

## PHARMACEUTICAL AND ANALYTICAL STUDY ON ARKA (*CALOTROPIS PROCERA*) TAILA

<sup>1</sup>Dr Kiranpreet Thakur <sup>2</sup>Dr Sahil Pathania <sup>3</sup>Dr Neerja Thakur

<sup>1</sup>Assistant Professor, Department of Shalakyta Tantra, <sup>2</sup>Assistant Professor, Department of Rasa Shastra & Bhaishajya Kalpana, Guru Nanak Ayurvedic Medical College & Research Institute, Gopalpur, Ludhiana, Punjab <sup>3</sup>PG Scholar, Department of Rasa Shastra & Bhaishajya Kalpana, Parul Institute of Ayurveda, Parul University, Vadodara, Gujarat

### ABSTRACT

Skin diseases are the most common problem that occurring in today's era. There are various skin diseases mentioned in the Ayurveda classics. Vicharchika (Eczema) is one such skin disease which is mentioned under kushtha rogas (skin diseases). For the treatment of Vicharchika (eczema) various internal and external medications are given in the classics. Arka taila (*Calotropis Procera* processed oil) (*Calotropis Procera* processed oil) (*Calotropis Procera* processed oil) is one such formulation mentioned in the Sharangdhar Samhita Sneha prakran adhyaya (Medicated Oil & Ghee Chapter). It is mentioned in the disease like Pama (scabies), Vicharchika (eczema) etc. Arka taila (*Calotropis Procera* processed oil) (*Calotropis Procera* processed oil) (*Calotropis Procera* processed oil) is used as external medicament in skin diseases. So here Arka taila (*Calotropis Procera* processed oil) was prepared in this study and its analytical study was done mainly HPTLC and GC-MS analysis to check the probable list of volatile compounds present in the Arka taila (*Calotropis Procera* processed oil).

**KEYWORDS:** Arka taila, Sneha kalpana, GC-MS, Analytical Study, HPTLC of Arka

### INTRODUCTION

Sneha kalpana (medicated oil & ghee) (Medicated oil & ghee) is an integral part of the Ayurveda. Sneha kalpana (medicated oil & ghee) contains Ghrita kalpana and Taila Kalpana. In detail Sneha kalpana (medicated oil & ghee) is described in Sharangdhar Samhita Madhyama Khanda.<sup>1</sup> Taila kalpana describe about the detailed use of medicated oils in various diseases. Taila (Oil) is also considered as one part in the Chaturvidha snehas by different Ayurvedic texts like Charaka Samhita<sup>2</sup>, Ashtanga Hridaya<sup>3</sup>, Ashtanga Sangraha.<sup>4</sup> Sneha kalpana

(medicated oil & ghee) are mainly adopted to extract the active principles of plants and minerals into fatty media and to enhance and hasten the absorption of drugs in the body. In Skin diseases different types of medicated oils are given in ayurvedic texts. Arka taila (*Calotropis Procera* processed oil) is one such sneha kalpana (medicated oil & ghee) mentioned in Sharangdhar Samhita Madhyama Khanda<sup>5</sup> for the treatment of diseases like pama (Scabies), kandu (Itching), Vicharchika (Ezema). It contains Haridra Kalka (*Cucuma longa* bolus), Arka

patra swarasa (*Calotropis Procera* leaves fresh juice) and Sarshapa taila (Mustard oil) as its ingredients. By going through the properties of these drugs, it is suitable in the treatment of skin diseases. Before preparing the siddha taila (Processed oil) concept of sneha murchhana (Oil processing) is also mentioned. It was first mentioned in the Bhaishajya Ratnavali.<sup>6</sup> In the present study, Arka taila (*Calotropis Procera* processed oil) was prepared by the general rule mentioned in the Sharangdhara samhita<sup>7</sup> and subjected for different quantitative and qualitative analytical parameters like organoleptic study and iodine value, viscosity, saponification value, acid value, HPTLC.

