



PHYTOCHEMICAL AND CHROMATOGRAPHICAL EVALUATION OF *MADANPHALA* (*RANDIA DUMETORUM* LAMK.) FROM DIFFERENT *DESHA* BASED ON *AKASHADI PANCHAMAHABHOOTA*
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Submitted on- 16-02-24

Revised on- 14-03-24

Accepted on-18-03-24

ABSTRACT:

Background: *Madanaphala* is the best *vamana dravya* (emetic drug). As per classics the best place to collect these *vamana dravya* is the land which is predominant of the *Agni* (fire), *Vayu* (air) and *Akash* (ether) *mahabhoota*. In this study we are going to evaluate the phytochemical and chromatographical qualities of the *Madanaphala* collected from *Jangaladesha* (dry land) that is *Kappatagudda* which is the ideal collection area mentioned by *Acharya's* for *vamana karma* and the *Madanaphala* collected from the *Anupadesha* (marshy land) that is *Jamboti*. **Objectives:** Evaluation of phytochemical and chromatographical constitution of *Madanaphala*, collected from different *desha* (land) based on *Akashadi mahabhoota* (ether etc., elements). **Methodology:** 2 samples of *Madanaphala*, collected from the two different *desha's*, one sample collected from *Kappatagudda* region and the other sample collected from *Jamboti* region. The collected fruits are dried, cleaned, powdered and were analyzed for phytochemical and chromatographical evaluation. **Conclusion:** The phytochemical analysis of *Madanaphala* collected from two different region *Kappatagudda* and *Jamboti* didn't show any changes. TLC of both the samples showed the presence of phytochemicals at different *Rf* values but the sample collected from *Kappatagudda* has more number of *Rf* values which indicate presence of more number of phytochemicals than in *Madanaphala* collected from *Jamboti*. The standard *Rf* value of *Oleanolic acid* is 0.57. In the *HTPLC* result the nearest *Rf* value observed was 0.51 which is found in the *Madanaphala* collected from *Kappatagudda*, but no nearest *Rf* value was observed in *Madanaphala* collected from *Jamboti*. So we can justify the reference which is explained by our *Acharya Sushruta* in the context of *Bhumipravibhagiyamadyaya* that *vamana dravya* should be collected from *desha* predominant of *Akash*, *Vayu* and *Agni mahabhoota*. As our study also showed that *Madanaphala* collected from *Kappatagudda* region which is predominant of *Agni*, *Vayu* and *Akash mahabhoota* predominant is of superior quality than the *Madanaphala* collected from *Jamboti* region having *Parthiva(earth)* and *Aap(water) mahabhoota*.

Key Words: *Madanaphala*, Phytochemical, Chromatographical, *Desha*

INTRODUCTION:

In Indian system of medicine *Madanaphala* (*Randia dumetorum* Lamk) family Rubiaceae is an important medicinal plant popularly known as emetic nut. It is found in waste places & jungles all over India, extending northwest to the Bias River & ascending to outer Himalaya to 4000 ft. [1].

Fruit globose or broadly ovoid, 1.8-4.5cm long, crowned with persistent calyx-limb, longitudinally ribbed or smooth yellowish-brown, fruit contains numerous seeds, 0.4-0.6 cm long, very hard, brown, smooth and compressed. Fruit is bitter & sweet, carminative, purgative, aphrodisiac, emetic, antipyretic. It cures abscess, ulcers, inflammation, wounds, tumors, skin diseases and have anti-bacterial activity. The pulp of fruit is believed by many practitioners to also have anthelmintic properties, and also used as an abortifacient as folklore remedy [2].

The bark is astringent and is given in cases of diarrhea and dysentery. It is applied externally in the form of paste in rheumatism and to relieve pain of bruises and bone aches during fevers and to disperse abscesses and used internally. The aqueous extract of the root bark of the tree is used as an active insecticide [3].

Madanaphala fruits are considered as the *agrya* (superior) *dravya* for *vamana karma* [4]. They are considered as *agrya* as they are free

from complications and adverse side effect^[5]. This *Vamana karma* is the process by which *Apakva Kapha* (unripen *kapha*) and *Pitta* are expelled out forcefully through *Urdhwa bhaga*^[6] (upper clavicular region). *Vamana dravya* should be collected from soil which possesses the qualities of *Agni*, *Vayu* and *Akasha mahabhoota* [7]. So *Madanaphala* should be collected from the soil predominant of *Agni*, *Vayu* and *Akasha mahabhoota*. The qualities of these *Agni*, *Vayu* and *Akasha mahabhoota* is mostly found in *Jangala desha* [8,9,10].

In this study we are going to evaluate the phytochemical and chromatographical qualities of the *Madanaphala* collected from *Jangala desha* which is the ideal collection area mentioned by Acharya's for *vamana karma* and the *Madanaphala* collected from the *Anupa desha*. Here we have selected Kappatagudda for *Jangaladesha* and Jamboti (near Belagavi) which belongs to *Anupa desha*.

AIM & OBJECTIVE:-

- Evaluation of phytochemical and chromatographical constitution of *Madanaphala*, collected from different *desha* based on *Akashadi mahabhoota*.

