



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

A PHARMACEUTICAL ANALYSIS OF SIDDHARTAKA YOGA: AN AYURVEDA CLASSICAL FORMULATION

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Received 16th June 2021; Revised 11th July 2021; Accepted 25th Aug. 2021; Available online 25th Jan. 2022

<https://doi.org/10.31032/ijbpas/2022/11.1.2041>

ABSTRACT

In the concept of Chikitsa Chatushpada importance of Dravya has been explained. When we talk about diagnosis of disease the next point striking to our mind is what kind of medicine is suitable for disease which helps the person overcome from it. Disorders either it belongs to physically or mentally, equal importance given to both. Hence by considering this classical medicine Siddhartaka Yoga have been selected, which was explained by Yoga Ratnakara in Unmada Chikitsa. After the manufacture the formulation as per classical reference it requires standardization in the modern parameters. **Aim:** To analyse the pharmaceutical evaluation of Siddhartaka Yoga. **Materials and method:** Final product was subjected to physiochemical analysis such as microscopic study loss of drying, ash value, pH, Gas chromatography test, loss on drying, ash value, water soluble extract, HPTLC (High Performance Thin Layer Chromatography) were evaluated along with organoleptic characteristics. **Conclusion:** The pharmaceutical study was carried out to standardize the end product of Siddhartaka Yoga in terms of its identification, quality and efficacy.

Keywords: Siddhartaka Yoga, HPTLC, Pharmaceutical study, Gas chromatography

INTRODUCTION

Ayurveda believes that success of any treatment is totally depends upon Chatushpada of Chikitsa. Chatushpada are Bhishag (physician), the Upastha

(Medical Attendant), Rogi (patient) and Dravya (medicine). These four factors are mutually dependant on each other. These four pillars are considered mandatory to provide relief to the patient. Absence of any one of these, the treatment would not be possible. Each of the four factors possesses four qualities essential for a treatment to be successful. When all these four factors are favorable, then the treatment will be successful. Therefore this review article attempts to explain the importance of Chikitsa Chatushpad in detail as mentioned in Ayurvedic literatures.

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Ayurveda explains the root for successful treatment is depends on chikitsa chatushpada¹. chikitsa chatushpada are Bhashag (physician), Dravya (medicine), Rogi (patient) and Upastha (attendant). Ayurveda is science which educates the individual how to lead healthy life physically as well as mentally. This is the only science which gives the importance of longevity. Ayurveda has the knowledge base and methodologies to provide health care throughout the course of life. It provides simple, cost-effective techniques that do not have the prevalence of toxic side-effects inherent in Western allopathic medicine.

MATERIALS AND METHODS

Collection of Raw materials for Siddhartaka Yoga²

The ingredients of Siddhartaka Yoga were produced from the Pharmacy, SDM Ayurveda GMP certified Pharmacy Udupi. Their identities were confirmed correlating their morphological and microscopical characters with those given in the literature (API). The name of the drug, parts used and its quantity were mentioned in **Table 1**.

The identification and authentication of procured raw drugs was completed by SDM Ayurveda Pharmacy, Udupi. The Sarshapa³ is the main ingredient of the Siddhartaka yoga analysis were mentioned in **Table 2**.

Table 1

Sl. No.	DRUG	BOTANICAL NAME	FAMILY	PART USED
1	Sarshapa	Brassica alba	Brassicaceae	Seed
2	Shireesha	Albizia lebeck	Mimosoideae	Seed
3	Vacha	Acorus calamus	Araceae	Root
4	Hingu	Ferula northex	Apiaceae	Gum
5	Karanja	Pongamia pinnata	Fabaceae	Seed
6	Devadaru	Cedrus deodara	Pinaceae	Rhizome
7	Manjishta	Rubia cordifolia	Rubiaceae	Root
8	Haritaki	Terminalia chebula	Combretaceae	Fruit
9	Vibhitaki	Terminalia bellarica	Combretaceae	Fruit
10	Amalaki	Phyllanthus emblica	Euphorbiaceae	Fruit
11	Aparajita	Clitoria ternatea	Fabaceae	Root
12	Pippali	Piper longum	Piperaceae	Fruit
13	Maricha	Piper nigrum	Piperaceae	Fruit
14	Shunthi	Zinziber officinale	Zingiberaceae	Rhizome
15	Priyangu	Aglaia elaeagnoides	Verbenaceae	Flower
16	Haridra	Curcuma longa	Zingiberaceae	Rhizome
17	Daruharidra	Berberis aristata	Berberidaceae	Root

