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PHARMACOGNOSTICAL, PHYSICOCHEMICAL AND HPTLC EVALUATION OF *AMRUTADHYA GUGGULU* A POLYHERBAL FORMULATION FOR PHARMACEUTICAL STANDARDIZATION

Divya Zala*[1], Dilip Prajapati[2], Anup Thakar[3], Harisha CR[4], V.J.Shukla[5]
[1]Ph.D. Scholar, Department of Panchakarma, [2]Ph.D. Scholar, Department of RS&BK, [3]Director of institute & Head, Dept. of Panchakarma, [4]Head, Pharmacognosy, [5]Head, Pharmaceutics, IPGT & RA, GAU, Jamnagar

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Corresponding author: Divya Zala
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ABSTRACT:
Background: Standardization of herbal formulation is needed in order to assess of quality of drug. Maintaining the quality standard of a polyherbal formulation is a difficult task. In the era of increasing demand for traditional medicines, maintaining quality standards is the need of the hour.
Aim: The present work was carried out to standardize the finished product *Amrutadhya Guggulu* to confirm its identity, quality and purity.
Material and Method: *Amrutadhya Guggulu* is mentioned in the treatment of *Sthaulya* (Obesity), and it was prepared according to the method as described in Chakradatta. *Amrutadhya Guggulu* powder was evaluated for its pharmacognostic and pharmaceutical analysis. It contains drug like *Guduchi, Ela, Kutaja Phala, Kutaj twaka* etc.
Result: Epicarp and stone cell of *Vidanga*, silica deposition of *Amalaki*, oil globule of *Ela* etc were the characteristic features observed in the microscopy of *Amrutadhya Guggulu* powder .Results found in pharmaceutical parameters of *Amrutadhya Guggulu* powder like Loss on drying8.07% w/w, Ash value 3.07% w/w, Water soluble extract 22.5 % w/w, alcohol soluble extract 13.44%w/w and pH 4
Conclusion: The Obtained values of all parameters for the finish product can be adopted to set down new standards.
Keywords: *Amrutadhya Guggulu,* HPTLC, Pharmacognostical, Pharmaceutical analysis

INTRODUCTION

The consideration of the drugs during the line of treatment for specific ailment has great importance. For using the drugs to treat a disease, it is necessary to have good quality drug with higher efficacy and safety. A drug that is not understood perfectly is comparable to poison, weapons, fire and the thunderbolt, while the perfectly understood drug is comparable to ambrosia.[1] Maintaining the quality standard of a polyherbal formulation is a difficult task. In the era of increasing demand for traditional medicines, maintaining quality standards is the need of the hour. Amrutadhya Guggulu is mentioned in Ayurvedic classics as a therapeutic formulation to treat Sthaulya.[2] Standardisation of polyherbal formulations is

lagging behind because of absence of reference standards. Therefore, proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics is essential to maintain the 'quality control' of multi-ingredient formulations. Amrutadhya Guggulu was subjected to various physico-chemical, HPTLC analysis and pharmacognostical study. All the experiments were done by following the standard procedures mentioned in Ayurvedic Pharmacopoeia of India.

Aim: To standardize the finished product Amrutadhya Guggulu to confirm its identity, quality and purity.

Materials and Method:

Collection and preparation of Drug

Stem of Guduchi, Ela, Bark of Kutaja, Guggulu and fruits of Vidanga, Kutaja, Haritaki, Amalaki and were collected from the Pharmacy, IPGT & RA, Jamnagar. Amrutadhya Guggulu is a polyhernbal formulation consisting of 8 ingredients which is mentioned in Chakradatta. Ingredients of Amrutadhya Guggulu are place in Table no 1. Amrutadhya Guggulu was prepared in the Department of Rasa Shashtra and Bhaishajya Kalpana, IPGT & RA, Jamnagar. Gomutra Shodhita Guggulu was melted on mild fire. Later on homogenous mixture of remaining 7 ingredients were added in melted Guggulu, mixed well and make a uniform mass mixture. Then this mass mixture was converted into pills and cut into the Vati, size of 500 mg with the help of pills cutting machine. Later on it was dried in hot oven and stored in air-tight container.

