	561	DODECANAMIDE	199	C12H25ON	1120-16-7
13	784	530	OCTADECANAMIDE	283	C18H37ON	124-26-5
14	767	538	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
15	766	548	N'-(4-NITROBENZYLIDENE)-2-PENTYL-1-CYCLOPROPANECARBOHYDRAZIDE	303	C16H21O3N3	339027-09-7
16	763	624	TRANS-3,4-EPOXYNONANE	142	C9H18O	56769-23-4
17	750	582	CITRONELLOL EPOXIDE (R OR S)	172	C10H20O2	900163-92-8
18	747	490	PENTADECANAMIDE, 15-BROMO-	319	C15H30ONBr	900163-86-1
19	737	606	OXETANE, 2,2,3-TRIMETHYL-	100	C6H12O	23120-43-6
20	735	502	BIS(CIS-13-DOCOSENAMIDO)METHANE	686	C45H86O2N2	10436-19-8

FIGURE NO: 4

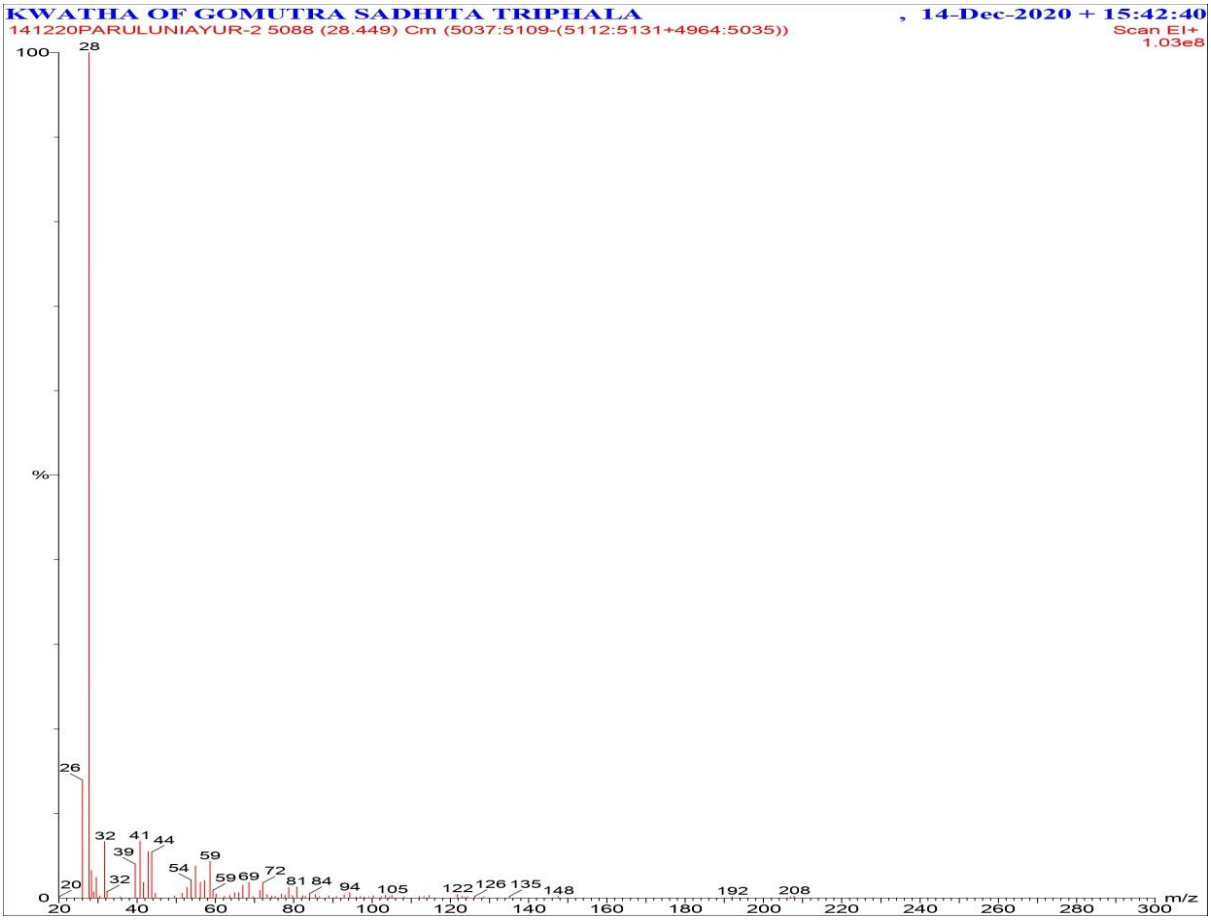
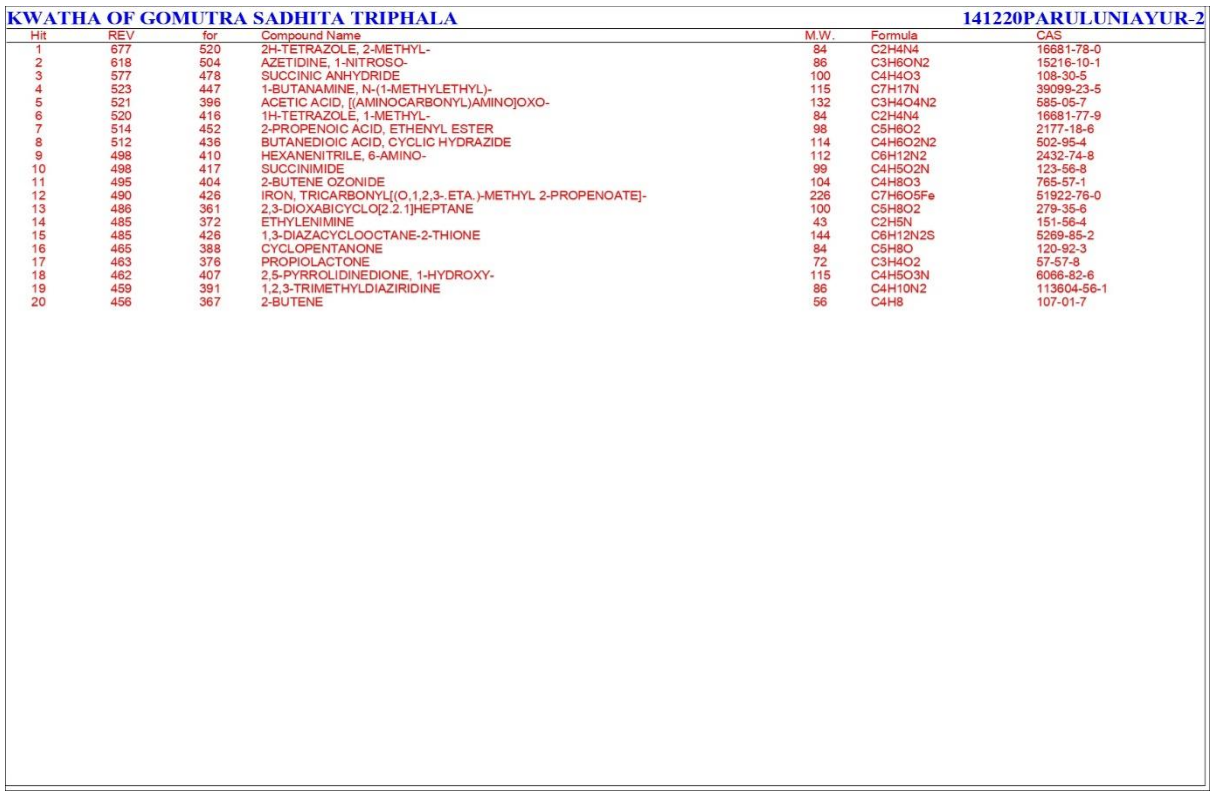