MATERIALS AND METHODS:-

Plant materials:- 2 Samples of *Madanaphala* fruits are collected. One sample is collected from the Kappatagudda region which belongs to *Jangaladesha* that is predominant of *Agni*,

Vayu and *Akash Mahabhoota* and the another sample is collected from the Jamboti region which belongs to *Anupadesha* that is predominant of *Pruthvi* and *Aap Mahabhoota*. The *Madanaphala* fruits were got identified and authenticated at AYUSH approved Central Research Facility at Shri B.M.K Ayurveda Mahavidyalaya and PG centre, Shahapur, Belagavi and voucher number (CRF/Auth/74/2023) and (CRF/Auth/75/2023) of the drugs was given in Central Research Facility.

Churna preparation:-For testing purpose *Madanaphala* fruits are made into *churna* (powder). Here *Madanaphala* fruits *churna* is prepared by using Pulveriser and sieved through fine clean sieve in our college KAMCH RSBK Pharmacy.

Physico-chemical Phyto-chemical Screening and TLC test: Physico-chemical, Preliminary Phyto-chemical screening and TLC test was done at Central research facility, KLEU'S Shri BMK Ayurveda Mahavidyalaya, Belgaum, Karnataka.

HPTLC test:-Ethanollic extract of *Madanaphala* from Kappatagudda and Jamboti has been sent to SDM centre for research in Ayurveda and allied sciences, Udupi, Karnataka.

Method :-

100mg of each Ethanollic extract of *Madanaphala* from Kappatagudda and Ethanollic extract of *Madanaphala* from

Jamboti was dissolved in 100µl of ethanol. On a pre-coated silica gel F2544 and 8µl of each of the above extract was applied on aluminum plates to a band width of 7mm using Linomat 5 TLC applicator. The plate was developed under Toluene : Ethyl acetate : Formic acid (7.0 : 3.0: 0.3). The developed plates were visualised in short UV, long UV, White light after derivatization with Anisaldehyde sulphuric acid reagent. Developed plate was scanned at 254nm and 530nm (After derivatization with ASA reagent). Rf, colour of the spots, densitometry scan was recorded.

RESULTS

Results described under following headings

1. Pharmacognostic results
2. Analytical results
3. Experimental result

1) Pharmacognostic results:

A) Macroscopic evaluation of *Madanaphala*:-

- ***Madanaphala* {fruit} of Kappatagudda region:-**

More or less globose, dark brown in colour, 2.5-3cm length, 1.4 – 1.8 cm width with one end slightly depressed and the other end slightly raised, a depressed end scar for the pedicle and at raised end there remains scar for calyx.

- ***Madanaphala* {fruit} of Jamboti region :-**

More or less globose, dark brown in colour, 3.8-4cm length, 2-2.2cm width with

one end slightly depressed and the other end slightly raised, a depressed end scar for the pedicle and at raised end there remains scar

for calyx. Results described under following headings.



Figure -1: Pharmacognostic Study of Madanaphala

B) Powder microscopy:-

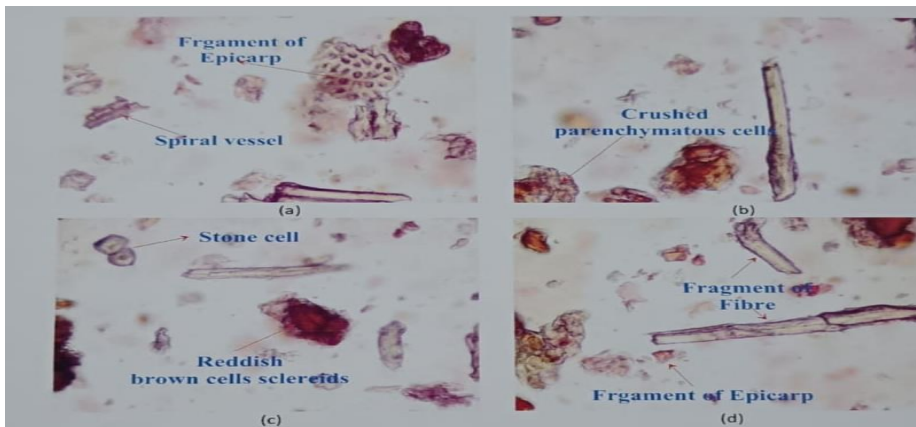


Figure-2: Powder Microscopy of Kapptagudda

Powder microscopy shows: Fragment of Epicarp, spiral vessels (a) crushed parenchymatous cells (b) stone cells, reddish

brown sclerides (c) Fragment of fibre and Fragment of epicarp (d)

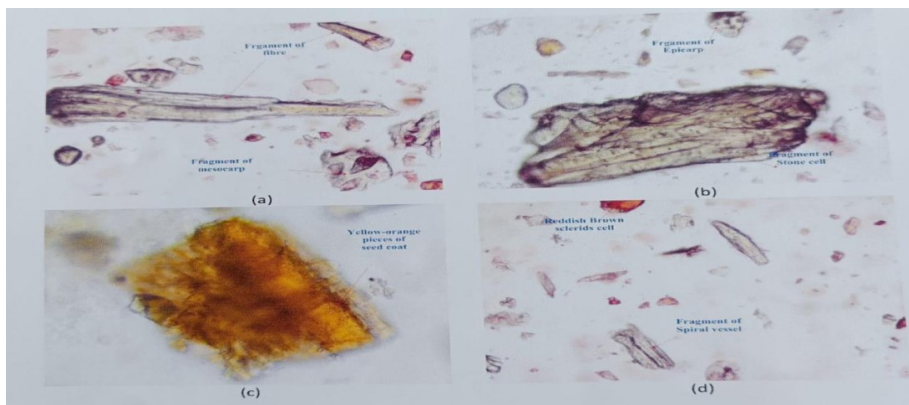


Figure- 3: Powder microscopy of Jamboti

Powder microscopy shows; Fragment of Fibre and Mesocarp (a) Fragment of stone cells and Epicarp (b) Yellow-orange pieces of seed coat

(c) Reddish brown sclerids cells and Fragment of spiral vessels(d).

