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## Phytochemical Analysis of *Vishaghna Gana Chakrika* - An Ayurvedic Formulation

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### ABSTRACT

**Background:** *VishaghnaGanaChakrika* is an Ayurvedicherbal formulation which is used as *Dhoopan* procedure for anti-microbial effect. Ayurvedic drugs are natural products which are obtained from herbs, minerals and animal products. There are many formulations mentioned in Ayurvedic classic texts which are either used single or combination with other drug, Acharya Charaka has explained 50 groups of 10 herbs each in *Shad Virechana Shata Shriteeya Adhyaya*. *VishaghnaGana* is one among them. Drugs which act against toxic substances are called as *Vishaghna*. It includes *Haridra* (*Curcuma longa*), *Manjishtha* (*Rubiocordifolia*), *Suvahaa* (*Pluchelanceolata*), *Sookshamaelaa* (*Elettariacardamomum*), *Paalindee* (*Operculinaturpethum*), *Chandan* (*Santalum album*), *Kataka* (*Strychnos potatorum*), *Shireesha* (*Albizziabbeck*), *Sinduvaara* (*Vitexnegundo*), *Shleshmaataka* (*Cordiadichotoma*). With growing awareness of health care and safety aspects there has been an increase in demand for the Phyto-pharmaceutical products of Ayurveda.

**Aims:** The present work was carried to analyse the Phyto chemical activity of *Vishaghna Gana Chakrika*.

**Methodology:** *VishaghnaGanaChakrika* is prepared as per the classical reference of preparation of *Chakrika*. Drug was analysed for the following parameters like phytochemical test and High Performance Thin Layer Chromatography (HPTLC).

**Results:** Phytochemical test revealed the presence of alkaloid, steroid, carbohydrate, tannin, resin, Quinone. HPTLC photo documentation, densitometric scan, R<sub>f</sub> values are presented in respective tables and figures.

**Conclusion:** On the basis of observations and experimental results of *Vishaghna Gana Chakrika* has evaluated presence of alkaloids, steroids, carbohydrates, tannin, resin and



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quinonein it. This study may be used as standard protocol in the further quality control researches.

## **KEYWORDS**

*VishaghnaGana, Dhoopana, Phyto-chemical, HPTLC, Anti-Microbial*



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## INTRODUCTION

Ayurvedic drugs are natural products which are obtained from herbs, minerals and animal products. There are many formulations are mentioned in Ayurvedic classic texts which in single or combination of drugs. Acharya Charaka has explained 50 groups of 10 herbs each in *Shad VirechanaShatashriteeyaAdhyaya*. *VishaghnaGana* is one among them. *VishaghnaGanaChakrika* is an Ayurvedic herbal formulation which is used as *Dhoopana* procedure for anti-microbial effect.

Drugs which act against toxic substances are called as *Vishaghna*. It includes *Haridra (Curcuma longa)*, *Manjishtha (Rubiaccordifolia)*, *Suvahaa (Pluchealanceolata)*, *Sookshamaelaa (Elettariacardamomum)*, *Paalindee (Operculinaturpethum)*, *Chandan (Santalum album)*, *Kataka (Strychnosptatorum)*, *Shireesha (Albizzialebbeck)*, *Sinduvaara (Vitexnegundo)*, *Shleshmaataka (Cordiadicotoma)*. Standardisation of Ayurvedic drugs is necessary as growing awareness of health care and safety aspects of herbal drugs. Hence analytical parameters are essential as a measure of quality control and standardization of the finished product.

## AIMS AND OBJECTIVES:

The objective of the study was to prepare the *VishaghnaGanaChakrika* and analyse its Phyto-Chemical parameters and HPTLC.

## MATERIALS AND METHODS:

Collection, Identification and Authentication of Raw Drug

The raw drugs for the study were procured from the Sri Dharmasthala Manjunatheshwara Pharmacy, Hassan. The ingredients were identified and authenticated in the department of DravyaGuna, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan. Phytochemical screening procedure of *VishaghnaGanaChakrika* is done in Sri DharmasthalaManjunatheshwaraCenter for Research in Ayurveda and Allied Sciences, Udupi.