Table 1: Ingredients of *Amrutadhya Guggulu*

S. no	Drug	Latin Name	Part used	Quantity
1.	*Guduchi*	*Tinosporacordifolia* (Willd.)	Stem	1 Part
2.	*Ela*	*Elettariacardamomum* Maton	Seed	2 Parts
3.	*Vidanga*	*Embeliaribes* Burm. f.	Fruit	3 Parts
4.	*KutajaTwaka*	*Holarrhenaantidysenterica* Wall.	Bark	4 Parts
5.	*KutajaPhala*	*Holarrhenaantidysenterica* Wall.	Fruit	5 Parts
6.	*Haritaki*	*Terminalia chebula* Retz.	Fruit	6 Parts
7.	*Aamalaki*	*Embelica officinalis* Gaertn.	Fruit	7 Parts
8.	*Guggulu*	*Commiphoramukul* Engl.	Gum-resin	8 Parts

Pharmacognostical Study

1. Organoleptic Study

Powder characteristics of the finished product sample were identified with the help of Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, Gujarat, India.[3]

2. Powder microscopy

The powders of respective parts of all the ingredients studied separately and also finished product with and without staining covered with cover slip and observed under the Carl Zeiss Microscope. The microphotographs were taken by using Carl Zeiss binocular attached with camera.[4]

Pharmaceutical analysis:

Physico-chemical analysis *Amrutadhya Guggulu* was analyzed using various standard physico-chemical parameters such as Loss on drying, Ash value, Water soluble extract, alcohol soluble extract, pH.[5]

High Performance Thin Layer Chromatography (HPTLC)

High Performance Thin Layer Chromatography (HPTLC) was performed as per the guidelines provided by API.[6] A CAMAG (Switzerland) HPTLC system equipped with a sample applicator Linomat V was used for application of samples. The methanol extract of *Guggulu* powder was used for spotting. Toluene:ethylacetate:acetic acid (7:2:1 v/v) was selected as the solvent system. CAMAG TLC Scanner 3, Reprostar and Wincats 1.3.4 were used for scanning the plates. CAMAG twin trough glass chamber was used for developing the plates. The developed plate was visualized under visible daylight, short ultraviolet (UV) (254 nm), long UV (366 nm) and after spraying with vanillin-sulfuric acid reagent and again observed in daylight. The reference values were recorded. The colour and Rf values of resolved spots were noted.[7]

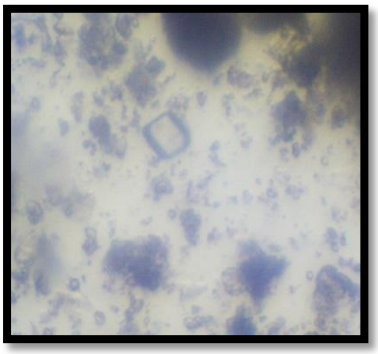
OBSERVATIONS AND RESULTS:

Organoleptic parameters: Organoleptic characters of *Amrutadhya Guggulu* powder such as colour, odour, taste etc. examined by sensory organs and results are shown in Table 2.

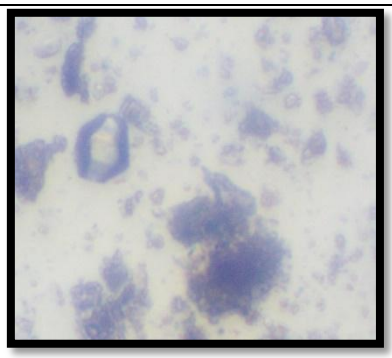
Table 2: Organoleptic character of *Amrutadhya Guggulu*

Sr no.	Organoleptic character	Results
1.	Colour	Brownish black
2.	Odour	Typical smell of cow urine
3.	Taste	pungent
4.	Touch	Hard
5.	Appearance	Tablet form