2) Analytical result:

A. Organoleptic Characters of *Madanaphala* fruit

Table-1:- Organoleptic Characters of *Madanaphala* fruit

SL no.	TESTS	FRUIT OF KAPPATAGUDDA REGION	FRUIT OF JAMBOTI REGION
1.	Part	Fruit	Fruit
2.	Colour	Yellowish brown	Yellowish brown
3.	Taste	Characteristic	Characteristic
4.	Odour	Characteristic	Characteristic

B. Physico-chemical Properties of *Madanaphala* fruit churna:-

The available standard protocols for various procedures were adopted. The obtained results are tabulated below in Table no 2.

Table no-2: Represent Physico-chemical properties of *Madanaphala* fruit powder

SL NO	TESTS	LIMITS	FRUIT OF KAPPATAGUDDA REGION	FRUIT OF JAMBOTI REGION
1.	Foreign matter	Not more than 2%	Nil	Nil
2.	Ash value	Not more than 6%	3.523%	3.698%
3.	Acid insoluble ash	Not more than 0.25%	0.198%	0.243%

4.	Water soluble extractive	Not less than 16%	17.133%	18.325%
5.	Alcohol soluble extractive	Not less than 19%	20.239%	21.065%

C. Preliminary phytochemical screening for organic components: Aqueous and Alcoholic extracts of *Madanaphala churna* was prepared with cold maceration technique. That was

further subjected for qualitative phytochemical screening. The results are mentioned below in Table no. 3

Table no 3: Illustrates the results of phytochemicals in *Madanaphala churna* aqueous and alcoholic extract

SL NO	ORGANIC ELEMENT	SAMPLE OF KAPPATAGUDDA REGION		SAMPLE OF JAMBOTI REGION	
		WATER EXTRACT	ALCOHOL EXTRACT	WATER EXTRACT	ALCOHOL EXTRACT
1.	Carbohydrates	Positive	Positive	Positive	Positive
2.	Reducing sugar	Positive	Positive	Positive	Positive
3.	Monosaccharaides	Positive	Positive	Positive	Positive
4.	Pentose sugar	Negative	Negative	Negative	Negative
5.	Non reducing sugar	Negative	Negative	Negative	Negative
6.	Hexose sugar	Negative	Positive	Negative	Positive
7.	Proteins	Negative	Negative	Negative	Negative
8.	Amino acids	Positive	Positive	Positive	Negative
9.	Steroids	Negative	Positive	Negative	Positive
10.	Flavonoids	Positive	Positive	Positive	Positive
11.	Alkaloids	Negative	Negative	Negative	Negative
12.	Tannins	Negative	Negative	Negative	Negative
13.	Cardiac glycosides	Positive	Positive	Positive	Positive
14.	Anthraquinone glycosides	Negative	Negative	Negative	Negative
15.	Saponin glycosides	Positive	Negative	Positive	Negative

D. TLC – Profile of *MADANAPHALA Churna*

Table no. 4: Illustrates Rf values of phytochemicals separated during TLC from alcoholic ext. of *Madanaphala churna* with solvent system Chloroform : Ethanol (9.5 : 0.5)

SL NO	SAMPLE OF KAPPATAGDDA REGION		SAMPLE OF JAMBOTI REGION	
	SHORT WAVE	LONG WAVE	SHORT WAVE	LONG WAVE
1.	0.13	0.13	0.11	0.15
2.	0.23	0.66	0.21	0.25
3.	0.37	0.76	0.33	0.63
4.	0.61	0.87	0.50	0.75
5.	0.75	0.97	0.62	
6.	0.93		0.68	
7.	0.96		0.95	

E. HPTLC OF MADANAPHALA :-

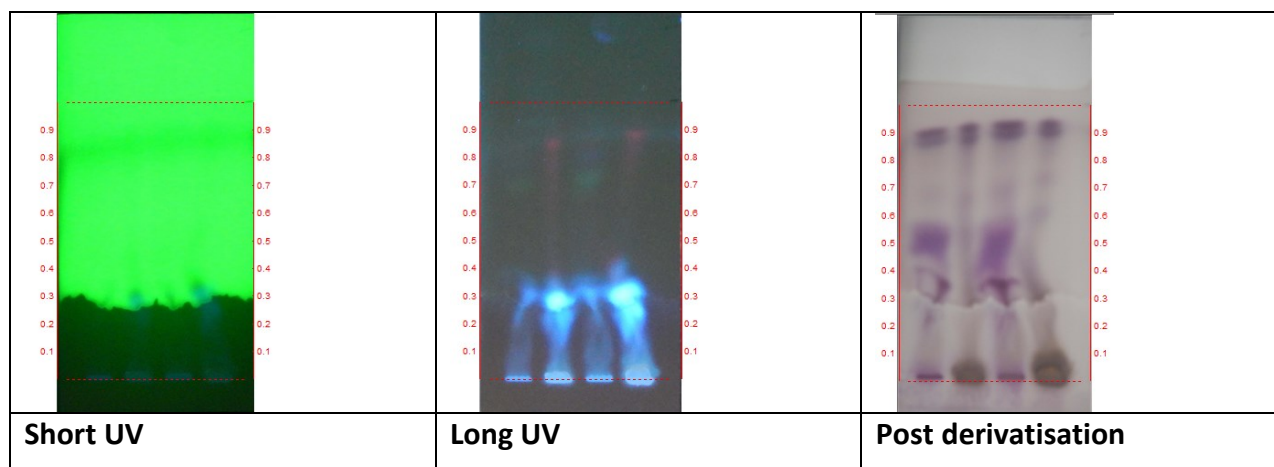


Figure 4. HPTLC photo documentation of Ethanolic extract of *Madanaphala* from Kappatagudda and Ethanolic extract of *Madanaphala* from jamboti