**Table 1** SHOWING THE INGREDIENTS OF VISHAGHNA GANA AND PART USED<sup>1</sup>:

SL	DRUG	PARTS USED
1.	<i>HARIDRA (Curcuma longa)</i> <sup>2</sup>	Rhizome
2.	<i>MANJISTA (Rubiaccordifolia Linn)</i> <sup>3</sup>	Root
3.	<i>SUVAHA (Pluchealanceolataoliver&amp;hiern)</i> <sup>4</sup>	Roots
4.	<i>SUKSHMA ELA (Elettariacardamomum)</i> <sup>5</sup>	Seeds
5.	<i>PALINDI</i>	Root



	<i>(Operculinaturpethum)</i> <sup>6</sup>	
6.	CHANDANA ( <i>Santalum album</i> ) <sup>7</sup>	Heart wood
7	KATAKA <i>(Strychnos potatorium Linn. f.)</i> <sup>8</sup>	Seeds
8.	SIRISHA ( <i>Albizia lebeckbenth</i> ) <sup>9</sup>	Seeds.
9.	SINDUVARA ( <i>Vitex nerugundo</i> ) <sup>10</sup>	Leaf.
10.	SLESHMATAK <i>(Cordia dichotoma)</i> <sup>11</sup>	Bark.

### Method of Drug Preparation

Ingredients mentioned in Table 1 are 10 *Vishaghna Gana* drugs taken in

**Table 2** Qualitative tests performed are

<b>Alkaloids</b> Dragendroff's test Wagners test Mayers test Hagers test	<b>Carbohydrate</b> Molish test Fehlings test Benedicts test
<b>Steroids</b> Liebermann- buchard test Salkowski test	<b>Tannin</b> With FeCl <sub>3</sub>
<b>Flavanoids</b> Shinoda's test	<b>Saponins</b> With NaHCO <sub>3</sub>
<b>Triterpenoids</b> Tin and thionyl chloride test	<b>Coumarins</b> With 2 N NaOH
<b>Phenols</b> With alcoholic ferric chloride	<b>Carboxylic acid</b> With water and NaHCO <sub>3</sub>
<b>Amino acid</b> With ninhydrine reagent	<b>Resin</b> With aqueous acetone
<b>Quinone</b> Conc. sulphuric acid	

### HPTLC

*Vishaghana Gana Choorna Chakrika*, 1g, powder was extracted with 20 ml of alcohol and kept for 24hrs for cold maceration then was filtered. The above extract 3, 6 and 9µl was applied on a pre-coated silica gel F254 on Aluminium plates to a band width of 7 mm using Linomat 5 TLC applicator. The plate was developed in Toluene: Ethyl acetate (9.0: 1.0). The developed plates were visualized in short UV, long UV, and then derivatised with vanillin sulphuric acid and scanned under UV 254nm, 366nm and 620nm. R<sub>f</sub>, colour

powdered form separately in equal quantity. Under all aseptic precautions, these powders mixed together and made into a fine paste. Then it made into Chakrikas of equal size weighing about 5 grams each. Then it is dried under sunlight for 2 days.

### Phyto chemical screening procedure:

of the spots and densitometry scan were recorded.

## DISCUSSION AND RESULTS

Aim of the analysis was to check the quality of *Vishaghna Gana Chakrika* and to standardize the formulation.

**Table 3** Showing Results of preliminary phytochemical screening of *Vishaghana Gana Choorna Chakrika*

Test	Inference
Alkaloid	+
Steroid	+
Carbohydrate	+
Tannin	+
Flavanoids	-
Saponins	-
Terpenoid	-



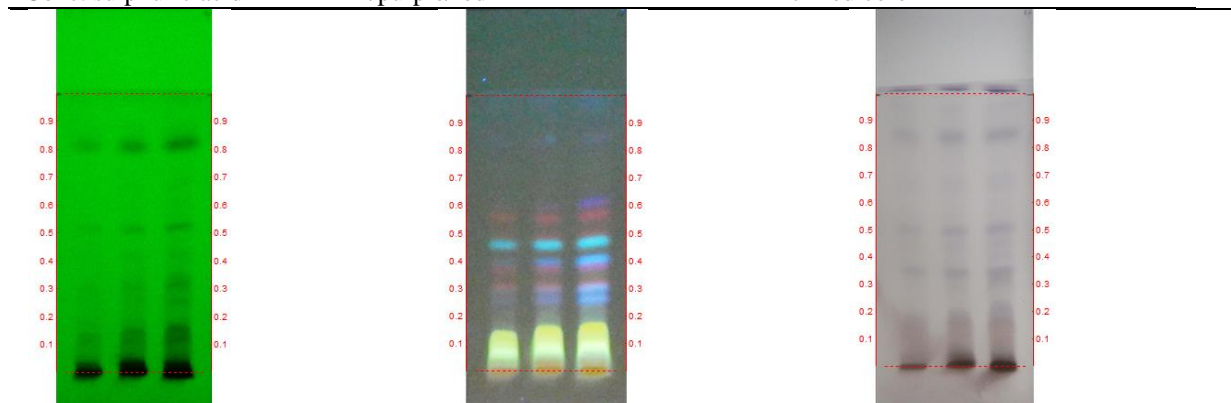
Coumarins	-
Phenols	-
Carboxylic acid	-
Aminoacids	-