Table 2

SDM AYURVEDA PHARMACY		Ref:ISO 9001:2015	
P.O Kuthpady-574118,Udupi Dist;Karnataka State		DOC.No.SDMAP/QC/02/R001	
Q.C DEPARTMENT			
CERTIFICATE OF ANALYSIS FOR RAW MATERIALS			
Name of the raw material: Sarshapa		References:IP/BP/API/IN HOUSE	
Supplier name:Manav Ayurvedic Company		A.R.NO: RM190269	
Category:Seed		BATCH NO:	
GRN No:		ANALYSIS STARTED ON:14.06.2019	
Item Code:SRP		ANALYSIS COMPLETED ON:15.06.2019	
Quantity Received:25Kg			
SL.NO	Physicochemical test	Limits	Results
1	Description	Small seed having pale or reddish-brown in colour;under magnifying glass it is seen to be minutely reticulated; bitter taste.	Complies
2	Foreign Matter	NMT 2%	Complies
3	Total Ash	NMT 5%	4.85%
4	Acid-Insoluble Ash	NMT 0.5%	0.30%
5	Water soluble extractive	NLT 16%	24.40%
Conclusion: The above samples complies/ does not comply to the standards as per the specification.			
			
 Analysed by Q.C Chemist		 Approved By Officer Q.C	

Preparation of the Drug (Siddhartaka Yoga)

Method of preparation: -

All the ingredients as per the formula is formulated & issued. The above ingredients are washed & cleaned (to remove foreign matters like mud, dust etc. if any) Washed material is disintegrated to achieve desired size reduction so that efficient extraction could be done during the boiling. The disintegrated material is charged in to the Drug Boiler & added with prescribed amount of water. Controlled boiling is carried out and in process quality control is performed to check progress of extraction and once affirmed the decoction is drained. Again, for the same material, fresh water is added till the material is immersed and boiled for 3 hours – this second extraction decoction is drained. Kashaya first & second extraction - are mixed and concentrated with the vacuum concentrator – to get the desired volume. Sample is

given to Q.C (quality control) for testing and approval is obtained as per standard format. The concentrated Kashaya is spray dried in the spray dryer. The dry extract is collected in air tight bins Dry extract sample is given to q.c for testing for all inhouse QC parameters as well as HPTLC marking. The dry extract is capsulated in automatic capsule filling machine. The capsule sample is given to q.c for approval. After approved the capsule are packed as per requirement.

Methods of physicochemical evaluation

Siddhartaka Yoga was analysed by using qualitative and quantitative parameters. All the procedures were conducted at GMP certified pharmacological lab, SDM Ayurveda pharmacy Udupi. The physicochemical parameters those are description, loss on drying, average weight of filled capsule, weight variation limit and disintegration time were performed. Details are mentioned in **Table 3**.

Table 3

	SDM AYURVEDA PHARMACY		Ref:ISO 9001:2015
	P.O Kuthpady-574118,Udupi Dist;Karnataka State		DOC.No.SDMAP/QC/02/R001
	Q.C DEPARTMENT		
CERTIFICATE OF ANALYSIS FOR CAPSULE			
Product name:Siddarthaka Yoga Capsule		Mfg.Date:Sep-2019	
Item code:SYE		Exp.Date: Aug-2021	
A.R.No:FP19104		ANALYSIS STARTED ON:31.07.2019	
Batch NO:SYE001		ANALYSIS COMPLETED ON:31.07.2019	
Batch Size:125000			
REFERENCES: Pharmacopoeial Standards for Ayurvedic Formulations/In House Specification.			
SL.NO	Physicochemical test	Limits	Results
1	Description	Transparent capsule	Complies

		filled with brown coloured extract having characteristics smell and taste	
2	Loss on drying of extract at 110°C	NMT 7% w/w	3.95% w/w
3	Average weight of filled capsule	500mg	500mg
4	Weight Variation Limit	500±5%w/w	500mg
5	Disintegration Time	NMT 30min	14min20sec

Conclusion: The above samples complies/does not comply to the standards as per the specification.

HPTLC (high performance thin layer chromatography)

HPTLC (high performance thin layer chromatography) which provides qualitative and quantitative analysis of drugs and fulfils all the quality requirements for use in fully regulated environments. HPTLC meant for drug analysis.