Track 1 - Ethanolic extract of *Madanaphala* from Kappatagudda–4 μ l

Track 2 - Ethanolic extract of *Madanaphala* from jamboti– 4 μ l

Track 3 - Ethanolic extract of *Madanaphala* from Kappatagudda– 8 μ l

Track 3 - Ethanolic extract of *Madanaphala* from jamboti– 8 μ l

Solvent system – Toluene: Ethyl acetate: Formic acid (7.0: 3.0: 0.3)

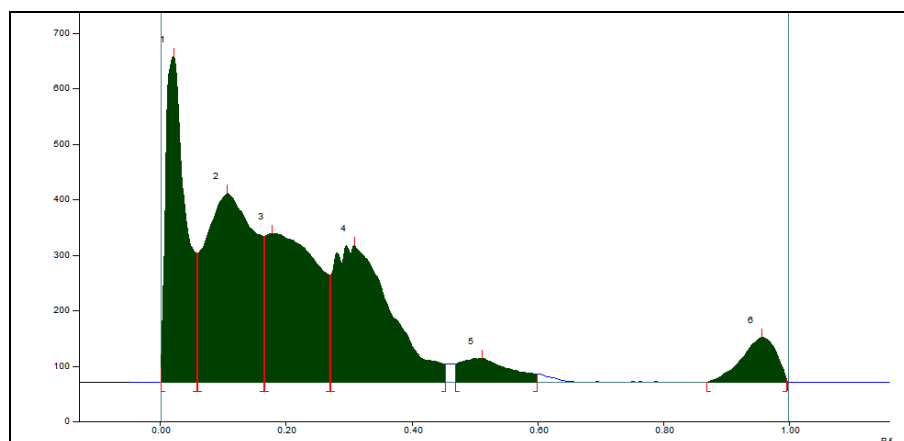
Table 5: R_f values of sample of Ethanol extract of *Madanaphala*

Short UV		Long UV		Post derivatisation	
Kappatagudda	Jamboti	Kappatagudda	Jamboti	Kappatagudda	Jamboti
-	-	0.31(F. blue)	0.31(F. blue)	-	-
-	-	-	-	0.49 (Purple)	-
-	-	-	-	0.53 (Purple)	-

-	-	-	-	0.60 (Purple)	0.61 (Purple)
-	-	-	-	0.68 (Purple)	0.67 (Purple)
-	-	0.73 (F. green)	-	-	-
-	-	-	0.85(F. red)	0.87 (Purple)	-
-	-	-	-	0.90 (Purple)	-

*F – Fluorescent; L –Light; D – Dark

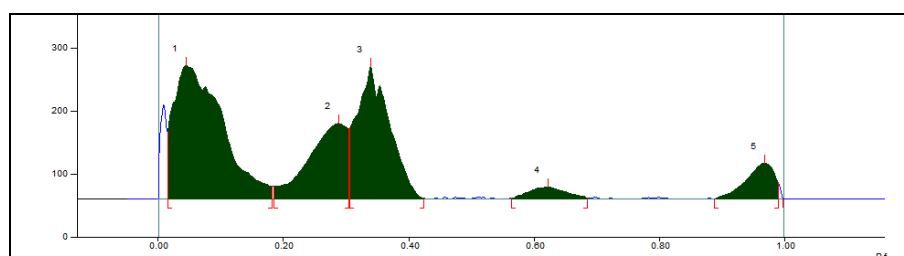
Figure 5:Densitometric scan of at 254nm



Track 3, ID: Ethanol extract of Madanaphala from Kappatagudda

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	26.4 AU	0.02 Rf	587.1 AU	37.50 %	0.06 Rf	32.3 AU	13275.2 AU	18.96 %
2	0.06 Rf	232.4 AU	0.11 Rf	340.1 AU	21.72 %	0.16 Rf	63.3 AU	19300.0 AU	27.56 %
3	0.17 Rf	263.5 AU	0.18 Rf	267.8 AU	17.10 %	0.27 Rf	93.3 AU	15735.1 AU	22.47 %
4	0.27 Rf	193.3 AU	0.31 Rf	246.8 AU	15.77 %	0.45 Rf	33.3 AU	16006.4 AU	22.86 %
5	0.47 Rf	33.8 AU	0.51 Rf	43.0 AU	2.75 %	0.60 Rf	15.0 AU	2482.8 AU	3.55 %
6	0.87 Rf	0.4 AU	0.96 Rf	80.7 AU	5.16 %	1.00 Rf	5.2 AU	3217.4 AU	4.60 %