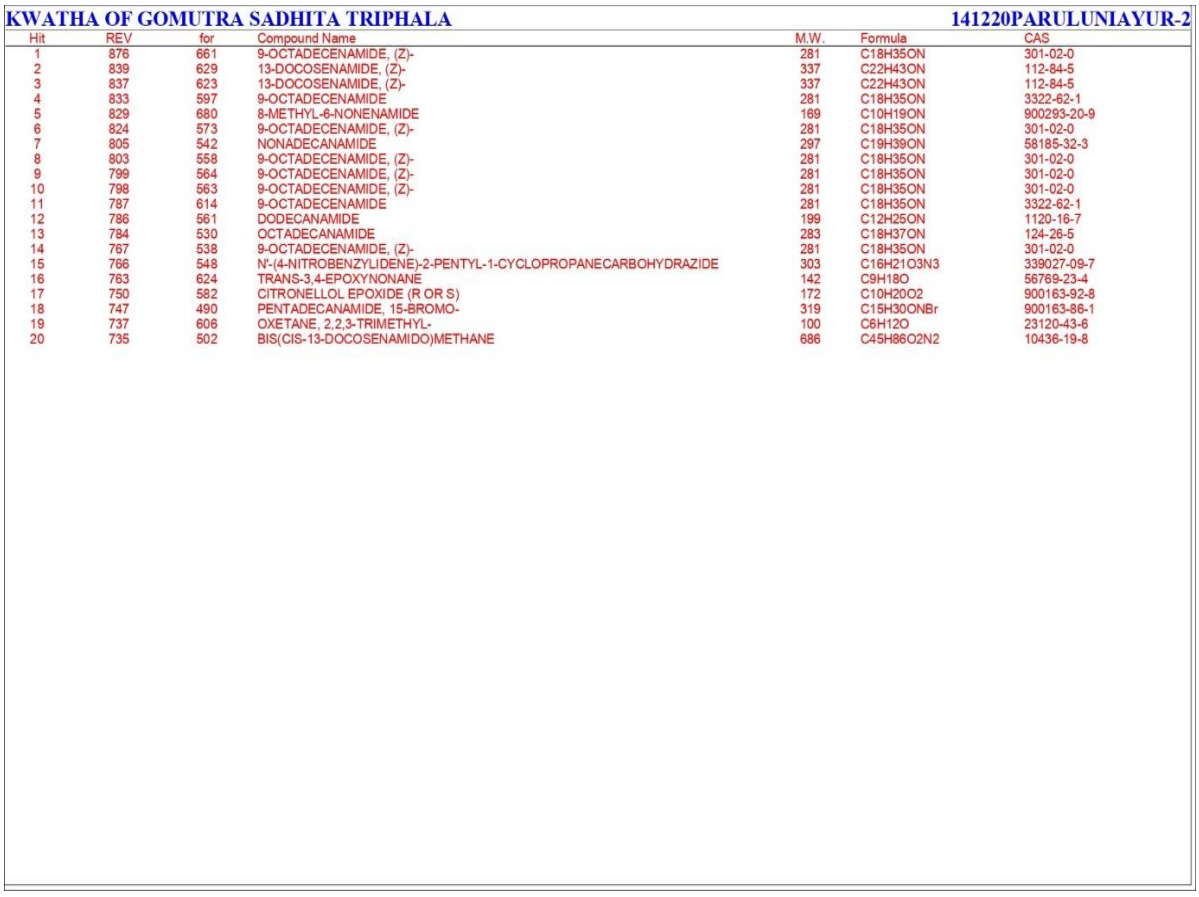
FIGURE NO: 5



KWATHA OF GOMUTRA SADHITA TRIPHALA **141220PARULUNIAYUR-2**

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	677	520	2H-TETRAZOLE, 2-METHYL-	84	C2H4N4	16681-78-0
2	618	504	AZETIDINE, 1-NITROSO-	86	C3H6ON2	15216-10-1
3	577	478	SUCCINIC ANHYDRIDE	100	C4H4O3	108-30-5
4	523	447	1-BUTANAMINE, N-(1-METHYLETHYL)-	115	C7H17N	39099-23-5
5	521	396	ACETIC ACID, [(AMINOCARBONYL)AMINO]OXO-	132	C3H4O4N2	585-05-7
6	520	416	1H-TETRAZOLE, 1-METHYL-	84	C2H4N4	16681-77-9
7	514	452	2-PROPENOIC ACID, ETHENYL ESTER	98	C5H6O2	2177-18-6
8	512	436	BUTANEDIOIC ACID, CYCLIC HYDRAZIDE	114	C4H6O2N2	502-95-4
9	498	410	HEXANENITRILE, 6-AMINO-	112	C6H12N2	2432-74-8
10	498	417	SUCCINIMIDE	99	C4H5O2N	123-56-8
11	495	404	2-BUTENE OZONIDE	104	C4H8O3	765-57-1
12	490	426	IRON, TRICARBONYL[(O,1,2,3-.ETA.)-METHYL 2-PROPENOATE]-	226	C7H6O5Fe	51922-76-0
13	486	361	2,3-DIOXABICYCLO[2.2.1]HEPTANE	100	C5H8O2	279-35-6
14	485	372	ETHYLENIMINE	43	C2H5N	151-56-4
15	485	426	1,3-DIAZACYCLOOCTANE-2-THIONE	144	C6H12N2S	5269-85-2
16	465	388	CYCLOPENTANONE	84	C5H8O	120-92-3
17	463	376	PROPIOLACTONE	72	C3H4O2	57-57-8
18	462	407	2,5-PYRROLIDINEDIONE, 1-HYDROXY-	115	C4H5O3N	6066-82-6
19	459	391	1,2,3-TRIMETHYLDIAZIRIDINE	86	C4H10N2	113604-56-1
20	456	367	2-BUTENE	56	C4H8	107-01-7