## PHARMACEUTICAL STUDY

### Collection of Raw Materials:

For Arka taila (*Calotropis Procera* processed oil) preparation, raw materials Fresh Haridra (*Curcuma longa*) and Sarshapa taila (Mustard oil) were collected from local market Vadodara. Arka patra (*Calotropis Procera* leaves) for swarasa (fresh juice) was collected from the surroundings of Parul University. The raw drugs for the murchhana (Processing) of taila (oil) were also collected from the local market of Vadodara.

### Murchhana (Processing) of Sarshapa Taila (Mustard oil):

-The coarse powder of the kalka dravyas (bolus materials) was done.

-Sarshapa taila (Mustard oil) was taken in stainless steel vessel and placed over mild fire. After the appearance of fumes the bolus of kalka (bolus) prepared was added to sarshapa taila (Mustard oil).

-After which the required quantity of water was added to it.

-Heating was given with intermittent stirring till it was reduced to the quantity of oil.

-After that murchita oil (Processed oil) was filtered and taken in another vessel.

**Table No1:** Ingredients with Quantity for Murchana (Processing)

S. No	Ingredients	Botanical Name	Parts Used	Quantity
1	Sarshapa taila	<i>Brassica juncea</i>	Seed	20lts
2	Manjisht a	<i>Rubia cordifolia</i>	Root	2.5kg
3	Haridra	<i>Curcuma longa</i>	Rhizome	312.5g m
4	Musta	<i>Cyperus rotundus</i>	Rhizome	312.5g m
5	Haritaki	<i>Terminalia chebulica</i>	Dried fruit pericarp	312.5g m
6	Bilva	<i>Aegle marmelos</i>	Fruit pulp	312.5g m
7	Dadim	<i>Punica granatum</i>	Seed	312.5g m
8	Nagakesar	<i>Mesua ferrea</i>	Stamen	312.5g m
9	Krishna jeerak	<i>Carum carvi</i>	Fruit	312.5g m
10	Sugandh bala	<i>Valeriana wallichii</i>	Rhizome	312.5g m
11	Nilika	<i>Indigofera tinctorial</i>	Whole plant	312.5g m
12	Bibhitaki	<i>Terminalia belerica</i>	Dried fruit pericarp	312.5g m
13	Water	---	---	80lts

### Preparation of Arka taila (*Calotropis Procera* processed oil):

-Swarasa (Fresh juice) of Arka patra (*Calotropis Procera* leaves) was collected by crushing all the patras (leaves) and squeezing it.

-Fresh haridra (*Curcuma longa*) was made into kalka (bolus) form by adding sufficient amount of water.

-In iron vessel, Murchita Sarshapa taila (Mustard oil) was kept on mild fire and when it was hot enough required quantity of haridra kalka (*Curcuma longa* bolus) was added to the murchit taila (Processed oil).

-After the addition of kalka (bolus), Arka patra swarasa (*Calotropis Procera* leaves fresh juice) was added to taila and cooking of oil was started by continuing stirring.

-Taila (oil) for prepared for 3days till all the sneha sidhi lakshanas (Signs of processed oil) was observed for the madhyama paka (Medium cooking).

-After that the oil was filtered and stored in the air tight bottles.

**Table No 2: Ingredients with quantity**

S. No.	Ingredients	Latin/English Name	Part Use	Quantity
1.	Haridra kalka	<i>Curcuma longa</i>	Rhizome	4.75kg
2.	Arka patra Swarasa	<i>Calotropis Procera</i>	Leaves	76litres
3.	Murchita Sarshapa taila	Mustard oil	-	19litres

Final quantity of Arka taila (*Calotropis Procera* processed oil) received: 18litres.