Fig 6: Ethanol extract of *Madanaphala* from kappatagudda

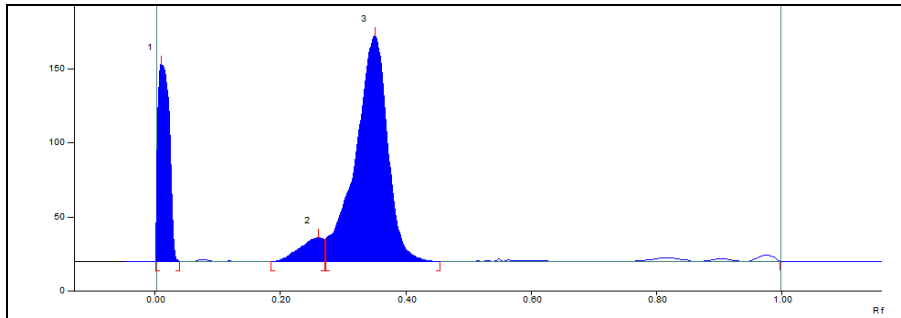


Track 4, ID: Ethanol extract of Madanaphala from jamboti

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.02 Rf	106.9 AU	0.05 Rf	211.1 AU	34.28 %	0.18 Rf	19.8 AU	11920.2 AU	43.12 %
2	0.19 Rf	19.6 AU	0.29 Rf	119.4 AU	19.39 %	0.30 Rf	11.8 AU	5253.4 AU	19.00 %
3	0.31 Rf	112.3 AU	0.34 Rf	209.4 AU	34.01 %	0.42 Rf	1.6 AU	7821.8 AU	28.29 %
4	0.56 Rf	1.0 AU	0.62 Rf	18.7 AU	3.04 %	0.69 Rf	1.9 AU	807.9 AU	2.92 %
5	0.89 Rf	0.1 AU	0.97 Rf	57.1 AU	9.27 %	0.99 Rf	26.5 AU	1842.2 AU	6.66 %

Fig 7. Ethanol extract of *Madanaphala* from Jamboti

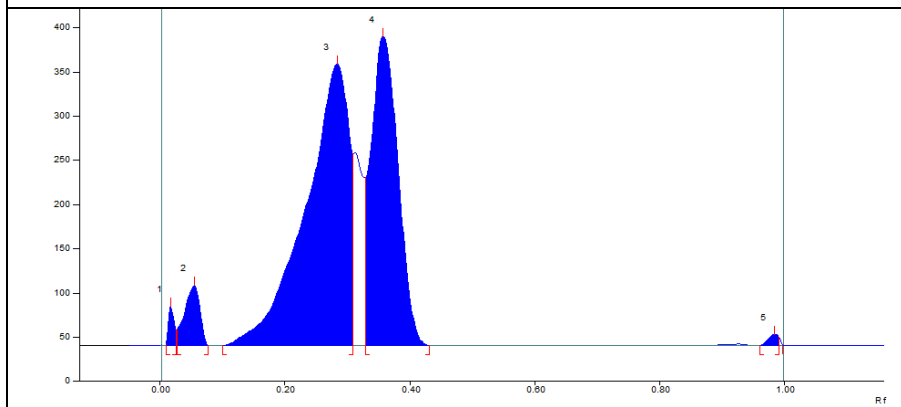
Figure 8.Densitometric scan of at 366nm



Track 3, ID: Ethanolic extract of Madanaphala from Kappatagudd

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.0 AU	0.01 Rf	132.8 AU	44.09 %	0.04 Rf	0.2 AU	1714.7 AU	22.25 %
2	0.19 Rf	0.0 AU	0.26 Rf	16.2 AU	5.38 %	0.27 Rf	15.1 AU	447.0 AU	5.80 %
3	0.27 Rf	15.3 AU	0.35 Rf	152.2 AU	50.53 %	0.45 Rf	0.0 AU	5543.1 AU	71.94 %

Fig 9. Ethanol extract of *Madanaphala* from kappatagudda

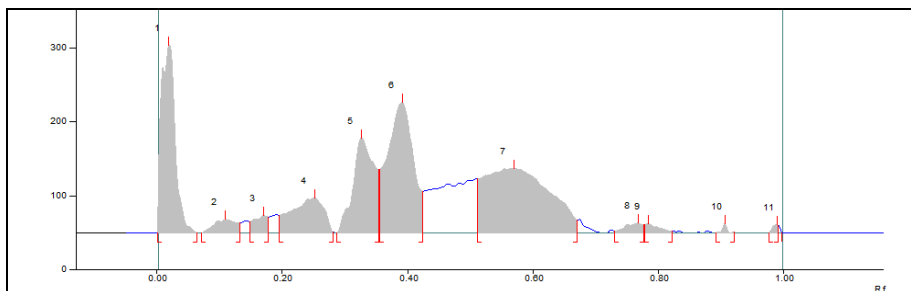


Track 4, ID: Ethanolic extract of Madanaphala from jamboti

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	1.4 AU	0.02 Rf	44.5 AU	5.61 %	0.03 Rf	17.4 AU	285.3 AU	1.00 %
2	0.03 Rf	17.7 AU	0.05 Rf	68.4 AU	8.63 %	0.08 Rf	0.2 AU	1194.4 AU	4.19 %
3	0.10 Rf	0.0 AU	0.28 Rf	318.1 AU	40.10 %	0.31 Rf	16.8 AU	15911.8 AU	55.83 %
4	0.33 Rf	190.1 AU	0.36 Rf	349.3 AU	44.04 %	0.43 Rf	0.0 AU	10964.6 AU	38.47 %
5	0.96 Rf	0.0 AU	0.99 Rf	12.9 AU	1.62 %	0.99 Rf	9.7 AU	143.2 AU	0.50 %