FIGURE NO 6:



KWATHA OF GOMUTRA SADHITA TRIPHALA **141220PARULUNIAYUR-2**

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	876	661	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
2	839	629	13-DOCOSENAMIDE, (Z)-	337	C22H43ON	112-84-5
3	837	623	13-DOCOSENAMIDE, (Z)-	337	C22H43ON	112-84-5
4	833	597	9-OCTADECENAMIDE	281	C18H35ON	3322-62-1
5	829	680	8-METHYL-6-NONENAMIDE	169	C10H19ON	900293-20-9
6	824	573	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
7	805	542	NONADECANAMIDE	297	C19H39ON	58185-32-3
8	803	558	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
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11	787	614	9-OCTADECENAMIDE	281	C18H35ON	3322-62-1
12	786	561	DODECANAMIDE	199	C12H25ON	1120-16-7
13	784	530	OCTADECANAMIDE	283	C18H37ON	124-26-5
14	767	538	9-OCTADECENAMIDE, (Z)-	281	C18H35ON	301-02-0
15	766	548	N'-(4-NITROBENZYLIDENE)-2-PENTYL-1-CYCLOPROPANECARBOHYDRAZIDE	303	C16H21O3N3	339027-09-7
16	763	624	TRANS-3,4-EPOXYNONANE	142	C9H18O	56769-23-4
17	750	582	CITRONELLOL EPOXIDE (R OR S)	172	C10H20O2	900163-92-8
18	747	490	PENTADECANAMIDE, 15-BROMO-	319	C15H30ONBr	900163-86-1
19	737	606	OXETANE, 2,2,3-TRIMETHYL-	100	C6H12O	23120-43-6
20	735	502	BIS(CIS-13-DOCOSENAMIDO)METHANE	686	C45H86O2N2	10436-19-8

FIGURE NO 7:

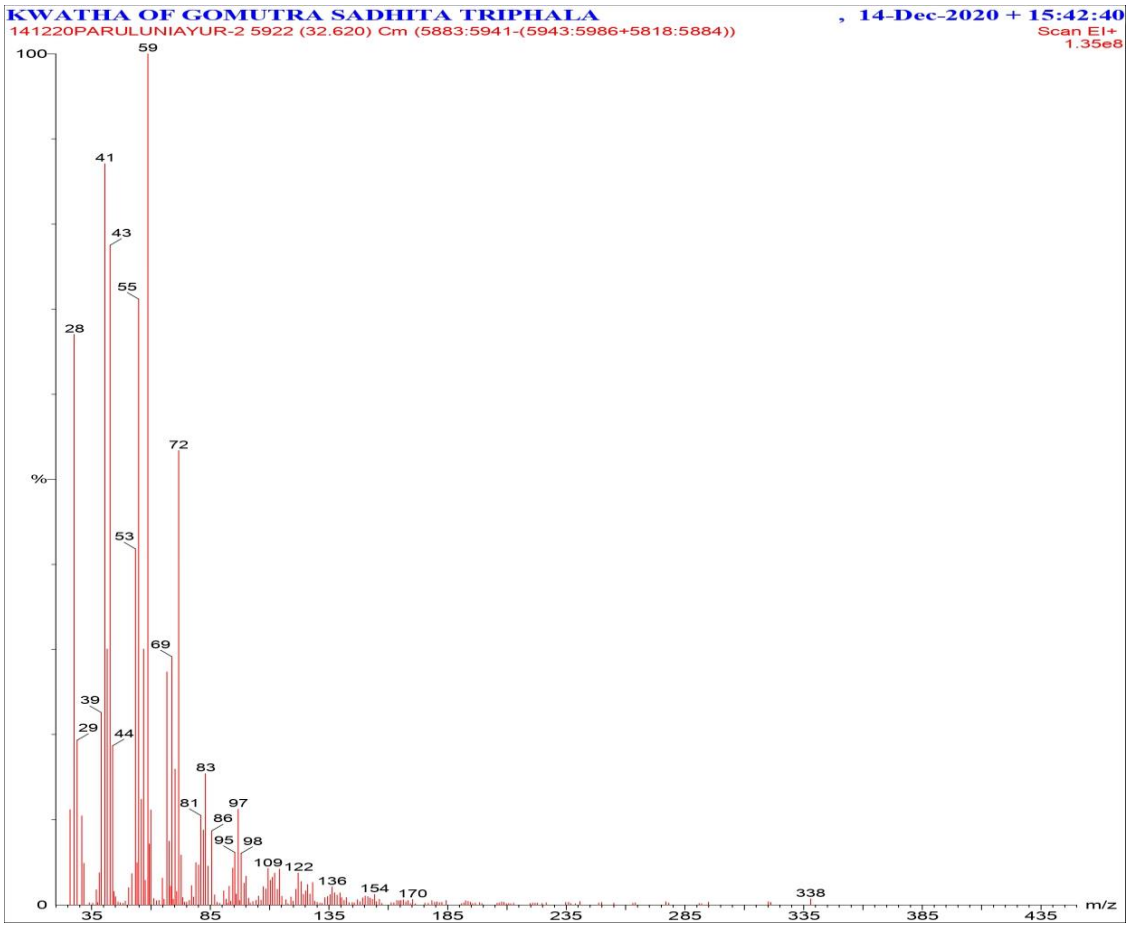

FIGURE NO 8:

GC-MS OF ARKA

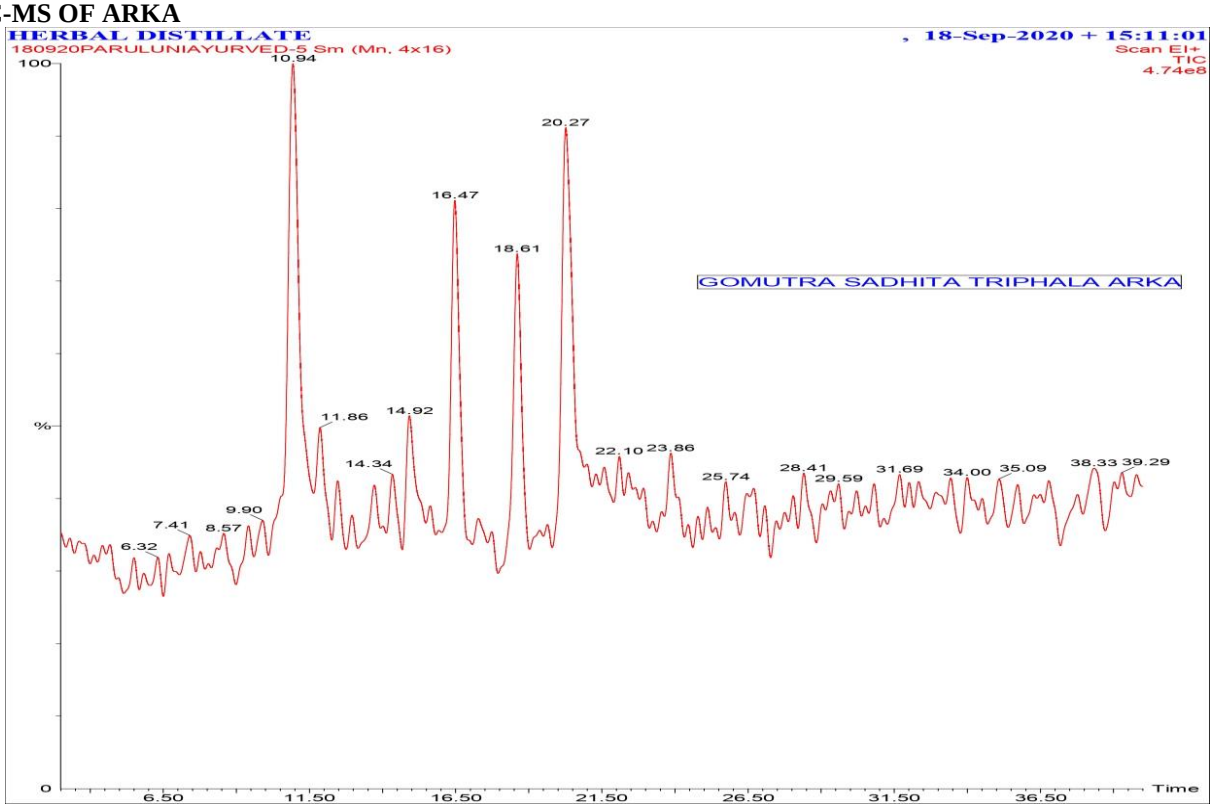

FIGURE NO 9:

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Printed : Saturday, September 19, 2020 11:26:08 AM

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1	1	10.937	130,712,192.0	298,577,184	MM	0.00		0.00	TIC	31.88
2	2	11.862	14,442,335.0	52,666,196	MM	0.00		0.00	TIC	3.52
3	3	14.919	27,864,182.0	81,944,056	MM	0.00		0.00	TIC	6.80
4	4	16.474	64,466,308.0	211,901,968	MM	0.00		0.00	TIC	15.72
5	5	18.610	63,381,280.0	196,033,248	MM	0.00		0.00	TIC	15.46
6	6	20.271	109,103,392.0	257,105,008	MM	0.00		0.00	TIC	26.61

Area percent report Saturday, September 19, 2020 11:26:08 AM Page 1

FIGURE NO 10:

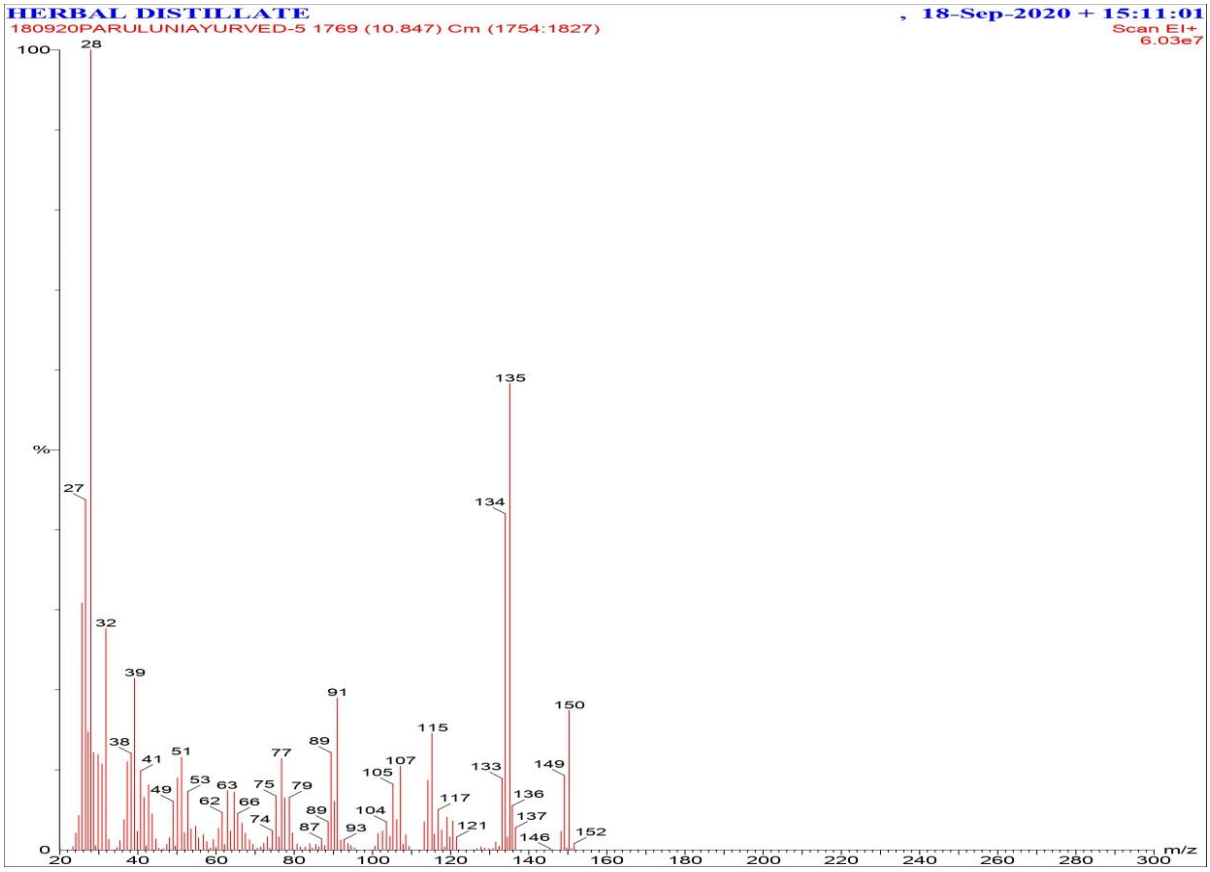


FIGURE NO 11:

HERBAL DISTILLATE **180920PARULUNIAYURVED-5**

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	800	366	BENZOIC ACID, 2-(2-ISOPROPYL-5-METHYLPHENOXYMETHYL)-	284	C18H20O3	900317-22-1
2	790	341	PHENOL, 2,3,5,6-TETRAMETHYL-	150	C10H14O	527-35-5
3	783	412	THYMOL	150	C10H14O	89-83-8
4	734	312	2H-1-BENZOPYRAN, 3,4-DIHYDRO-	134	C9H10O	493-08-3
5	720	357	BENZO[B]THIOPHENE, 2,3-DIHYDRO-3-METHYL-	150	C9H10S	6383-15-9
6	719	363	PHENOL, 2-METHYL-5-(1-METHYLETHYL)-	150	C10H14O	499-75-2
7	712	337	2-ALLYLPHENOL	134	C9H10O	1745-81-9
8	707	335	BENZOFURAN, 2,3-DIHYDRO-2-METHYL-	134	C9H10O	1746-11-8
9	691	379	BENZOFURAN, 2,3-DIHYDRO-2-METHYL-	134	C9H10O	1746-11-8
10	688	314	2H-1-BENZOPYRAN, 3,4-DIHYDRO-	134	C9H10O	493-08-3
11	643	316	PHENOL, 2-METHYL-5-(1-METHYLETHYL)-, ACETATE	192	C12H16O2	6380-28-5
12	635	300	N'-(4-METHYLSALICYLIDENE)MANDELOHYDRAZIDE	284	C16H16O3N2	328018-59-3
13	628	304	BENZALDEHYDE, 2-ETHYL-	134	C9H10O	22927-13-5
14	616	305	BENZENAMINE, 2,6-DIETHYL-	149	C10H15N	579-66-8
15	602	350	4-ETHYLBENZOIC ACID, ISOPROPYL ESTER	192	C12H16O2	900293-49-3
16	591	339	4-ETHYLBENZOIC ACID, ALLYL ESTER	190	C12H14O2	900293-31-7
17	590	375	1H-INDEN-1-ONE, 2-[[4-(DIMETHYLAMINO)PHENYL]METHYL]-2,3-DIHYDRO-	265	C18H19ON	900401-64-0
18	585	331	PHENOL, 5-METHYL-2-(1-METHYLETHYL)-, ACETATE	192	C12H16O2	528-79-0
19	538	325	HEXESTROL	270	C18H22O2	84-16-2
20	525	319	BENZENE, 2-METHOXY-4-METHYL-1-(1-METHYLETHYL)-	164	C11H16O	1076-56-8

FIGURE NO 12:

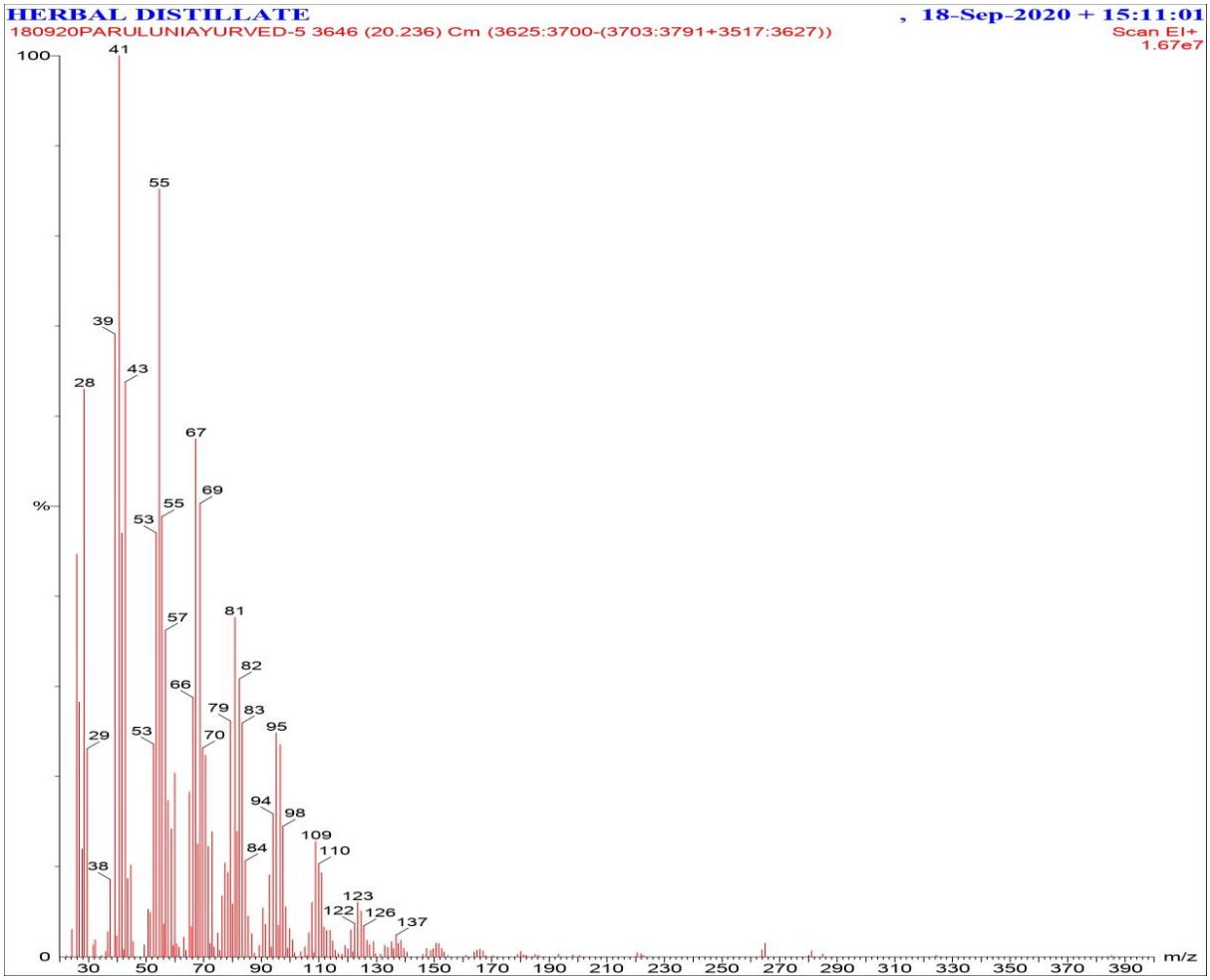


FIGURE NO 13:

HERBAL DISTILLATE **180920PARULUNIAYURVED-5**

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	809	551	CHLOROMETHYL 2-CHLORODECANOATE	254	C11H20O2Cl2	80418-79-7
2	807	388	2,6-PYRAZINEDIAMINE	110	C4H6N4	41536-80-5
3	804	486	1-BROMO-3-(2-BROMOETHYL)-NONANE	312	C11H22Br2	70928-49-3
4	798	534	4-CHLORO-3-N-HEXYLTETRAHYDROPYRAN	204	C11H21OCl	66555-66-6
5	787	562	Z-10-PENTADECEN-1-OL	226	C15H30O	900245-48-5
6	780	539	4-CHLORO-3-N-BUTYLTETRAHYDROPYRAN	176	C9H17OCl	35952-06-8
7	778	545	Z-1,9-HEXADECADIENE	222	C16H30	900245-71-3
8	776	557	2,4-PENTADIEN-1-OL, 3-PENTYL-, (2Z)-	154	C10H18O	900142-19-7
9	764	546	9-TETRADECEN-1-OL, ACETATE, (E)-	254	C16H30O2	23192-82-7
10	762	549	2,4-PENTADIEN-1-OL, 3-PROPYL-, (2Z)-	126	C8H14O	900142-17-9
11	761	534	CIS-7-TETRADECEN-1-OL	212	C14H28O	40642-43-1
12	760	531	E-1,9-HEXADECADIENE	222	C16H30	900245-71-4
13	756	540	E-10-PENTADECENOL	226	C15H30O	900245-48-4
14	755	506	2-ISOPROPYL-5-METHYLCYCLOHEXYLMETHANOL	170	C11H22O	900223-18-0
15	751	480	E-11-HEXADECENOIC ACID, ETHYL ESTER	282	C18H34O2	900245-71-9
16	749	525	E-7-TETRADECENOL	212	C14H28O	37011-95-3
17	749	516	Z-1,9-TETRADECADIENE	194	C14H26	900245-70-9
18	748	509	BICYCLO[3.1.1]HEPTAN-3-OL, 2,6,6-TRIMETHYL-, (1.ALPHA.,2.BETA.,3.ALPHA.,5.ALP	154	C10H18O	27779-29-9
19	748	524	2,4-PENTADIEN-1-OL, 3-ETHYL-, (2Z)-	112	C7H12O	900142-17-6
20	746	518	10-UNDECENAL	168	C11H20O	112-45-8

FIGURE NO 14:

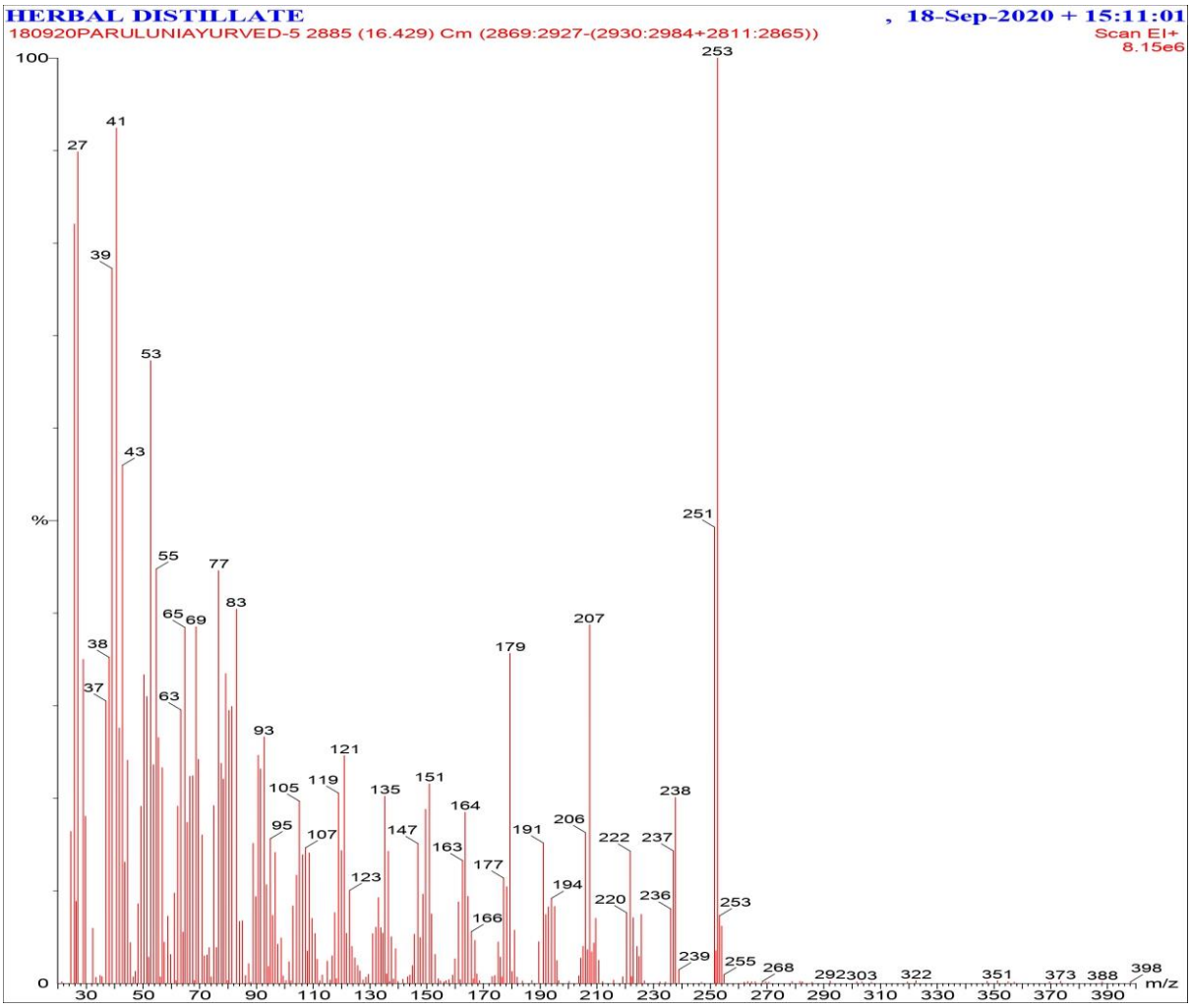


FIGURE NO 15:

HERBAL DISTILLATE 180920PARULUNIAYURVED-5

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	659	333	BENZ[E]AZULENE-3,8-DIONE, 3A,4,6A 7,9,10,10A,10B-OCTAHYDRO-3A,10A-DIHYDR	364	C20H28O6	77590-91-1
2	659	355	BENZ[E]AZULENE-3,8-DIONE, 5-[(ACETYLOXY)METHYL]-3A,4,6A,7,9,10,10A,10B-OCT	348	C19H24O6	25536-74-7
3	617	333	1-(2-ADAMANTYLIDENE)SEMICARBAZIDE	207	C11H17ON3	65814-27-9

FIGURE NO 16:

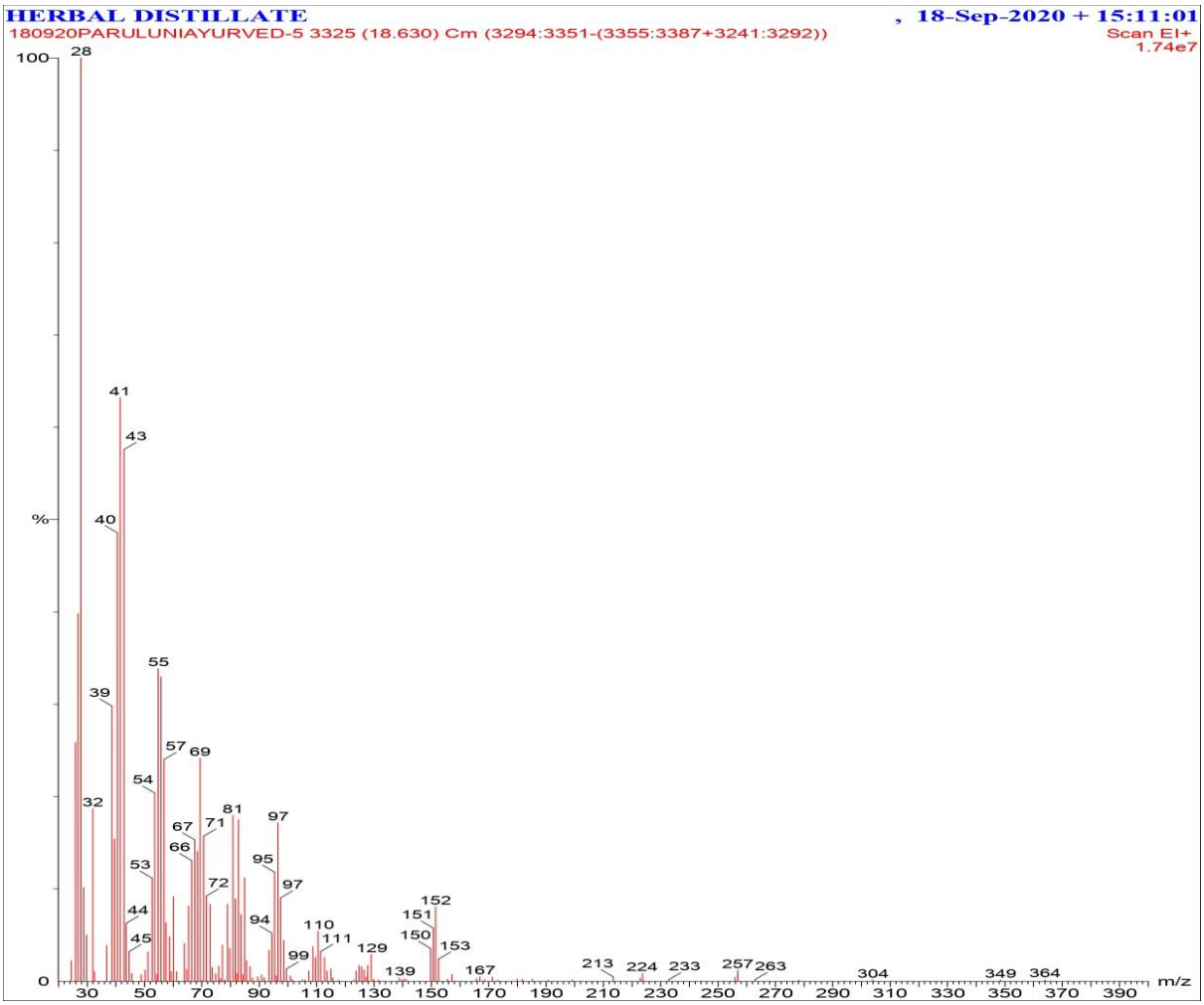
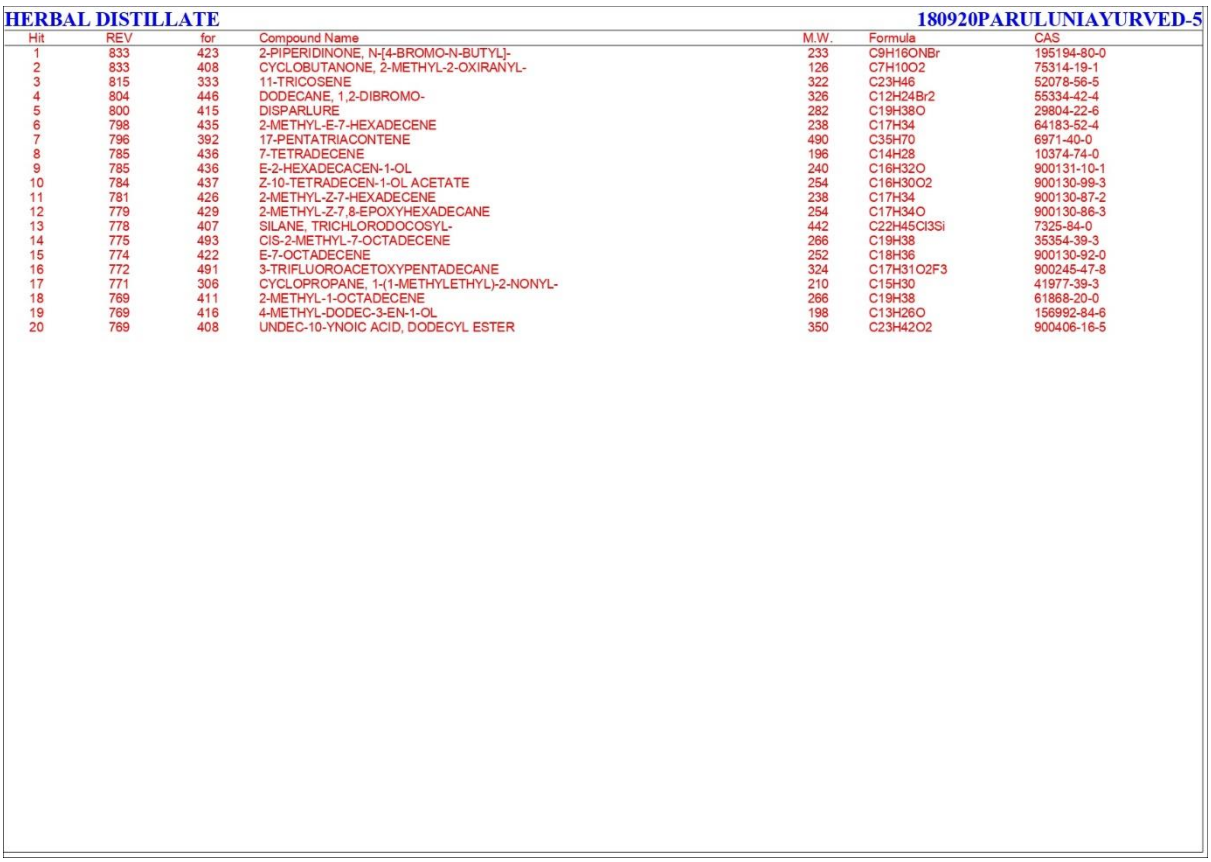


