

ANALYTICAL EVALUATION OF *SHADANGA GUGGULU*: AN AYURVEDIC FORMULATION USED IN AMAVATA

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ABSTRACT

Background: *Shadanga Guggulu* is mentioned in *Rasa Ratna Samucchaya*, indicated in *Vatavyadhi (Sparshvata-Raktavata-Amavata- Vatavyadhi Chikitsa Prakaran)*. So, for the initialization of standardization and assurance of the quality of herbal compounds Pharmacognostical and pharmaceutical analysis should be done. **Methods:** *Shadanga Guggulu* were subjected to microscopic evaluation for Pharmacognostical and physicochemical analysis, such as loss on drying, total ash, water soluble extract, alcohol soluble extract and pH value. **Results:** Pharmacognostical study showed the presence of certain identifying characters of all the ingredients of *Shadanga Guggulu Vati*. As per the preliminary physiochemical analysis, the loss on drying percentage of the *Shadanga Guggulu* was 97.24% w/w, the pH value was 6, the total ash value was 16.62 % w/w, Water soluble extractive was 6.91% w/w, and

Methanol soluble extractive was 11.1%w/w. **Conclusions:** Pharmacognostical and physicochemical observations revealed the specific characteristics of all active constituents of *Shadanga Guggulu Vati* confirmed the purity and genuinity of the drug.

KEYWORDS: *Shadanga Guggulu*, *Amavata*, Rheumatoid Arthritis, Pharmacognosy, Pharmaceutical analysis.

INTRODUCTION

On analyzing the ingredients of *Shadanga Guggulu*, a significant number of drugs have

Tikta- Katu Rasa, Laghu-Guna, Katu- Vipaka, Ushna –Virya properties, which act on impaired *Jatharagni* as well as *Dhatvagni*, which in turn lead to *Amapachana*, *Vata Kapha Shamana*, and thus corrects *Ama* at the level of *Jatharagni* and *Dhatvagni* too. *Vatari* (*Eranda*), one of the ingredients of *Shadanga Guggulu*, owing to *Snigdha Guna*, *Madhura Vipaka*, leads to the pacification of *Vata Dosha*. Further, due to its *Sukshma Guna* it penetrates micro channels and removes obstruction at the cellular level. *Katu Rasa* and *Ushna Virya* property of *Eranda* helps in normalizing of deranged *Agni*, as well as works as *Vata Shamaka*.^[1]

Moreover, most drugs have *Amapachaka*, *Deepaniya*, *Kapha-Vatahara*, *Shoolahara*, *Shothahara* effect which will break the pathogenesis of *Amavata*.

According to pharmacological studies done on ingredients of *Shadanga Guggulu*, most of the drugs possess antioxidant, Anti-inflammatory, Analgesic, and Immunomodulatory pharmacological actions, which might help reduce pain, inflammation, stiffness, and tenderness of joints and other constitutional symptoms of *Amavata*.^[2]

In the case of internal administration of a herbal drug, it should be safe, effective and free from adulteration, with appropriate quantity and ingredients. It is difficult to identify the herbal drug in dry or powdered form. So, there is a need for time to set proper parameters for the standardization of herbal drugs. Pharmacognostical studies reveal plant identification and set parameters for standardization which can be done in the case of herbal traditional medicine.

Generally, the physiochemical analytical study of drugs helps to interpret the pharmacokinetics and pharmacodynamics involved. With the help of physiochemical analytical studies, it is possible to standardize the drug and differentiate the adulterants. It is a necessity of time in the field of Ayurveda to go for quality control of the raw drugs as well as final products using modern parameters, which provides credibility to Ayurvedic medicines and also helps in the globalization of Ayurveda. Hence, to evaluate the Authenticity of *Shadanga Guggulu* through various Pharmacognostical procedures, and to develop the pharmacognostical and phytochemical profile of *Shadanga Guggulu*, the present study was carried out.

MATERIALS AND METHODS

Collection, identification and authentication of raw drugs.

