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A PHARMACOGNOSTICAL AND PHYSICO-CHEMICAL ANALYSIS OF *ASANADI GHANAVATI*

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ABSTRACT

Background: *Asanadi Ghanavati* is *Asanadigana* mentioned in *Astanghridya*. It is formulated as a *Vati* preparation due to its easy palatability & long term storage. *Asanadi gana* has been indicated for the disease like *Shivitra, Kustha, Kapha, Krimi, Panduroga*, *Prameha* and *Medodosha*. The pharmacognostical and physico-chemical data is not published on *Asanadi Ghanavati* till date. Hence the present study was planned. **Aims:** To evaluate pharmacognostical and physico-chemical characters of *Asanadi Ghanavati*. **Materials & Methods:** Prepared drug was collected from pharmacy and authenticated in respective Laboratory of the institute. Standard procedures were followed to undertake the pharmacognostical and physico-chemical analysis. **Results:** Phrmacognostical results of *Asanadi Ghanavati* showed Lignified fibres of *Asana, Saal* and *Arjun,* border pitted vessel of *Khadir* & *Swetchandan,* Prismatic crystal of *Swetkhadeer & Daruharidra etc.* Physicochemical analysis *Asanadi Ghanavati* showed that weight variation 28.45%, Hardness 1.95kg/cm2 etc., In HPTLC, *Asanadi Ghanavati* revealed 12spots at 254nm and 12 spots at 366nm. **Discussion:** Pharmacognostical study with the help organoleptic characters like taste, odour, colour and touch along with microscopical characters and physico-chemical parameters to find out exact authentication of the ingredients present in the formulation. The presence of all raw content in final product shows the genuineness of the final product. **Conclusion:** As there is no reported study for the

standardization of the drug, the finding of the present study will be helpful as reference guidance for future scientific evaluations of the drug.

KEYWORDS: HPTLC, *Asanadi Ghanavati*, *Medodosha*, analysis, Physicochemical.

INTRODUCTION

The desirable effect of the medicine depends on the quality of its ingredients, so exact identification of original plant is essential. If the plant is adulterated, then the quality of prepared drug will not provide therapeutic effect. So, before using a drug it is necessary to identify raw materials at the basic level with the help of morphological and microscopic characteristics. *Asanadi Gana* is a specific herbal Formulation in *Astanga Hridaya*. The drugs are indicated especially for *Kapha* & *Medo* vitiated conditions like *Shwitra, Kushtha, Pandu, Prameha, Medoroga* etc. *Asana* (Pterocarpus Marsupium Roxb) belongs to Fabaceae family. The compounds of the Pterocarpus marsupium wood extract was found to be 3-0-Methyl-d-glucose (73.31%), n-Hexadecanoic acid (9.19%), 1, 2- Benzenedicarboxylic acid, diisooctyl ester (7.56%), Tetradecanoic acid (3.47%) and 9, 12-Octadecadienoic acid (z, z)-(2.49%). Pterocarpus Marsupium possessed Antihyperlipidemic[1], anti-diabetic[2], cardiac tonic[3], anti-inflammatory and anti-oxidant properties. It also has *Kapha-Pittahara*, *rasayana* and *Pramehahara* property. Karanja is having Hypolipidemic and hypoglycemic. These drug also have Anti-inflammatory, anti-hyperlipidemic, hypoglycemic, Cardiotonic, anti-atherogenic and anti-oxidant. Most of the drugs are having *Ruksha Guna, Kashaya Rasa, Katu Vipaka, Lekhana Chhedana* Karma. So, it may be useful *Kapha Medo Margavarana Janya Vyadhi* like *Santarpanjanya vyadhi* (Metabolic Syndrome). The pharmacognostical and physico-chemical data is not published on *Asanadi Ghanavati* till date. So, this study will be helpful

MATERIALS AND METHODS

Collection of Raw drugs and authentication

S*hinshapa* (*Dalbergia sissoo* Roxb.), *Sagwan* (*Tectona grandis* Linn), *Dhava* (*Anogeissus latifolia* Wall.) and *Taal* (Borassus flabellifer Linn.) were collected from the forest of Gir (Gujarat). *Bhurja* was collected from Uttrakhand. *Tinisha* (*Ougeinia dalbergioldes* Benth.) was collected from forest of Danga district in Gujarat. Rest of all drugs were obtained from the pharmacy department of the institute.