METHODOLOGY

1gm of sample of siddharthaka yoga was dissolved in 10.0ml of alcohol kept overnight and filtered. 3,6 and 9µl of each of the above extract was applied on a pre-coated silica gel F₂₅₄ on aluminium plates to a band width of 7mm using Linomat 5 TLC applicator. The plate was developed

Toluene: Ethyl acetate (9.0:1.0). The developed plates were visualized in short UV, long UV and then derivetised with vanillin sulphuric acid and scanned under UV 254nm, 366nm. R_f colour of the spots and densitometric scan were recorded. Details are mentioned in **Figure 1, 2**.

Heavy metal analysis

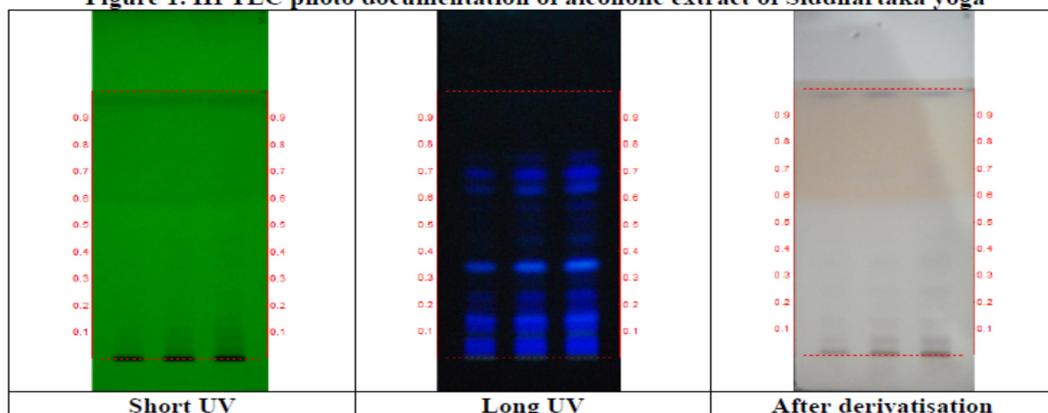
Siddharthaka yoga heavy metal analysis was done for lead, cadmium, mercury and arsenic. Details are mentioned in **Figure 3**.

Microbiology study

The microbiology study was performed for *E coli*, *Pseudomonas aeruginosa*, *Salmonella*, *Staphylococcus aureus*, Total bacteria count, Yeast and mould count. Details are mentioned in **Figure 4**.

Part C: Results

Figure 1. HPTLC photo documentation of alcoholic extract of Siddhartaka yoga



Solvent system - Toluene: Ethyl Acetate (9.0: 1.0)

Track 1 – Siddhartaka yoga – 3µl

Track 2 – Siddhartaka yoga – 6µl

Track 3 – Siddhartaka yoga – 9µl

Table 1: R_f values of Siddhartaka yoga

Short UV	Long UV	After derivatisation
0.04 (Green)	-	-
0.06 (Green)	0.06 (F. blue)	0.06 (Purple)
0.13 (Green)	0.13 (F. blue)	0.13 (Purple)
0.17 (Green)	-	-
-	-	0.19 (Purple)
-	0.25 (F. blue)	0.25 (Purple)
-	0.34 (F. blue)	-
-	-	0.37 (Purple)
0.44 (Green)	0.44 (F. blue)	-
-	0.57 (F. blue)	-
-	0.63 (F. blue)	-
-	0.70 (F. blue)	0.70 (Purple)
-	0.76 (F. blue)	-