Fig 10. Ethanol extract of *Madanaphala* from Jamboti

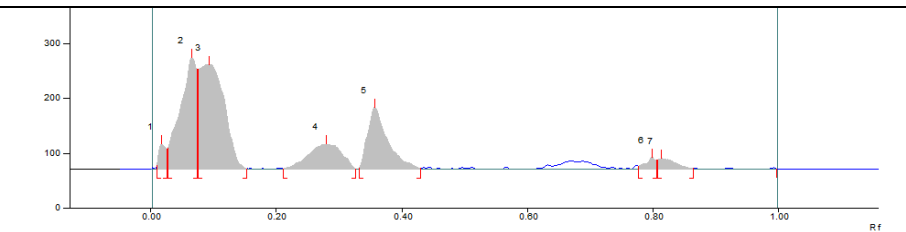
Figure 11. Densitometric scan after derivatisation with ASA at 530nm



Track 3, ID: Ethanolic extract of Madanaphala from Kappatagudd

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.0 AU	0.02 Rf	252.5 AU	32.30 %	0.06 Rf	0.2 AU	3987.0 AU	18.07 %
2	0.07 Rf	0.2 AU	0.11 Rf	18.1 AU	2.32 %	0.13 Rf	13.1 AU	465.0 AU	2.11 %
3	0.15 Rf	15.1 AU	0.17 Rf	23.5 AU	3.00 %	0.18 Rf	21.5 AU	373.1 AU	1.69 %
4	0.20 Rf	23.9 AU	0.25 Rf	46.8 AU	5.99 %	0.28 Rf	0.6 AU	1763.6 AU	8.00 %
5	0.29 Rf	0.0 AU	0.33 Rf	128.2 AU	16.40 %	0.35 Rf	85.5 AU	3099.7 AU	14.05 %
6	0.36 Rf	86.1 AU	0.39 Rf	175.7 AU	22.48 %	0.42 Rf	56.3 AU	5149.1 AU	23.34 %
7	0.51 Rf	72.9 AU	0.57 Rf	87.2 AU	11.15 %	0.67 Rf	16.8 AU	6612.6 AU	29.98 %
8	0.73 Rf	2.3 AU	0.77 Rf	13.3 AU	1.70 %	0.78 Rf	11.4 AU	268.1 AU	1.22 %
9	0.78 Rf	11.4 AU	0.79 Rf	12.9 AU	1.66 %	0.82 Rf	2.0 AU	205.4 AU	0.93 %
10	0.89 Rf	0.4 AU	0.91 Rf	12.8 AU	1.64 %	0.92 Rf	0.8 AU	65.2 AU	0.30 %
11	0.98 Rf	0.3 AU	0.99 Rf	10.6 AU	1.36 %	0.99 Rf	10.3 AU	69.6 AU	0.32 %

Fig 12. Ethanol extract of *Madanaphala* from kappatagudda, Rf-0.57 – Oleanolic acid

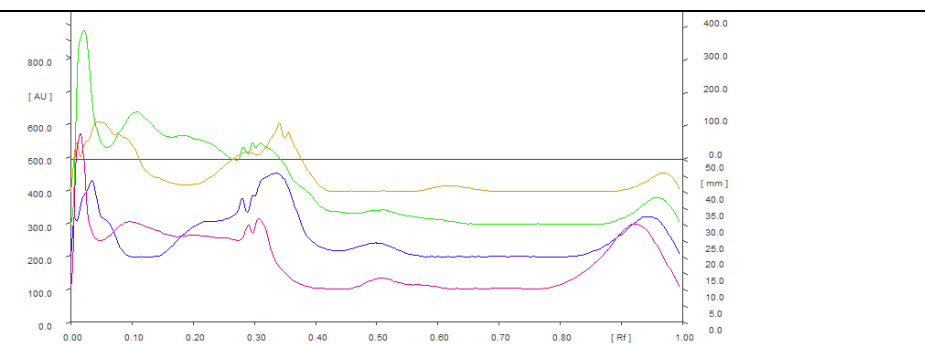


Track 4, ID: Ethanolic extract of Madanaphala from jamboti

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	6.5 AU	0.02 Rf	45.7 AU	7.15 %	0.03 Rf	37.1 AU	386.6 AU	2.63 %
2	0.03 Rf	38.6 AU	0.07 Rf	203.7 AU	31.85 %	0.07 Rf	81.2 AU	3798.0 AU	25.88 %
3	0.08 Rf	181.3 AU	0.09 Rf	190.6 AU	29.81 %	0.15 Rf	0.8 AU	5512.8 AU	37.56 %
4	0.21 Rf	0.8 AU	0.28 Rf	45.5 AU	7.11 %	0.33 Rf	0.4 AU	1765.6 AU	12.03 %
5	0.33 Rf	1.5 AU	0.36 Rf	112.6 AU	17.60 %	0.43 Rf	1.2 AU	2563.7 AU	17.47 %
6	0.78 Rf	5.8 AU	0.80 Rf	22.2 AU	3.47 %	0.81 Rf	16.2 AU	247.2 AU	1.68 %
7	0.81 Rf	16.8 AU	0.81 Rf	19.2 AU	3.00 %	0.87 Rf	1.1 AU	401.5 AU	2.74 %