## RESULT

### Analytical Study:

**Table No 3: Organoleptic characters:**

PARAMETERS	ARKA TAILA ( <i>Calotropis procera</i> Processed oil)
Color	Greenish yellow
Odour	Slightly aromatic
Taste	Slight astringent
Consistency	Liquid (Oily)
Touch	Unctuous

**Table No 4: Physico-Chemical Parameters:**

S.N o.	PARAMETER	ARKA TAILA ( <i>Calotropis procera</i> PROCESSED OIL)
1.	Specific Gravity	0.9444
2.	Refractive index	1.4517
3.	Viscosity (cP)	62.488
4.	Iodine value	9.11
5.	Saponification value	277.69
6.	Rancidity	-ve
7.	Acid value	0.11

**Table No 5: Phytochemical Parameters:**

Sr.No.	Natural Product Group	Arka taila ( <i>Calotropis procera</i> processed oil)
1.	Alkaloids	+
2.	Tannins	-
3.	Saponins	+
4.	Flavanoids	+

### HPTLC of Arka taila (*Calotropis Procera* processed oil)

HPTLC of Arka taila (*Calotropis Procera* processed oil) was carried out at Vasu Research Centre Vadodara, Gujarat.

Preparation of test solution: Take 0.1mL of sample in a test tube and dilute it with 1mL of Hexane. Mix well. Use the test solution thus obtained for HPTLC fingerprinting.

Preparation of Spray reagent (5% Sulphuric acid in Methanol reagent): 5mL Sulphuric acid is cautiously mixed with 100mL Methanol.

Application Mode:	CAMAG Linomat 5-Applicator
Filtering System:	Whatman filter paper No.1
Stationary Phase:	MERCK-

	TLC/HPTLC Silica gel 60 F254 on Aluminum sheets
Application (Yaxis) Start Position:	10mm
Development End Position:	80mm from plate base
Sample Application Volume:	10 $\mu$ L
Distance Between Tracks:	0.0mm
Development Mode:	CAMAG TLC Twin Trough Chamber Chamber
Saturation Time:	30minutes
Mobile Phase (MP):	Petroleum ether : Diethyl ether : Acetic Acid (9:1:0.1v/v)
Pre-chromatographic derivatization:	After sample spotting pre-chromatographic derivatization done with 5% Alcoholic KOH (2.0 $\mu$ L) followed by heating the plate for 10minutes on TLC Plate Heater Preheated at 100 $\pm$ 5 <sup>0</sup> C
Visualization:	@254nm, @366nm and @540nm (after derivatization) Spray
Reagent:	5% Sulphuric acid in Methanol
Derivatization mode:	CAMAG-Dip tank for about 1minute
Drying Mode, Temp & Time:	TLC Plate Heater Preheated at 100 $\pm$ 5 <sup>0</sup> C for 3miutes

### GC-MS of Arka taila (*Calotropis Procera* processed oil)

The GC-MS of Arka taila (*Calotropis Procera* processed oil) was carried out at Sophisticated Instrumentation Centre for Applied Research and Testing (SICART) Anand, Gujarat.

**Method:** Solvent used for extraction was Hexane. GC-MS model: Perkin Elmer AUTO 6M TURBOMASS. Sample injected at 250<sup>0</sup> C, Oven temp: 75<sup>0</sup>C. Hold for 5minute at the rate of 10<sup>0</sup>C/min upto 270<sup>0</sup>C/min. then holded for 10minutes. Capillary column: PE-5AP. Length of Column: 30 meters, ID- 0.250 microns, thickness- 0.25mm, Injector temperature: 250<sup>0</sup>C. EI source temperature: 220<sup>0</sup>C, Mass range: 20-610AMU. Carrier Gas: Helium gas.

### DISCUSSION

Arka taila (*Calotropis Procera* processed oil) prepared here was taken from the reference of Sharanghar Samhita. Before the preparation of Arka taila (*Calotropis Procera* processed oil) . Murchana (Processing) of Sarshap taila was done. Primary intention of performing sneha Murchana (Processing) is to remove amadosha from raw sneha and to enhance drug absorption of sneha. Sneha also attains good odour, turns lighter for digestion. Specific group of plant materials used in the Murchana (Processing) process perhaps alter the chemical bonding of sneha dravya (oil or ghee material) which indirectly helps in extraction of active principles into sneha (oil or ghee) medium. After the Murchana (Processing) (processing) procedure, Arka taila (*Calotropis Procera* processed oil) preparation was done. For the preparation of Arka taila (*Calotropis Procera* processed oil), Arka patra Swarasa (*Calotropis Procera* leaves fresh juice) was used. Arka patra (*Calotropis Procera* leaves) was

collected from nearby surroundings of Parul University, Vadodara, Gujarat. For the kalka(bolus) formation fresh Haridra (*Curcuma longa*) was collected from the vegetable market in Vadodara city. Madhyama paka (medium cooked) of Sneha (oil or ghee) was done.