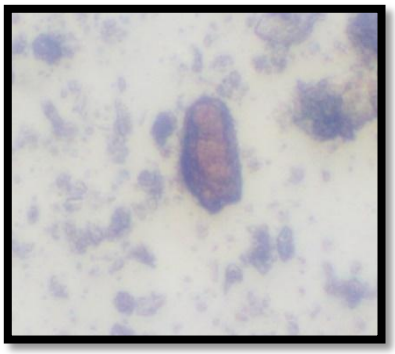
Powder Microscopy: Powder microscopy of all the ingredients of *Amrutadhya Guggulu* was studied, diagnostic characters are Prismatic crystal, Epicarp cell, oil globule of *Ela,* Epicarp cell, Stone cell, Lignified stone cell of *Vidanga*, Prismatic crystal, Rhomboidal crystal, Lignified stone cell of *Kutaja*, Sclereidal cell, Epicarp cell of *Haritaki,* Silica deposition, Fibers of *Amalaki,* Border pitted vessels, Collenchyma cells of *Guduchi* and Crystaline material of *Gomutra.* Microphotographs are placed at respective figures.[Plate-1 (Fig. 1-20)]



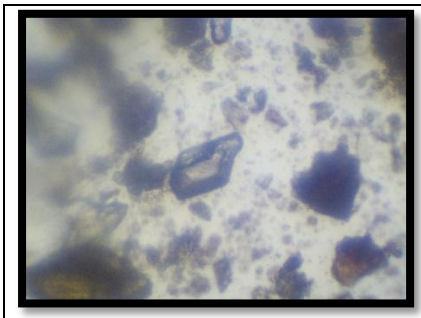
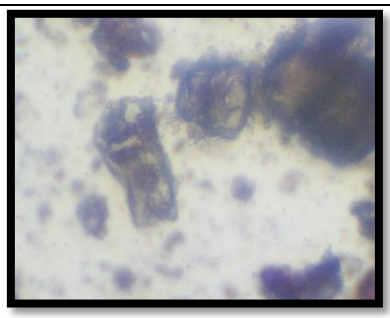
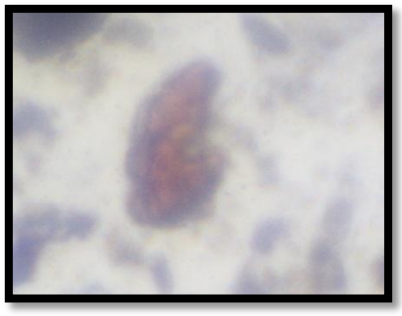
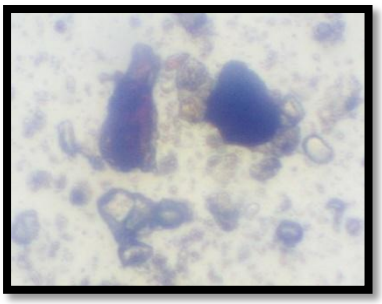
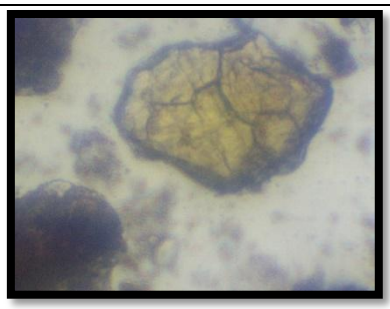
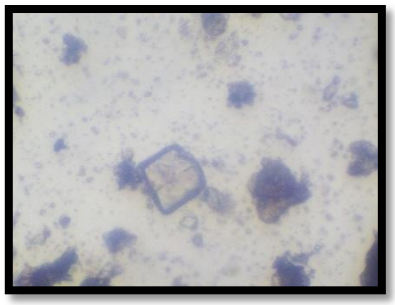
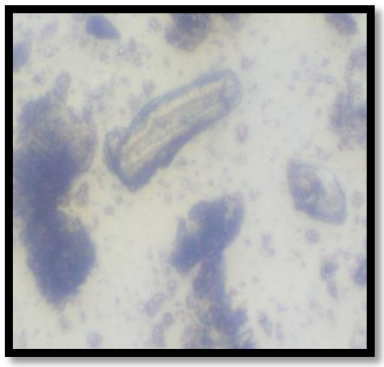
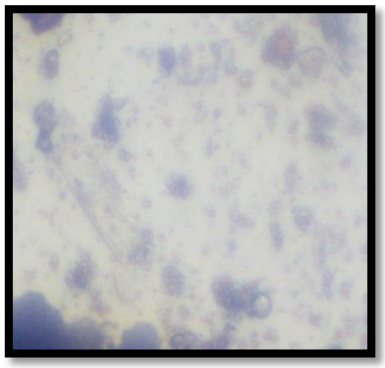
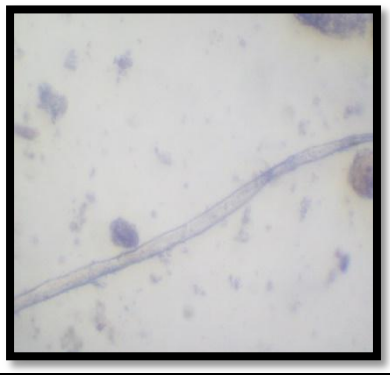
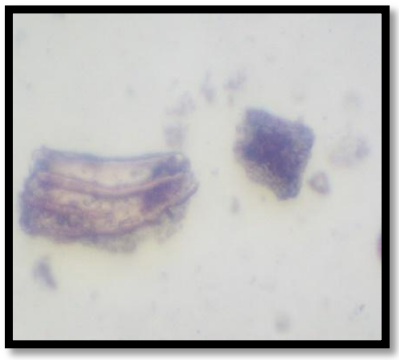
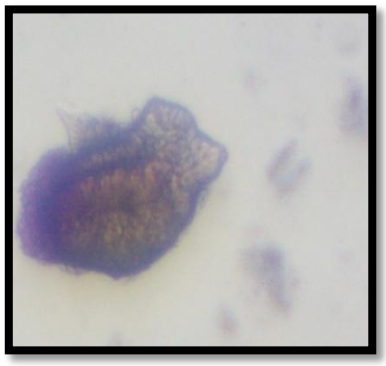
1.Prismatic crystal of *Kutaj*