Preparation of the *asanadi Ghanavati*

Firstly, fine powder was made of all the contents of *Asanadigana*[4]. Each of above ingredients was taken in equal proportion as mentioned in Table-1 and *kwatha* was prepared. After filtration, the *kwatha* liquid was boiled further and then *Ghanavati* were prepared.

Pharmacognostical Evaluation[5]

Microscopic Study

The ingredients are identified and authenticated; formulation powder microscopy was done in the pharmacognosy department of the Institute. *Ghanavati* was broken and fine powder was dissolved in the distilled water then placed on slide adding with small quantity of water and examined under microscope without staining for the observation of cellular materials, then stained with Phloroglucinal and conc. Hcl[6] for the lignified characters. The microphotographs of diagnostic characters were taken by using Carl Zeiss trinocular microscope.[7]

Organoleptic Study

Asanadi Ghanavati was evaluated for organoleptic characters like taste, odour and colour, touch.[8]

Physico-Chemical Analysis

Physico-chemical Parameters of *Asanadi Ghanavati* like weight variation, Hardness, Disintrigation time, Loss on drying, Ash value, Acid insoluble ash, water soluble extract, Alcohol soluble extract, and pH were determined as per the API guideline.[9]

HPTLC

Methanol extract of *Asanadi Ghanavati* was used for High performance thin layer chromatography (HPTLC) study. Methanol extract of *Asanadi Ghanavati* was spotted on pre-coated silica gel GL60254 aluminium plate as 10mm bands by means of a Camag Linomate V sample applicator fitted with a 100µL Hamilton syringe. Toluene (9ml) and ethyl acetate (1ml) was used for *Asanadi Ghanavati* as a mobile phase. The development time was 30minutes. After development, Densitometry scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of Win CATS software (V1.2.1. Camag).[10]

OBSERVATIONS AND RESULTS

Pharmacognostical Evaluation

Organoleptic characters of *Asanadi Ghanavati*

Result of organoleptic characters of *AsanadiGhanavati* is shown in table 2.

Microscopic Study of *Asanadi Ghanavati*

The diagnostic microscopical characters of sample showed Border pitted vessels of *Khadir*, Border pitted vessels of *Chandan*, Rhomboidal crystal of *Agaru*, Cluster crystal of *Tinish*, Cork cells of *Kutaj*, Cork cells of *Shak*, Crystal fibre of *Shak*, Crystal fibre of *Shimshapa*, Crystal fibre of *Tinish*, Fibres of *Swethkhadir*, Lignified fibres of *Chandana*, Lignified fibres of *Saal*, Lignified fibres of *Asana*, Oil globules of *Karanjbeej*, Oil globules of *Bhurjapatra*, Prismatic crystal of *Dharuharidra*, Rhomboidal crystals of *Palash*, Trichome of *Meshashringi*, Stone cells of *Puga*, Rhomboidal crystal of *Shirish*, Fibres passing through medullary rays of *Asana*. (Plate-1, Figure 1–21).