The raw materials were procured from the pharmacy of ITRA Jamnagar, an authentic source and the raw drugs were identified and authenticated in the pharmacognosy laboratory of the Institute of Teaching and Research in Ayurveda, Ministry of Ayush, Gov. of India, Jamnagar. The ingredients and parts used in *Shadanga Guggulu Vati* are given in Table 1.

Table No. 1: Ingredients of *Shadanga Guggulu*.

Drug	Latin name	Family	Part Used	Proportion
<i>Rasna</i>	<i>Pluchea lanceolata</i> Oliver & Hiern	Compositae	Root	1Part
<i>Amruta</i>	<i>Tinospora cordifolia</i> (Willd) Miersex Hook.f. & Jhoms	Menispermaceae	Stem	1Part
<i>Devadaru</i>	<i>Cedrus deodara</i> (Roxb) Loud.	Pinaceae	Heartwood	1Part
<i>Shunthi</i>	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Rhizome	1Part
<i>Vatari (Eranda)</i>	<i>Ricinus communis</i> Linn.	Euphorbiaceae	Root	1part
<i>Suddha Guggulu</i>	<i>Commiphora mukul</i>	Burseraceae	Oleo gum Resin	5Part
<i>Go Ghrita (Cow ghee)</i>	-	-	-	Q.S.

Method of preparation of *Shadanga Guggulu*^[3]

All the raw materials for the drug under trial were procured from the pharmacy of I.T.R.A., Jamnagar. *Shadanga Guggulu* was prepared by the classical Method in the pharmacy of I.T.R.A., Jamnagar.

All ingredients of *Shadanga Guggulu*, i.e., *Rasna Churna* (1 part), *Amruta Churna* (1 Part), *Devadaru Churna* (1 part), *Shunthi Churna* (1 part), *Vatari Churna* (1part), and *Shuddha Guggulu* (5 parts) were collected. *Shuddha Guggulu* (5 parts) was boiled with water, then the other ingredients (each 1 part) in powder form were added to it and mixed properly in the liquid *Guggulu*. At last, *Ghee* (Q.S.) was added, and *Vati* of 500mg was prepared.

Pharmacognostical study

The pharmacognostical study was divided in to organoleptic study and a microscopic study of the finished product.

Organoleptic study: The genuinity of the polyherbal formulation can be found with the organoleptic characters of the given sample. Organoleptic parameters comprise colour, odour,

taste and touch of *Shadanga Guggulu* which was scientifically studied as per the standard references.

Microscopic study: *Shadanga Guggulu* ingredients were taken in powder form and dissolved with water, and microscopy of the sample was done without stain and after staining with phloroglucinol and HCl. Microphotographs of all ingredients, *Shadanga Guggulu*, were also taken under a Corl-Zeiss trinocular microscope.^[4]

Physico-chemical analysis-With the help of various standard physio-chemical parameters, *Shadanga Guggulu* was analyzed. The common parameters mentioned for *Shadanaga Guggulu* in Ayurvedic Pharmacopoeia of India, and CCRAS, guidelines are loss on drying, total ash, water soluble extract, alcohol soluble extract and ph value.