2.Rhomboidal crystal of *Kutaj*



3.Coloring mater of *Vidanga*

		
4.Crystaline material of *Gomutra*	5. Epicarp cell of *Vidanga*	6. Stone cell of *Vidanga*
		
7.Silica deposition of *Amalaki*	8.Epicarp cell of *Haritaki*	9. Prismatic crystal of *Ela*
		
10.Epicarp cell of *Ela*	11. Sclereidal cell of *Haritaki*	12. Oil globules of *Ela*
		
13. Fibers of *Amalaki*	14. Lignified scleroids of *Haritaki*	15.Lignified stone cell of *Vidanga*

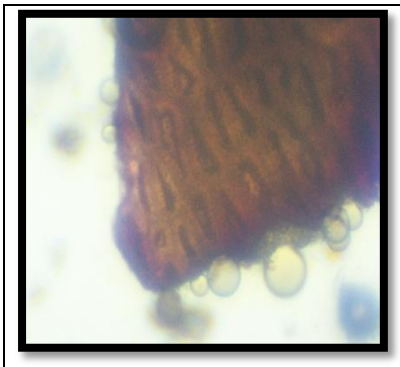
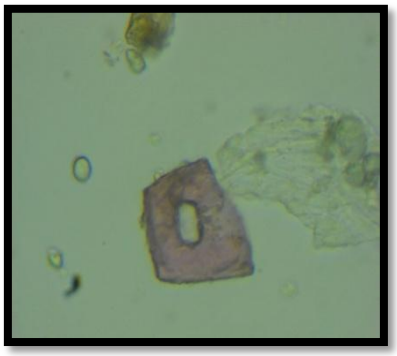
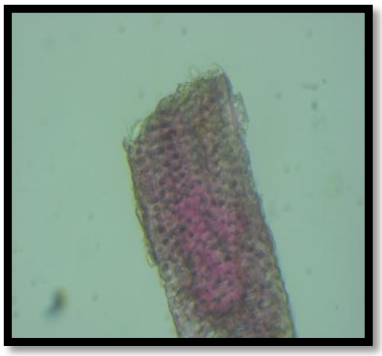
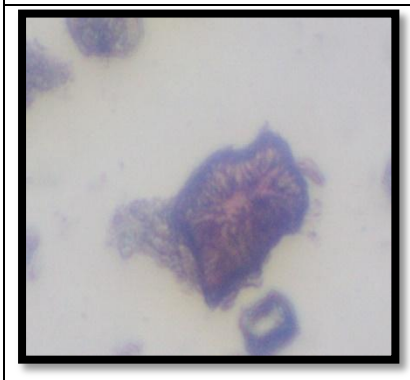
		
16. Epidermal cells with oil globules of *Ela*	17. Collenchyma cells of *Guduchi*	18. Border pitted vessels of *Guduchi*
		
19. Stone cell of *Vidanga*	20.Lignified stone cell of *Kutaja*	

Plate 1: Microscopic character of *Amrutadhya Guggulu*

Physicochemical parameters: Physicochemical parameters of *Amrutadhya Guggulu* such as loss on drying[8], Ash value[9], water soluble extracts[10], alcohol soluble extract[11] and pH[12] are shown in Table No 3.