*D – dark; L – light; F – fluorescent

Figure 2. Densitometric scan of Siddhartaka yoga

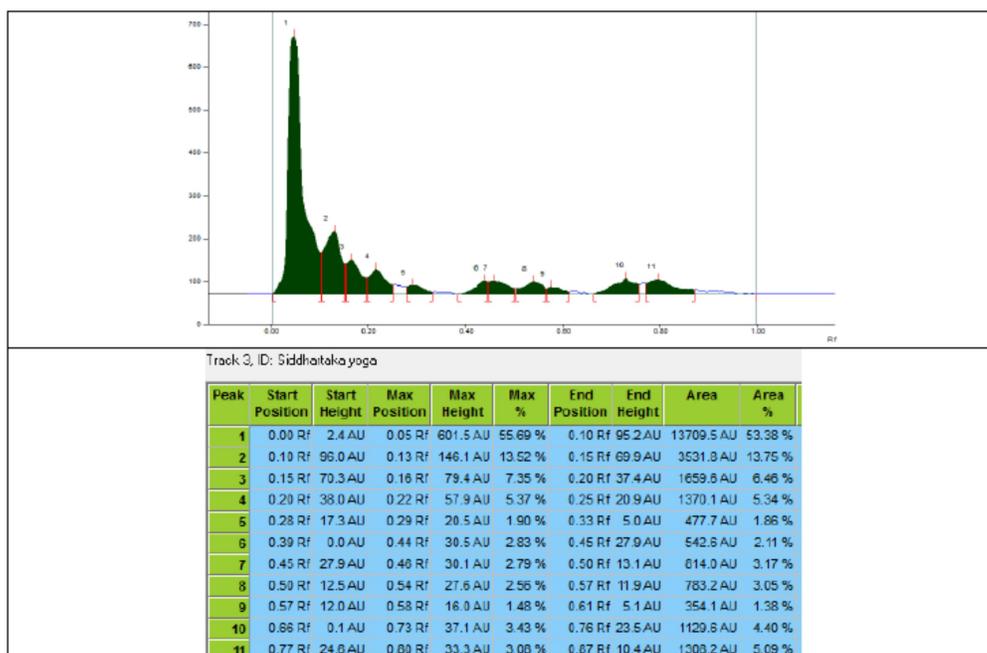


Fig 2a. At 254nm

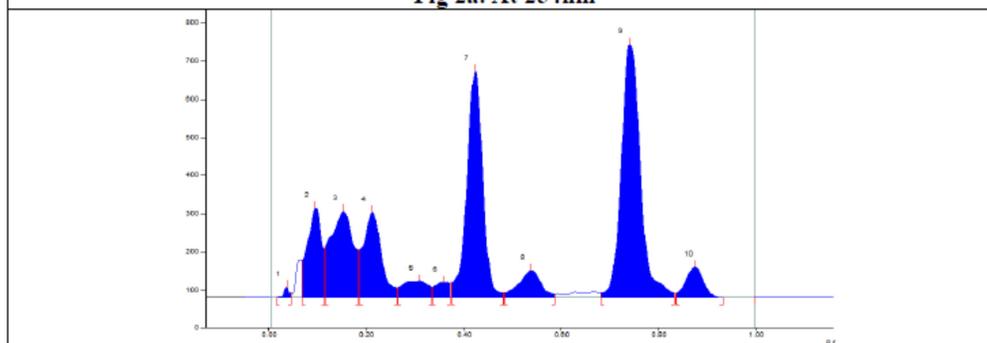


Fig 2b. At 366nm

Part D: Remarks

HPTLC photodocumentation, Rf values, densitometric scan of Siddhartaka yoga are mentioned in respective tables and figures.



ULR-TC546019000030862P
Test Report No. BLR/F(C/M)/19/027766
Dated 2019-09-26

S.NO.	PARAMETERS	TEST RESULT	SPECIFICATION	TEST METHOD
Metals & Minerals :				
1#	Mercury as Hg,mg/kg	0.59	Max 1.0	ICP-MS
2#	Cadmium as Cd,mg/kg	Below Limit of Quantification (LOQ : 0.2)	Max 0.3	ICP-MS
3#	Arsenic as As,mg/kg	Below Limit of Quantification (LOQ : 0.3)	Max 3.0	ICP-MS
4#	Lead as Pb,mg/kg	1.90	Max 10.0	ICP-MS

Figure 3

Microbiology :				
5	E.coli/g	Absent	Not Specified	Chapter <62>, USP 37
6	Pseudomonas aeruginosa,/g	Absent	Not Specified	Chapter <62>, USP 37
7	Salmonella,/10g	Absent	Not Specified	Chapter <62>, USP 37
8	Staphylococcus aureus,/g	Absent	Not Specified	Chapter <62>, USP 37
9	Total Bacterial Count,cfu/g	< 10	Not Specified	USP 62
10	Yeast & Mould Count,cfu/g	< 10	Not Specified	Chapter <61>, USP 37

† Tests subcontracted to other TUV SUD laboratory.

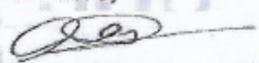
Remark: The sample conforms to API specification with respect to tested parameters only.