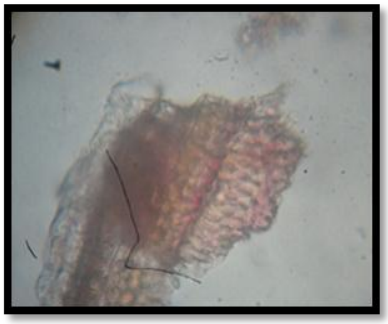
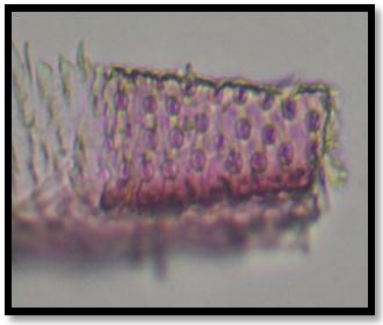
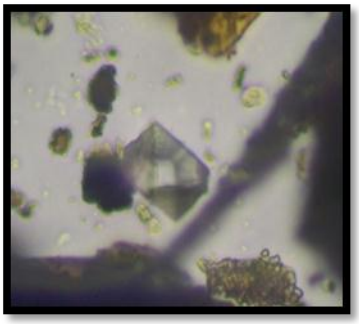
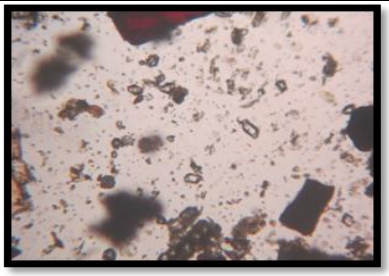
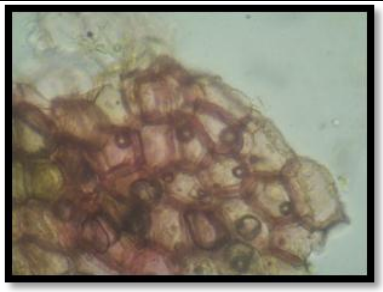
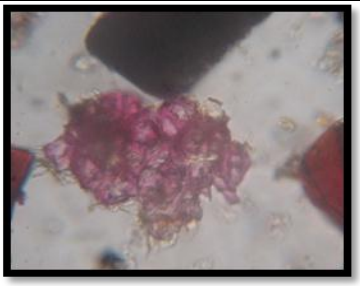
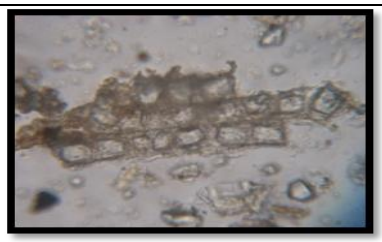
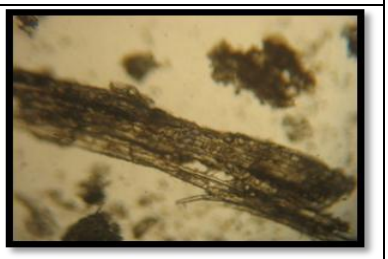
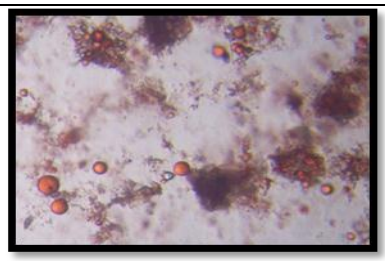
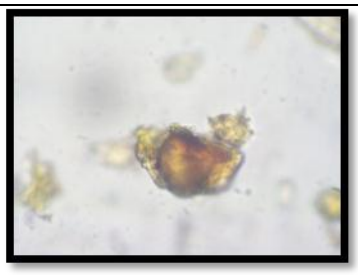
Physicochemical results

Physicochemical analysis of *Asanadi Ghanavati* revealed the weight variation 40.44%, Hardness 4.4kg/cm^2, loss on drying 6.91%, Ash value 19.98% w/w, Acid insoluble ash 4.22%, water soluble extract was 5.88%, Alcohol (Ethanol) soluble extract 5.7% and PH Value 6.5 (Table- 3).

HPTLC study results

Chromatographic study (HPTLC) was carried out under 254 and 366nm UV to establish fingerprinting profile. It showed 12 spots at 254nm with R_f values and 12 spots at 366 nm with R_f values recorded which may be responsible for expression of its pharmacological and clinical actions. Among 2 spots are common in both. (Plate-2 & 3, Table- 4).