Fig 13. Ethanol extract of *Madanaphala* from Jamboti Rf-0.57 – Oleanolic acid

Figure 14. 3D Chromatogram



Sample ID	Color
Ethanolic extract of Madanaphala from Kappatagudda	Magenta
Ethanolic extract of Madanaphala from jamboti	Blue
Ethanolic extract of Madanaphala from Kappatagudda	Green
Ethanolic extract of Madanaphala from jamboti	Orange

Fig 15. At 254nm

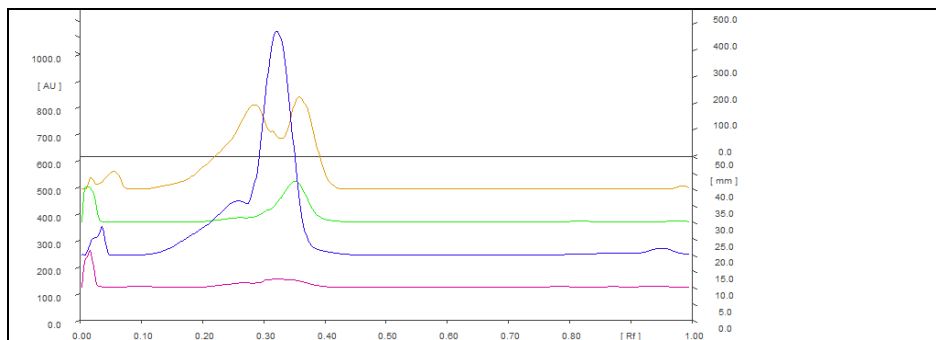


Fig 16. 366nm

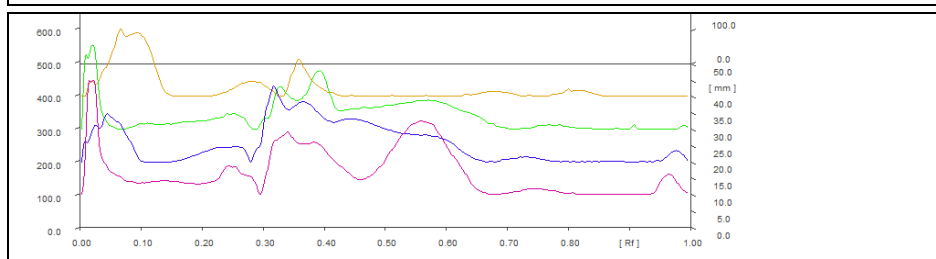


Fig 17. 530nm

DISCUSSION

- The macroscopic evaluation of both the sample of *Madanaphala* did not showed significant changes. The sample of *Madanaphala* collected from Kappatagudda is 2.5-3cm in length and 1.4-1.8 cm in width and the *Madanaphala* collected from Jamboti is 3.8-4cm in length and 2-2.2cm in width.
- Both the sample are free from foreign matter. Ash value of sample collected from the Kappataguda and Jamboti is 3.523% and 3.698% in both the sample it is under API limit of not more than 6% which is mentioned for the dried fruits of *Randia dumentorm* Lamk.
- Acid insoluble ash values of both samples are; Sample collected from Kappatagudda 0.198% and Sample collected from jamboti

- 0.243%. Then water soluble extraction of Kappatagudda and Jamboti sample is 17.133% and 18.325% respectively and the Alcohol soluble extract value of both Kappatagudda and Jamboti sample is 20.239% and 21.065% respectively. In these Acid insoluble ash value and extractive values of water and alcohol soluble, the extractive value is higher in the sample collected from Jamboti region.
- Preliminary phytochemical results of water extract of both samples of *Madanaphala* collected from Kappatagudda and Jamboti showed presence of Carbohydrate ,Reducing sugar, Monosaccharaides, Amino acid, Flavonoids, Cardiac glycosides, Saponin glycosides. Then the alcohol extract of both the sample showed the presence of Carbohydrates, Reducing

sugar, M \ddot{o} n saccharides, Hexose sugar, Steroids, Flavonoids, Cardiac glycosides in common but the same extract of the sample collected from Kappatagudda showed the presence of Amino acids in addition to the above phytochemicals.

- TLC profiling of both extract given an impressive result that directing towards presence of number of phytochemicals. Sample of *Madanaphala* collected from Kappatagudda showed 5 spots of Rf values i.e., 0.13, 0.66, 0.76, 0.87, 0.97 in long wave whereas sample of *Madanaphala* collected from Jamboti region showed 4 spots of Rf value i.e., 0.15, 0.25, 0.63, 0.75 in long wave.
- As of more number of Rf values present in the sample of Kappatagudda, it shows that presence of phytochemicals are more in that sample than the sample collected from Jamboti.
- In HPTLC graph, the maximum height travelled and area covered in the graph of *Madanaphala* sample collected from Kappatagudda than that of the *Madanaphala* collected from Jamboti. So we can consider the *Madanaphala* collected from the Kappatagudda as more pure than that of the sample collected from the Jamboti.
- The standard Rf value of oleonolic acid is 0.57. In the graph of ethanol extract of

Madanaphala collected from the Kappatagudda, the position of graph showed 0.51 whereas graph of Ethanol extract of *Madanaphala* collected from Jamboti does not showed any nearby Rf value to 0.57. This shows the presence of oleonolic acid in the sample collected from Kappatagudda but it is absent in the sample collected from Jamboti.

SCOPE FOR FURTHER STUDIES

- Different areas and places can be taken in to the consideration for the further study which is predominant of Agneya, Vayuvya and Akashiya mahabhoota, excluding the area which we have been considered in the study.
- Qualitative HTPLC analysis can be carried out to know the exact phytochemical present in the sample.