Resin	+
Quinone	+

(+) - Present; (-) – negative

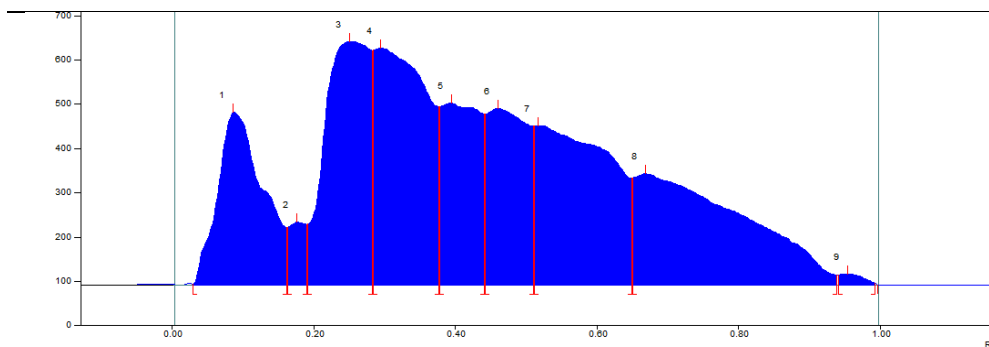
**Table 4** Showing Results of preliminary phytochemical colour screening of *VishaghanaGanaChoornaChakrika*

Tests	Colour if positive	Alcoholic extract
<b>Alkaloids</b>		
Dragendroff's test	Orange red precipitate	Orange red precipitate
Wagners test	Reddish brown precipitate	Reddish brown precipitate
Mayers test	Dull white precipitate	Dull white precipitate
Hagers test	Yellow precipitate	Yellow precipitate
<b>Steroids</b>		
Liebermann- buchard test	Bluish green colour	Bluish green colour
Salkowski test	Bluish red to cherry red color in chloroform layer and green fluorescence in acid layer	Bluish red to cherry red color in chloroform layer and green fluorescence in acid layer
<b>Carbohydrate</b>		
Molish test	Violet ring	Violet ring
Fehlings test	Brick red precipitate	Brick red precipitate
Benedicts test	Red precipitate	Red precipitate
<b>Tannin</b>		
With FeCl <sub>3</sub>	Dark blue or green or brown	Brown color
<b>Flavanoids</b>		
Shinoda's test	Red or pink	Brown color
<b>Saponins</b>		
With NaHCO <sub>3</sub>	Stable froth	No stable froth
<b>Triterpenoids</b>		
Tin and thionyl chloride test	Pink	Brown color
<b>Coumarins</b>		
With 2 N NaOH	Yellow	Dark red color
<b>Phenols</b>		
With alcoholic ferric chloride	Blue to blue black	Brown color
<b>Carboxylic acid</b>		
With water and NaHCO <sub>3</sub>	Brisk effervescence	No effervescence
<b>Amino acid</b>		
With ninhydrine reagent	Purple colour	Brown color
<b>Resin</b>		
With aqueous acetone	Turbidity	Turbidity
<b>Quinone</b>		
Conc. sulphuric acid	Pink/purple/red	Brick red color