Viscosity is the resistance of flow of liquid. The slow the liquid will flow the absorbance will be more in the skin. So the viscosity of Arka taila (*Calotropis Procera* processed oil) is

62.488.8 Saponification value shows the long chains or short chains of fatty acids present in

the oil. Higher the molecular weight of the fat the smaller is its saponification value and vice versa. 277.69 is the saponification value of Arka taila (*Calotropis Procera* processed oil) which indicates the presence of higher content of low molecular weight fatty acids. These low molecular weight fatty acids gets easily and quickly absorbed into the body system.<sup>9</sup> Iodine value is done to determine the amount of unsaturation present in fatty acids. The higher the iodine value the more unsaturated fatty acids bonds are present in fat. Lesser value indicates that it is less vulnerable to lipid peroxidation (Rancidity). Arka taila (*Calotropis Procera* processed oil) is having 9.11 value. Iodine value is used as parameter in process control as well as quality parameter in oil products.<sup>10</sup> Acid value is a measure of free fatty acid present in fat or oil. Less value indicates less percentage of free fatty acids means stable nature of fatty acids which indicates prolonged shelf life. Acid value of Arka is 0.11 which can be considered as low value.<sup>11</sup>

Alkaloids and Flavanoids are having the anti-oxidant anti-inflammatory properties in

them.<sup>12</sup> Saponins also show their anti-inflammatory properties.<sup>13</sup>

HPTLC of Arka taila (*Calotropis Procera* processed oil) was seen at three different wavelengths. At 254 nm, 10 spots were found. At 366nm, 9 spots were found. At 540nm, 8 spots were found. On observing the Rf values, it is seen that first four values are common in all the the three wavelengths.

GC-MS of Arka taila (*Calotropis Procera* processed oil), only one peak was found at RT 23.01 which covered 100% area. In mass spectroscopy of this RT total of 20 compounds were found in which some compounds have the effects on the skin.

**Table No 6: Compounds found with their properties<sup>14</sup>**

S.NO.	Compound Name	Uses
1.	9-Octadecenoic acid, methyl ester	Used in skin lotions
2.	Isopropyl linoleate	Skin conditioning, emollient
3.	Linoelaidic acid	It is an omega -6 Fatty acid and is used in the biosynthesis of cell membranes
4.	Cis-13,16-Docasadienoic acid	Fatty acid and play role of metabolite
5.	Methyl linoleate	Methyl ester of linoleic acid and has emollient effect

These probable compounds may be the major component of this formulation as they are covering the major area on RT.

### CONCLUSION

From this study it can be concluded that, analytical parameters shows that it has stable nature. Phytochemical parameters show the



result that it can be used in Skin ailments. GC-MS probable list compounds compounds are also having the effect on skin. So from this it can be concluded that Arka taila (*Calotropis Procera* processed oil) is an efficacious medicine and can be used in the management of skin diseases.