CONCLUSION

- On observation of morphology of *Madanaphala* collected from Kappatagudda and Jamboti, they showed variation in size but there was no marked variation in colour, taste and other organoleptic characters.
- The phytochemical analysis of *Madanaphala* collected from two different region i.e., Kappatagudda and Jamboti didn't show any significant changes.

- TLC of both the samples showed the presence of phytochemicals at different Rf values but the sample collected from Kappatagudda has more number of Rf values which indicate presence of more number of phytochemicals in it than *Madanaphala* collected from Jamboti.
- The standard Rf value of Oleanolic acid is 0.57. In the HTPLC result the nearest Rf value observed was 0.51 which is found in the *Madanaphala* collected from Kappatagudda, but no nearest Rf value was observed in *Madanaphala* collected from Jamboti.
- As our study also showed that *Madanaphala* collected from Kappatagudda region which comes under *Jangala desha* having *Agni, Vayu* and *Akash mahabhoota* predominant is of superior quality than the *Madanaphala* collected from Jamboti region which comes under *Anupa desha* having *Parthiva* and *Aap mahabhoota*. So by this study we can justify the reference which is explained by our Acharya Sushruta in the context of *Bhumipravibhagiyamadhyaya* that *vamana dravya* should be collected from *desha* predominant of *Akash, Vayu* and *Agni mahabhoota*.

Acknowledgement: Thanks to Principal, SBSS, Krishna Ayurvedic Medical College and Hospital, Sankeshwar for giving an opportunity to conduct research.

Source of Support: Rajiv Gandhi University of Health Sciences, Bengaluru

REFERENCES

- 1) Meena, Ak, et al. "EVALUATION of PHYSICOCHEMICAL and PRELIMINARY PHYTOCHEMICAL STUDIES on the FRUIT of EMBLICA OFFICINALIS GAERTN." *Asian Journal of Traditional Medicines*, vol. 5, no. 2, 1 Jan. 2010, asianjtm.syphu.edu.cn/EN/asianjtm.syphu.edu.cn/EN/Y2010/V5/I2/75. Accessed 15 Sep. 2023.
- 2) Meena, Ak, et al. "EVALUATION of PHYSICOCHEMICAL and PRELIMINARY PHYTOCHEMICAL STUDIES on the FRUIT of EMBLICA OFFICINALIS GAERTN." *Asian Journal of Traditional Medicines*, vol. 5, no. 2, 1 Jan. 2010, asianjtm.syphu.edu.cn/EN/asianjtm.syphu.edu.cn/EN/Y2010/V5/I2/75. Accessed 15 Sep. 2023.
- 3) Meena, Ak, et al. "EVALUATION of PHYSICOCHEMICAL and PRELIMINARY PHYTOCHEMICAL STUDIES on the FRUIT of EMBLICA OFFICINALIS GAERTN." *Asian Journal of Traditional Medicines*, vol. 5, no. 2, 1 Jan. 2010, asianjtm.syphu.edu.cn/EN/asianjtm.syphu.edu.cn/EN/Y2010/V5/I2/75. Accessed 15 Sep. 2023.
- 4) Yadavaji Trikamaji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka Samhita of Charaka, Kalpasthan, chapter 1, verse no.349, 2nd edition, Varanasi; Chowkhambha surabharti prakashan;2017:653
- 5) Yadavaji Trikamaji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka

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- Samhita of Charaka, Kalpasthan, chapter 1, verse no.349, 2nd edition, Varanasi; Chowkhambha surabharti prakashan;2017:653
- 6) Parashuram Shastri Vidyasagar(editor), Commentary: Adhamalla's Dipika and Kasirama's Gudhartha-dipika, Sharangdhar samhita of Sri Sarngadharacarya, Pratham kanda, chapter 4, verse no.7, 2nd edition, Varanasi; Chaukamba surabharti prakashan; 2013: 36.
- 7) Vaidya jadavji trikamji (editor); commentary - Nibandhasangraha of sri dhalanacharya on Sushrutasamhita of sushruta; Sutrasthana ;Chapter 36 verse no. 6 Varanasi; Chaukamba surabhati Prakashan ;2018: 159.
- 8) Yadavaji Trikamaji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka Samhita of Charaka, Kalpasthan, chapter 1, verse no.349, 2nd edition, Varanasi; Chowkhambha surabharti prakashan;2017: 653
- 9) Vaidya jadavji trikamji acharya and Narayan Ram Acharya(editor), commentary: Nibandhasangraha of sri dalhanacharya on Sushruta samhita of sushruta, Sutrasthana, Chapter 36, verse no. 6, 2nd edition, Varanasi; Chaukamba surabhati Prakashan;2018: 159.
- 10) Hari sadhashiva shastri (editor), commentary: Sarvangasundara of arundatta & Ayurveda Rasayan of Hemadri on Ashtanga Hridayam of Vagbhata, Sutrasthana, chapter 1, verse no. 23, 2nd edition, Varanasi; Chaukamba surabhati Prakashan: 25.

CITE THIS ARTICLE AS

Madhushree C S, Manjunath H. Dundi. Phytochemical and chromatographical evaluation of *Madanphala (Randia dumetorum Lamk.)* from different *Desha* based on *Akashadi Panchamahabhoota*. *J of Ayurveda and Hol Med (JAHM)*. 2024;12(3):30-43

Conflict of interest: None

Source of support: Rajiv Gandhi University of Health Sciences, Bengaluru