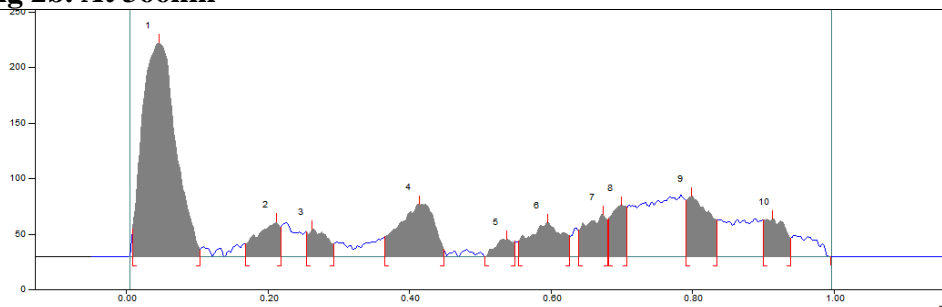




Track 3, ID: Vishahara churna chakrika

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.03 Rf	2.7 AU	0.09 Rf	389.6 AU	12.72 %	0.16 Rf	30.2 AU	18171.5 AU	11.16 %
2	0.16 Rf	130.9 AU	0.18 Rf	142.1 AU	4.64 %	0.19 Rf	37.2 AU	2348.5 AU	1.44 %
3	0.19 Rf	137.5 AU	0.25 Rf	549.1 AU	17.93 %	0.28 Rf	29.9 AU	25296.3 AU	15.53 %
4	0.29 Rf	530.2 AU	0.30 Rf	534.7 AU	17.46 %	0.38 Rf	03.0 AU	28343.6 AU	17.40 %
5	0.38 Rf	403.0 AU	0.40 Rf	411.0 AU	13.42 %	0.44 Rf	86.6 AU	16066.6 AU	9.86 %
6	0.44 Rf	386.7 AU	0.46 Rf	399.5 AU	13.04 %	0.51 Rf	58.7 AU	16458.6 AU	10.10 %
7	0.51 Rf	359.0 AU	0.52 Rf	360.3 AU	11.76 %	0.65 Rf	41.6 AU	27241.3 AU	16.72 %
8	0.65 Rf	242.2 AU	0.67 Rf	251.3 AU	8.20 %	0.94 Rf	23.1 AU	28327.2 AU	17.39 %
9	0.94 Rf	23.3 AU	0.95 Rf	25.1 AU	0.82 %	0.99 Rf	4.6 AU	625.8 AU	0.38 %

Fig 2b. At 366nm



Track 3, ID: Vishahara churna chakrika

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	25.2 AU	0.05 Rf	192.6 AU	37.40 %	0.10 Rf	5.9 AU	6465.5 AU	45.61 %
2	0.17 Rf	11.5 AU	0.21 Rf	31.1 AU	6.04 %	0.22 Rf	26.1 AU	725.9 AU	5.12 %
3	0.25 Rf	22.0 AU	0.26 Rf	24.8 AU	4.82 %	0.29 Rf	11.3 AU	488.7 AU	3.45 %
4	0.37 Rf	18.2 AU	0.41 Rf	47.5 AU	9.22 %	0.45 Rf	6.2 AU	1686.7 AU	11.90 %
5	0.51 Rf	0.0 AU	0.54 Rf	15.9 AU	3.09 %	0.55 Rf	14.0 AU	284.0 AU	2.00 %
6	0.55 Rf	13.8 AU	0.60 Rf	30.6 AU	5.94 %	0.63 Rf	19.0 AU	1010.8 AU	7.13 %
7	0.64 Rf	23.7 AU	0.67 Rf	38.1 AU	7.41 %	0.68 Rf	33.4 AU	812.6 AU	5.73 %
8	0.68 Rf	34.0 AU	0.70 Rf	46.4 AU	9.00 %	0.71 Rf	44.4 AU	719.1 AU	5.07 %
9	0.79 Rf	50.1 AU	0.80 Rf	54.2 AU	10.53 %	0.84 Rf	33.0 AU	1253.4 AU	8.84 %
10	0.90 Rf	32.8 AU	0.91 Rf	33.8 AU	6.56 %	0.94 Rf	16.7 AU	727.8 AU	5.13 %

Fig 2c. At 620nm

Figure 2 Densitometric scan of VishaghanaGanaChoornaChakrika

**HPTLC Report Discussion**

Total 28 peaks detected in 254nm, 366nm and 620nm different Rf Value. Same peak

detected equal in Rf value 0.67 in both 366nm (8.20%) and 620nm (7.41%). Peaks detected in HPTLC we can consider total 27 number of active component





where detected from *VishaghnaGanaCharika*. Maximum % of active component area where occupied in  $R_f$  value 0.05 (37.40%), 0.94 (21.33%), 0.04 (21.31%). Hence it can be considered that these 3 active components may be responsible for anti-microbial activity.

*VishaghanaGana* is one among the *Ganas* mentioned in Charaka Samhita which includes 10 drugs as anti-toxic drugs. *Vishaghna Ghana* has *Rasa: Madhura, Tiktha, Katu, KashayaRasa; Guna: Ruksha, Laghu, Guru, Tikshna, Vishada, Snigdha, PichilaGunas; Virya: Ushna, Sheeta, AnushnaVirya; Vipaka: Katu, MadhuraVipaka; Karma: Vata-Pitta Shamaka, Kapha-Vatashamaka, Kapha-Pitta Shamaka, Vatahara, TridoshaShamakaproperties.*

Phytochemical test results have revealed the presence of alkaloid, steroid, carbohydrate, tannin, resin, quinine. HPTLC photo documentation, densitometric scan,  $R_f$  values are presented in respective tables and figures. The *Chakrika* of *VishaghnaGana* is proven to be safe. Because of the presence of alkaloids, steroids, carbohydrates, tannin, resin and quinine it acts as anti-microbial. This helps in reducing airborne microorganisms which are results in diseases.

## CONCLUSION

*VishaghnaGanaChakrika* has been standardized as per standard testing protocol. Organoleptic, Phyto-chemical evaluation of *VishaghnaGanaChakrika* illustrated the specific characters of all ingredients which were used in the preparation. On the basis of observations and experimental results, this study may be used as reference standard in the further quality control researches. Further studies may be carried out on *VishaghnaGanaDravyas* based on identification and separation of active ingredients with the help of various biomarkers.



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