## REFERENCES

1. Sharangdhar Samhita by Prof. K.R. Srikantha Murthy, Reprint Edition 2017, Chaukhambha Orientalia Varanasi, Chapter 9, Page no. 115
2. Charak Samhita by K. Sharma, Bhagvan Das, Print 2016, Choukhambha Sanskrit Series Varanasi, Volume 1, Sutrasthan, Chapter 13, Page no. 247, Shlok no. 13
3. Sarvangasundari Vyakhya Vibhushitam Ashtangahrudiyam by Shri Lalchand Vaidya, Print 2014, Motilal Banarasidas Varanasi, Sutrasthan, Chapter 16, Page no. 124
4. Ashtanga Sangraha by Ravidatta Tripathi, Print 2015, Choukhambha Sanskrit Pratisthan Delhi, Sutrasthan, Chapter 25, Page no. 446
5. Sharangdhar Samhita by Prof. K.R. Srikantha Murthy, Reprint Edition 2017, Chaukhambha Orientalia Varanasi, Chapter 9, Page no. 129, Shlok no. 147
6. Kaviraj Govind Das Sen, Bhaishajya Ratnavali, by Prof. Sidhi Nandan Mishra, Print 2016, Chaukhambha Surabharati Prakashan Varanasi, Chapter 5, Page no. 207, Shlok no. 1269- 1270
7. Sharangdhar Samhita by Prof. K.R. Srikantha Murthy, Reprint Edition 2017, Chaukhambha Orientalia Varanasi, Chapter 9, Page no. 124, Shlok no.93-98
8. Quality Control & Standardization of Ayurvedic Medicines by Dr Devendra Joshi & Dr Geeta Joshi, First Edition 2016, Chaukhambha Orientalia Varanasi, Chapter

4, Page no. 175

9. Quality Control & Standardization of Ayurvedic Medicines by Dr Devendra Joshi & Dr Geeta Joshi, First Edition 2016, Chaukhambha Orientalia Varanasi, Chapter 4, Page no. 177

10. Quality Control & Standardization of Ayurvedic Medicines by Dr Devendra Joshi & Dr Geeta Joshi, First Edition 2016, Chaukhambha Orientalia Varanasi, Chapter 4, Page no. 177

11. Quality Control & Standardization of Ayurvedic Medicines by Dr Devendra Joshi & Dr Geeta Joshi, First Edition 2016, Chaukhambha Orientalia Varanasi, Chapter 4, Page no. 178

12. Augusto Lopes Souto et al, Anti-Inflammatory Activity of Alkaloids: An Update from 2000 to 2010, Molecules MDPI, October 2011

13.

<https://doi.org/10.1016/j.sajb.2008.01.00915.05.2021>, 11:40AM

14. [www.Pubchem.ncbi.nlm.nih.gov](http://www.Pubchem.ncbi.nlm.nih.gov) 15.05.2021, 11:10AM

## CORRESPONDING AUTHOR

Dr Kiranpreet Thakur

Assistant Professor, Department of Shalakyia Tantra, Guru Nanak Ayurvedic Medical College & Research Institute, Gopalpur, Ludhiana, Punjab, India

Email: kinuthakur23@gmail.com

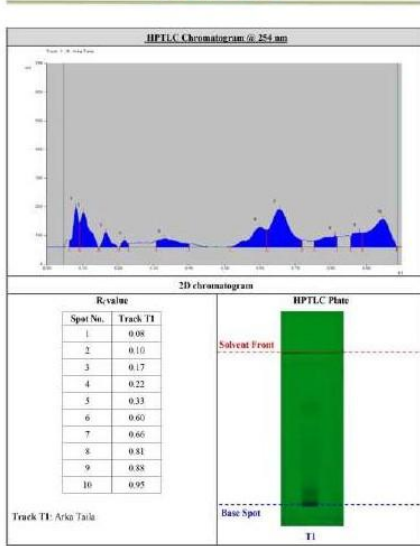
Source of support: Nil

Conflict of interest: None Declared

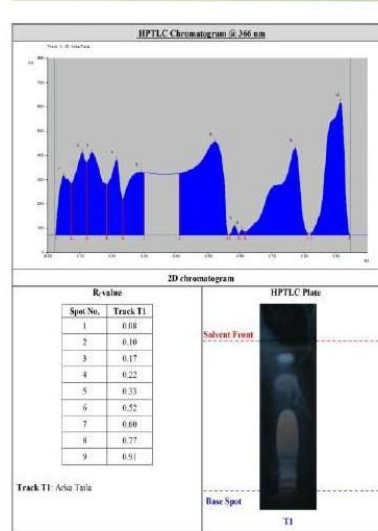
## Cite this article as

Dr Kiranpreet Thakur: Pharmaceutical and Analytical Study on Arka (*Calotropis Procera*) Taila ; VII(5): 2202-2210