OBSERVATION AND RESULTS

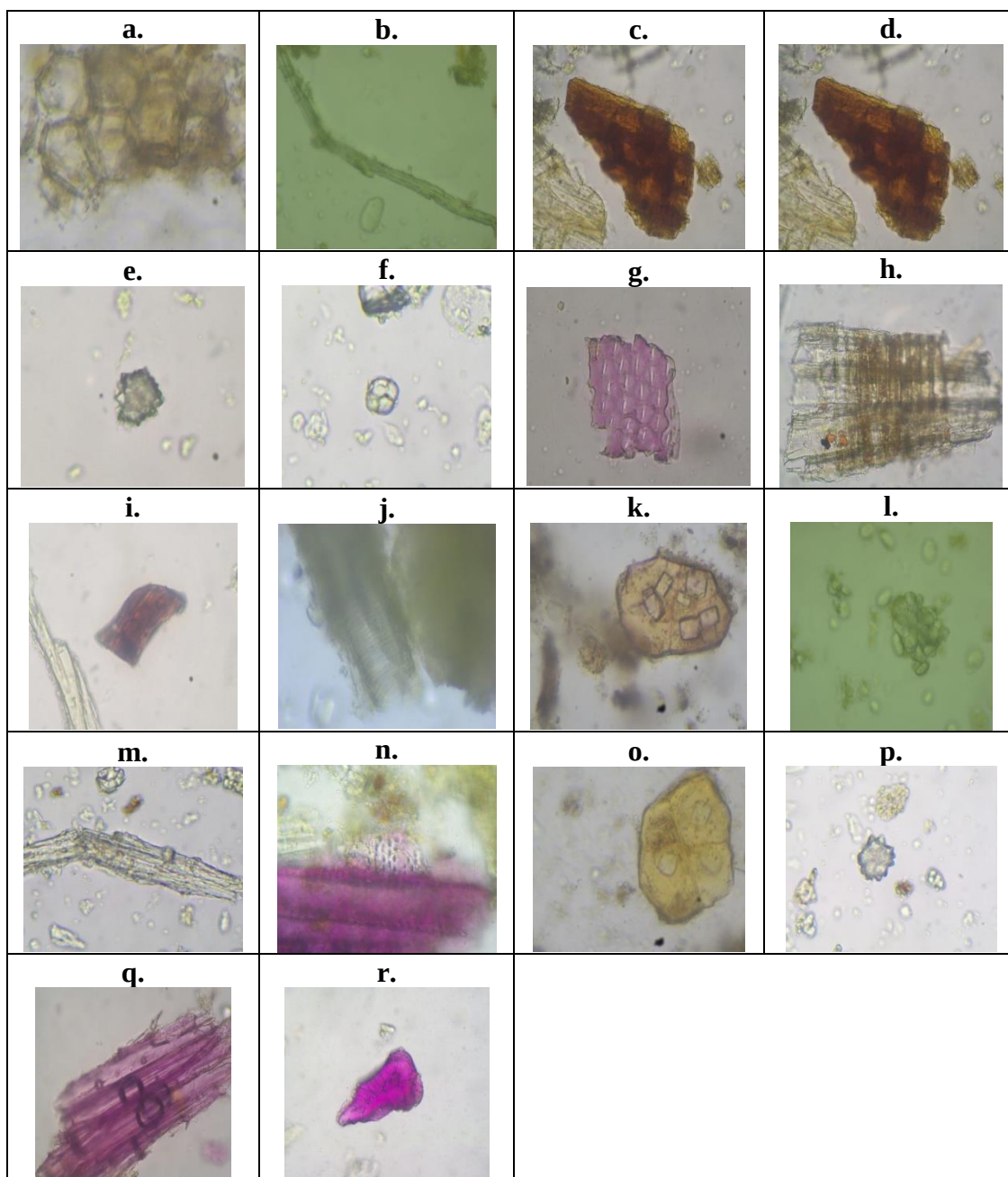
The initial purpose of the study was to confirm the authenticity of the drugs used in preparation of *Shadanga Guggulu*. For this, all ingredients were subjected to organoleptic and microscopic evaluations to confirm the genuineness of all the raw drugs. Later, after the preparation of the formulation, Pharmacognostical evaluation was carried out. Organoleptic evaluation of organoleptic features like colour, odour, and taste of *Shadanga Guggulu* were recorded and are placed in Table 2.

Table No. 2: Organoleptic characteristics of *Shadanga Guggulu*.