FIGURE NO 17:



HERBAL DISTILLATE 180920PARULUNIAYURVED-5

Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	833	423	2-PIPERIDINONE, N-[4-BROMO-N-BUTYL]-	233	C9H16ONBr	195194-80-0
2	833	408	CYCLOBUTANONE, 2-METHYL-2-OXIRANYL-	126	C7H10O2	75314-19-1
3	815	333	11-TRICOSENE	322	C23H46	52078-56-5
4	804	446	DODECANE, 1,2-DIBROMO-	326	C12H24Br2	55334-42-4
5	800	415	DISPARLURE	282	C19H38O	29804-22-6
6	798	435	2-METHYL-E-7-HEXADECENE	238	C17H34	64183-52-4
7	796	392	17-PENTATRIACONTENE	490	C35H70	6971-40-0
8	785	436	7-TETRADECENE	196	C14H28	10374-74-0
9	785	436	E-2-HEXADECACEN-1-OL	240	C16H32O	900131-10-1
10	784	437	Z-10-TETRADECEN-1-OL ACETATE	254	C16H30O2	900130-99-3
11	781	426	2-METHYL-Z-7-HEXADECENE	238	C17H34	900130-87-2
12	779	429	2-METHYL-Z-7,8-EPOXYHEXADECANE	254	C17H34O	900130-86-3
13	778	407	SILANE, TRICHLORODOCOSYL-	442	C22H45Cl3Si	7325-84-0
14	775	493	CIS-2-METHYL-7-OCTADECENE	266	C19H38	35354-39-3
15	774	422	E-7-OCTADECENE	252	C18H36	900130-92-0
16	772	491	3-TRIFLUOROACETOXYPENTADECANE	324	C17H31O2F3	900245-47-8
17	771	306	CYCLOPROPANE, 1-(1-METHYLETHYL)-2-NONYL-	210	C15H30	41977-39-3
18	769	411	2-METHYL-1-OCTADECENE	266	C19H38	61868-20-0
19	769	416	4-METHYL-DODEC-3-EN-1-OL	198	C13H26O	156992-84-6
20	769	408	UNDEC-10-YNOIC ACID, DODECYL ESTER	350	C23H42O2	900406-16-5

FIGURE NO 18:

DISCUSSION:

Gas Chromatography and mass spectroscopy is mainly used to detect and separate the volatile and thermally stable components of drugs. It was done for both *Kwatha* as well as *Arka*. In Gas Chromatography of *Kwatha*, three values of RT i.e.,27.013, 28.414, 32.575 were found that covers the 100% area. These three peaks were followed to run on mass spectroscopy for which 20 chemical compounds were found in each peak. The compound 9-octadecenamide is same for RT 32.575 and RT 27.103 and repeated 8 and 4 times respectively in both the RT. This compound has sedative effect (14). The compound dodecanamide is found which is fatty amide of lauric acid and has a role of metabolite. Octadecanamide is another compound having metabolite role (14). In RT 27.103 Octadecanamide and Dodecanamide were also obtained (14). In RT 28.449, compounds don't have any pharmacological use regarding inflammation.

In Gas Chromatography of *Arka*, six RT values i.e., 10.937, 11.862, 14.919, 16.474, 18.610, 20.271 were found. Four RT values out of six were run for mass spectroscopy because maximum area was covered by these four peaks. For 10.937, 18.619 and 20.271, twenty compounds for each were found. For 16.474. total three compounds were found. Thymol, Dihydrobenzo pyran, Carvacrol, Isothymol and Acetic acid compounds were found which are having Anti- inflammatory actions (14). In probable compound list, the anti-inflammatory action was not found in *Kwatha* whereas in *Arka* compounds having anti-inflammatory action were found. Whereas, Anti-inflammatory In-vitro study of *Gomutra sadhita triphala kwatha* (GTK), *Gomutra sadhita triphala Arka* (GTA) by protein denaturation inhibition method states that IC 50 value of *Kwatha* is less that *Arka*. Denaturation of proteins is the well documented cause of inflammation. The compounds that inhibit the denaturation of protein may be used as anti-inflammatory agents. Lower value of inhibition concentration shows stronger inhibition of *Kwatha* than *Arka*. (15)

CONCLUSION:

Present study reveals that both dosage forms GTK and GTA contains entirely different components. *Arka* contains more volatile compounds having Anti-inflammatory effect. on contrary the *Kwatha* has the components which can exert protein denaturation and thereby act as anti-inflammatory.

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