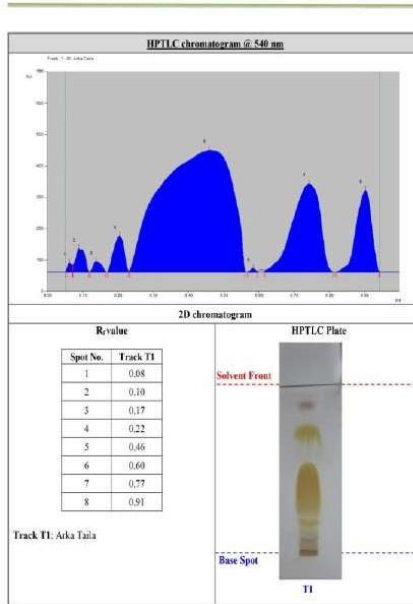
VASU



VASU



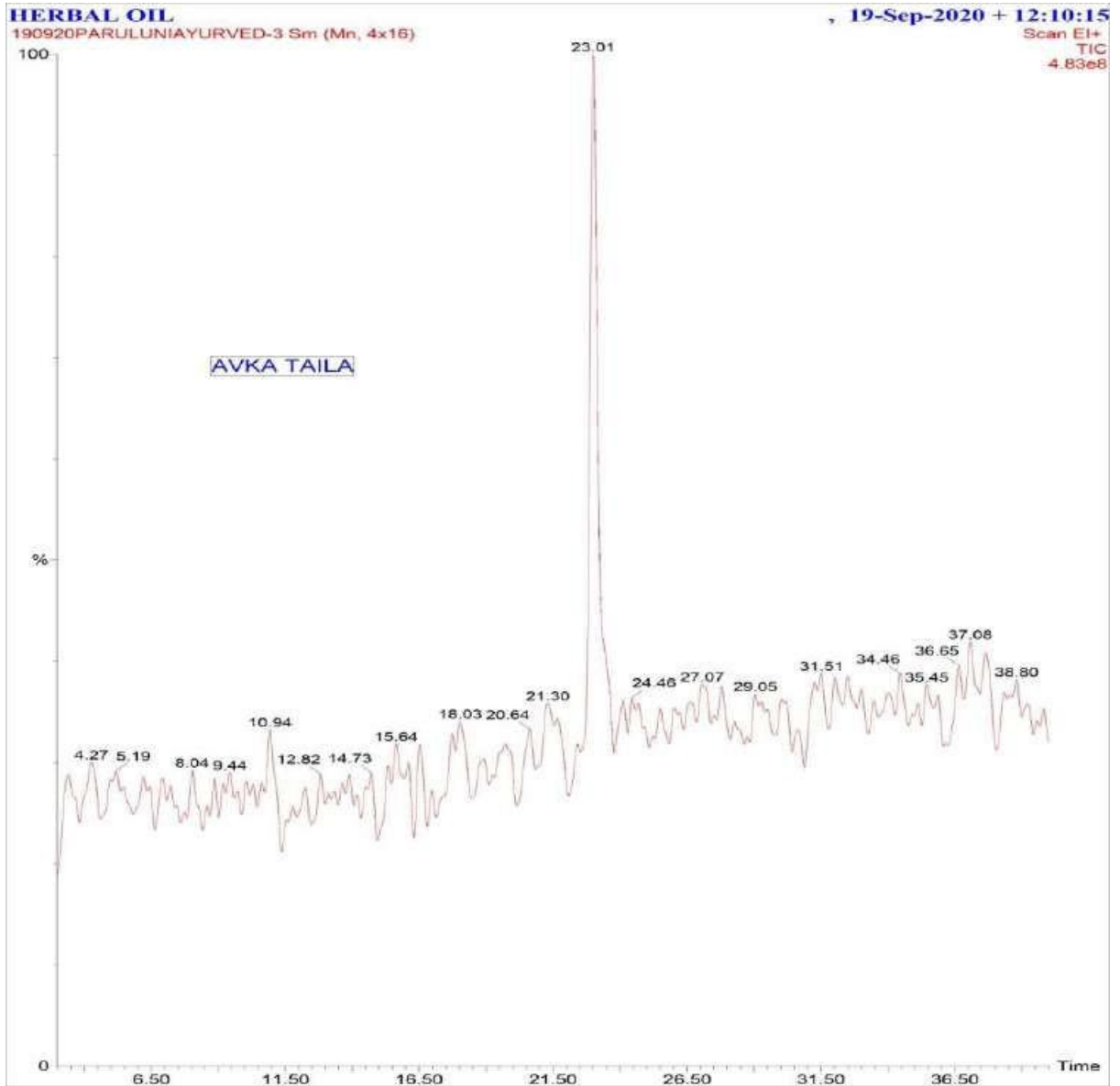
VASU



### Area Percent Report

Peak List File : D:\GCMS1\SICART2013.PRO\PeakDB\190920APARULUNIAY1  
 Last Modified : Saturday, September 19, 2020 1:47:20 PM  
 Printed : Saturday, September 19, 2020 1:47:30 PM

#	Name	RT	Area	Height	BL	Conc	Units	Area/Conc	m/z	Area %
1	1	23.011	120,596,096.0	332,351,360	MM	0.00		0.00	TIC	100.00





HERBAL OIL				190920PARULUNIAYURVED-3		
Hit	REV	for	Compound Name	M.W.	Formula	CAS
1	858	607	8-HEPTADECYNE 1-BROMO-	314	C17H31Br	56599-94-1
2	853	602	1,9-NONANEDIOL, DIMETHANESULFONATE	316	C11H24O6S2	4248-77-5
3	846	568	9,12-OCTADECADIENYL CHLORIDE, (Z,Z)-	298	C18H31Cl	7459-33-6
4	846	557	9,12-OCTADECADIEN-1-OL, (Z,Z)-	266	C18H34O	506-43-4
5	846	588	9-OCTADECYNE	290	C18H34	35365-59-4
6	842	613	2-OCTYLCHLOROPROPENE-1-HEPTANOL	266	C18H34O	54467-85-5