Sr. No.	Characters	Results
1	Color	Blackish brown
2	Odor	Characteristic
3	Taste	Astringent
4	Touch	Hard

Table No. 3: Microscopic Characteristic of *Shadanga Guggulu*.

a. Cork cells of <i>Guduchi</i>	b. Fibres of <i>Shunthi</i>
c. Brown content of <i>Erandamoola</i>	d. Prismatic crystal of <i>Devadaru</i>
e. Crystal of <i>Erandamoola</i>	f. Compound starch grain of <i>Rasna</i>
g. Pitted vessels of <i>Erandamoola</i>	h. Fibre passing through the medullary rays of <i>Devadaru</i>
i. Tannin content of <i>Devadaru</i>	j. Scleriform vessels of <i>Shunthi</i>
k. Lignified collenchyma cells of <i>Guduchi</i>	l. Starch grains of <i>Shunthi</i>
m. Fibres of <i>Rasna</i>	n. Pitted vessels of <i>Rasna</i>
o. Collenchyma cells of <i>Guduchi</i>	p. Rosette crystal of <i>Rasna</i>
q. Lignified fibres of <i>Erandamoola</i>	r. Stone cell of <i>Rasna</i>



Physio-chemical parameters: Physio-chemical parameters like Loss on drying, total ash, water soluble extract, alcohol soluble extract and ph value were found within the normal range. Details are shown in Table 4.

Table No. 4: Physio-Chemical Parameters of *Shadanga Guggulu*.

S.N.	Parameters	<i>Shadanga Guggulu</i>
1	Loss on drying	97.24%
2	Ash value	16.62%
3	Water-soluble extract	6.91
4	Methanol-soluble extract	11.1%
5	pH value	6
6	Hardness	7kg/cm ²

❖ No any heavy mental in this formulation.

❖ **Microbiological Study**

- Samples of *Shadanga Guggulu* were studied to check microbial contamination at different climatic conditions. The study was conducted at the Microbiology Laboratory, ITRA, Jamnagar, India.
- Preparation Time:
 - Drug was prepared under SOP with the utmost care to avoid any sort of contamination.
 - Date of preparation: *Shadanga Guggulu* - 16/07/2024
- **Microbial profile:** Microbial contamination was assessed by two methods to check for any mycological and bacteriological findings.

1. Smear Examination

- a. Wet mount / 10% K.O.H. Preparation
- b. Gram's stain

2. Culture Study

- a. Fungal culture
- b. Aerobic culture

Table No. 3.1.2.46: Showing observations of sample *Shadanga Guggulu*. Preserved at room temperature.

Sr. No.	Date of Sample given	Observations of the sample			
		Gram's Stain	Aerobic culture	Wet mount/ 10% KOH Preparation	Fungal culture
1.	14/10/2024	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
2.	11/11/2024	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
3.	11/12/2024	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
4.	16/01/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
5.	06/02/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
6.	17/03/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
7.	24/04/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
8.	28/05/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated

9.	30/06/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
10.	30/07/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated
11.	28/08/2025	Microorganisms Not Seen	No organisms isolated	Fungal filaments not seen.	No Fungal Pathogen Isolated

DISCUSSION

Study on *Shadanga Guggulu Vati* was a step towards Pharmacognostical and pharmaceutical standardization of the drug. The pharmacognostical study revealed the presence of the diagnostic characters *Shadanga Guggulu-like*. The diagnostic characters are *Guduchi-like* Cork cells, Collenchyma cells, and Lignified Collenchyma cells. *Erand moola* like pitted vessels, crystal, Lignified fibers, Brown content. *Sunthi* like Fibers, Scalariform vessels, Starch grains. *Rasna* like Fibers, Pitted vessels, Rosette crystal, Stone cell, Compound starch grain. *Devadaru* like Tannin content, Prismatic crystal, Fiber passing through medullary rays.

This confirms the presence of all ingredients of raw drugs in the final product, and there is no major change in the microscopic structure of raw drug during the pharmaceutical process of preparation of the final product. This shows the genuinity of the final product. All the physico-chemical parameters loss on drying percentage of the *Shadanga Guggulu* was 97.24% w/w, pH value of 6, total ash value was 16.62 % w/w, water-soluble extractive was 6.91% w/w, and Methanol soluble extractive was 11.1%w/w. Were analysed and found to be in normal referential range.

CONCLUSION

The pharmacognostical and physico-chemical analysis of *Shadanga Guggulu* confirmed the purity and genuinity of the drug. As no standard fingerprint is available for this formulation, an attempt has been made to evolve pharmacognostical and physico-chemical profiles of *Shadanga Guggulu*. Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

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