Authorised By



B. Manjunath
(Lab Manager)

Authorised By



Ganga Bhaskar
(Authorized Signatory - Microbiology)

- END OF TEST REPORT-



Figure 4

GAS CHROMATOGRAPHY TEST

GC is an analytical instrument used to analyse the different component in a sample. Term chromatography meant for separation. It is a process of separating components from the crude drug by using mobile phase. It involves a sample being

vaporized and injected onto the head of the chromatographic column.

Sample: U530

Parameter: General Profiling

Equipment Used: GCMS-CKL/ANL/E-028

Method: CKL/ANL/GC-003

GCMS

Instrument Model	7890 A GC with 5975C with triple axis detector		
Column	DB 5MS 30 m x 0.250mm Diameter x 0.25 Micro Meter Thickness		
GC Conditions			
Oven	Rate °C/min	Value °C/min	Hold Time
Initial		40	5
Ramp 1	5	100	10
Ramp 2	7	150	10
	5	280	5
Injection Mode- splitless			
Injection Volume	3 µL		
INJECTOR TEMP	280 °C		
Pressure	7.0699 psi		
Flow	1 mL/min		
Carrier Gas	Helium		
Injection Mode	Splitless		
Library	NIST 08 Spectral Data		
Ionization Temperature	80eV		
Sample storage	4°C		
Sample preparations	Sample dissolved in 5 ml methanol ,centrifuge at 3000 rpm ,filtered with syringe filter and Sample injected in GC.		

CONCLUSION

Any plant or formulation which is used medicinally requires detail study prior to its use because the therapeutic efficacy is depends on the quality of ingredients used for the medicine preparation. In this study, Siddhartaka Yoga was prepared according to the classical textual standard operative procedure mentioned in classic. The raw drugs were identified and authenticated before using for preparation. The prepared drug, Siddhartaka Yoga was pharmacologically subjected for

physicochemical analysis, HPTLC, heavy metal analysis and gas chromatography study of drug. The ground work requisites for the standardization of Siddhartaka Yoga were covered in this study. In future, this study will be helpful for standardization of Siddhartaka Yoga and for the preparation of the monography of Siddhartaka Yoga in the Ayurvedic Formulary of India (AFI). Sarshapa⁴ is main ingredient which has been used in Ayurveda both as food and as a medicine. Mustard leaf is considered a vegetable, while the seeds are used as a

spice and constitute the source of mustard oil. Mustard belongs to the Crucifereae family. Paryaya-katu, Sneha, Siddharta, Shubhragaura, Bhutaghna, Uragandha, Bhootanashanam Rakshoghna – keeps away from evil spirits. “A role of antioxidants in GAD and Depression”. Total patients taken 80. vitamin A, C, E given for 6 weeks of period. After 6 weeks significant reduction in anxiety and depression scores of patients was observed. Sources of antioxidants like onion, garlic, milk, meat, carrot etc. Results and conclusion the finding suggest that antioxidant supplement therapy as an adjuvant therapy is useful in patients with stress induced psychiatric disorders.⁵ To conclude the report of gas chromatography, it showed contents of Siddhartaka Yoga had anti-depressant action along with mood stabilizing, improvement in memory, physical and motor activity and cognition (thought process).

REFERENCES

- [1] Charaka Samhita with charaka Chandrika hindi commentary by Dr Brahmanand Tripathi and Dr Ganagasahay Pandey, Sutra Sthana chapter 9, verse 3, Chaukambha Surbharti Prakashan 2007 page 207.
- [2] Yogratakara, edited by Dr. Indradev Tripathi and Dr. Dayashankar Tipathi with

Vaidyaprabha Hindi commentary, Chaukamba Krishna Das Academy, Unmada chikitsa, page no.490.

- [3] Bhavamisha, Bhavprakasha, edited by Sri. Brahmasankara Mishra and Sri. Rupalalaji visya, The Khashi Sanskrit series 130, published by Chaukambha Sanskrit Sansthan, part-1, 66
- [4] Sujatha R, Srinivas L. Modulation of lipid peroxidation by dietary components. *Toxicol. In-vitro*. 1995; 9: 231–236. [[PubMed](#)] [[Google Scholar](#)]
- [5] M Gautam, M Agrawal, M Gautam. 2012 - ncbi.nlm.nih.gov 2012 Jul; 54(3): 244-7. doi: 10.4103/0019-5545.102424. PMID: [PMC351236](#)
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