7	840	464	9,15-OCTADECADIENOIC ACID, METHYL ESTER, (Z,Z)-	294	C19H34O2	17309-05-6
8	840	547	9-OCTADECYNOIC ACID	280	C18H32O2	506-24-1
9	839	525	9,12-OCTADECADIENOIC ACID, METHYL ESTER, (E,E)-	294	C18H34O2	2566-07-4
10	829	530	9,17-OCTADECADIENAL, (Z)-	284	C18H32O	56554-35-9
11	825	575	13-TETRADEC-11-YN-1-OL	206	C14H24O	900131-00-4
12	824	506	LINOELAIDIC ACID	280	C18H32O2	506-21-8
13	820	496	9,12-OCTADECADIENOIC ACID, METHYL ESTER	294	C18H34O2	2462-65-3
14	816	546	9,12-OCTADECADIENOIC ACID, METHYL ESTER, (E,E)-	294	C18H34O2	2566-07-4
15	816	543	7,11-HEXADECADIENAL	236	C16H28O	900130-85-7
16	815	637	1-DODECYNE	168	C12H22	765-03-7
17	815	521	CIS-13,16-DOCASADIENOIC ACID	336	C22H40O2	7370-49-2
18	815	573	ERYTHRO-(Z)(1,4) [E](1,4')-4,4'-DIHYDROXYBICYCLOOCTYL	254	C16H30O2	900154-12-9
19	810	500	ISOPROPYL LINOLEATE	322	C21H38O2	22882-95-7
20	809	513	9-OCTADECYNOIC ACID, METHYL ESTER	294	C18H34O2	1120-32-7