Table 3: Physico-chemical parameters of *Amrutadhya Guggulu*

Sr no	Parameters	Results
1.	Loss on drying	8.07 % w/w
2.	Ash value	3.07
3.	Water soluble extract	22.5 % w/w
4.	Alcohol soluble extract	13.44 % w/w
5.	pH (5 % aqueous)	4

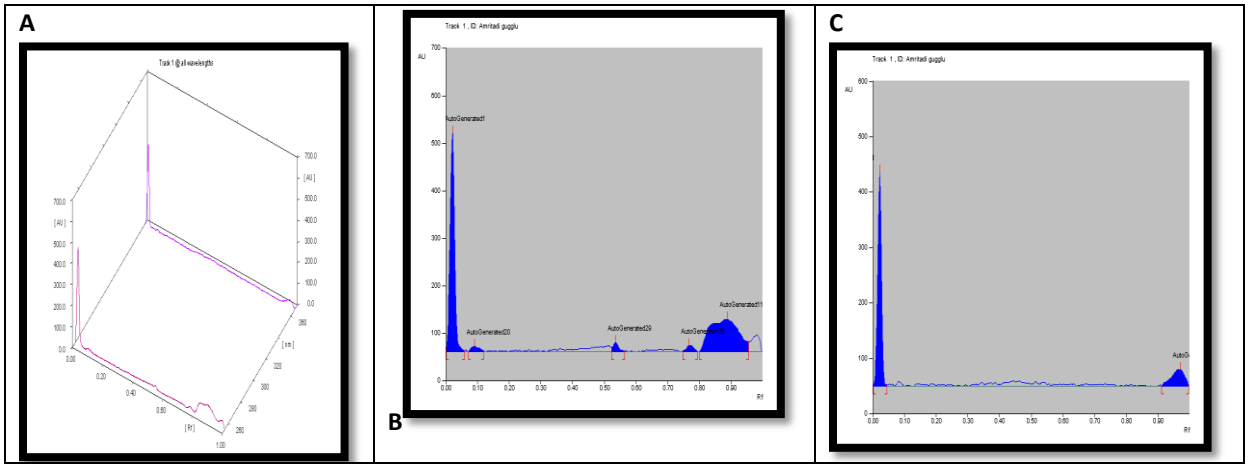
HPTLC

The chromatogram of *Amrutadhya Guggulu* showed 5 spots in short wave UV 254 nm and 02 spots obtained in long wave UV 366 nm. Table 4 [Plate 2 Fig.1-3]

Table 4: Chromatographic results of *Amrutadhya Guggulu*

Sr no	conditions	Rf values
1.	Short ultra violet (254nm)	0.02,0.09, 0.54,0.77, 0.89 (5 spots)
2.	Long ultra violet (366nm)	0.02, 0.97 (2 spots)

Plate 2: HPTLC evaluation of *Amrutadhya Guggulu*



(A) 3D Graph: 254nm & 366nm of *Amrutadhya Guggulu* (b) Chromatographic results (Peak display) of *Amrutadhya Guggulu* at Short ultra violet (254 nm), (c) Chromatographic results (Peak display)of *Amrutadhya Guggulu* Long ultra violet (366 nm)

Discussion:

Pharmacognostical outcomes confirm the ingredients present in the finished product which were present in the microscopically observed characters, this reflects the purity and quality of the product. The physicochemical analysis is inferred that the formulation meets maximum qualitative standards. All Physico-chemical parameters of *Amrutadhya Guggulu* are within limit and shows the product is of good quality and may provide better results for the desired indication used. HPTLC results showed the presence of 5 spots at 254 nm and 2 spot at 366 nm. On the basis of observations made and results of experimental studies, the study results may be used as the reference standard in further research undertakings of its kind.

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