Plate1

Microphotographs of *Asanadi Ghanavati* (Figure 1-21)		
 **Border pitted vessels of Khadir**	 **Border pitted vessels of Chandan**	 **Rhomboidal crystal of Agaru**
 **Cluster crystal of Tinish**	 **Cork cells of Kutaj**	 **Cork cells of Shak**
 **Crystal fibre of Shak**	 **Crystal fibre of Shimshapa**	 **Crystal fibre of Tinish**
 **Fibres of Swethkhadir**	 **Lignified fibres of Chandana**	 **Lignified fibres of Saal**
 **Lignified fibres of Asana**	 **Oil globules of Karanjbeej**	 **Oil globules of Bhurjapatra**

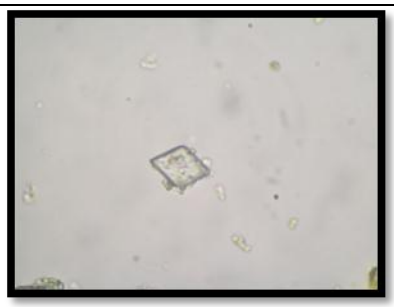
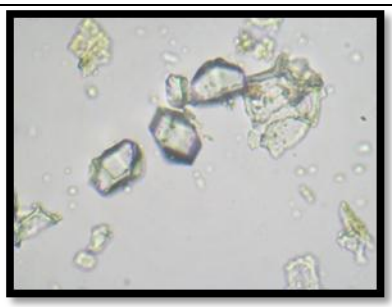
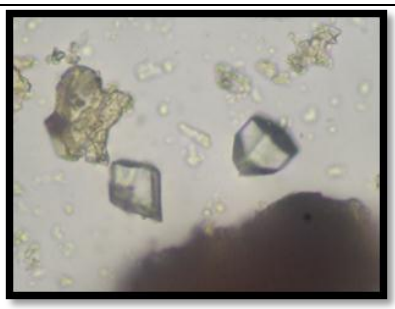
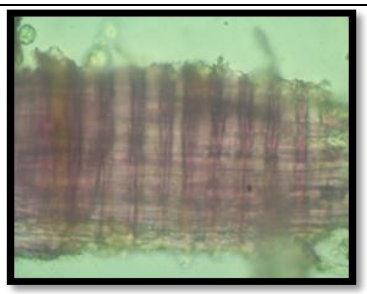
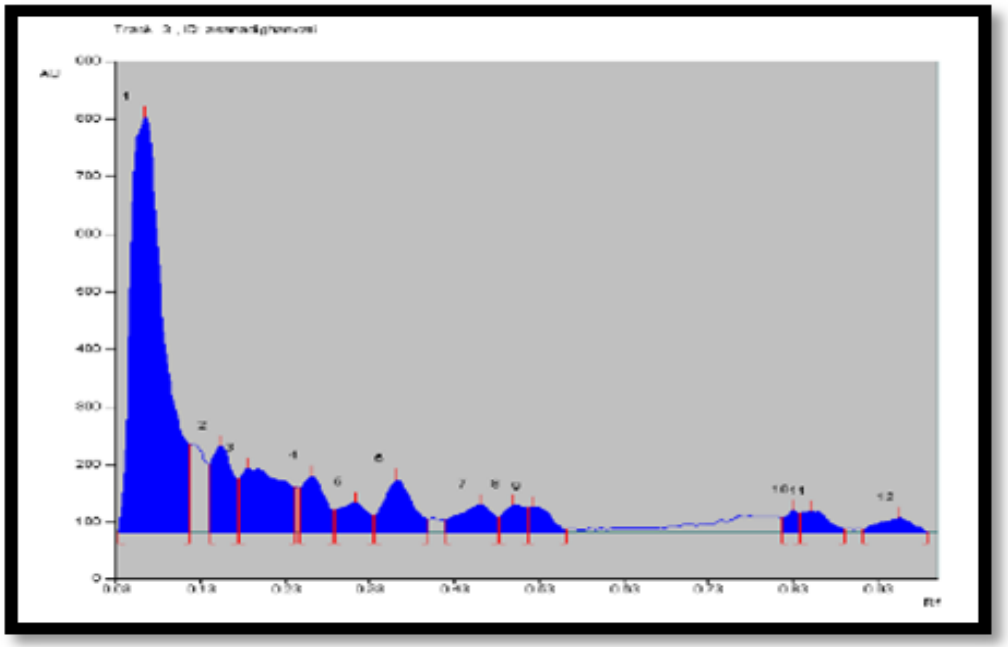
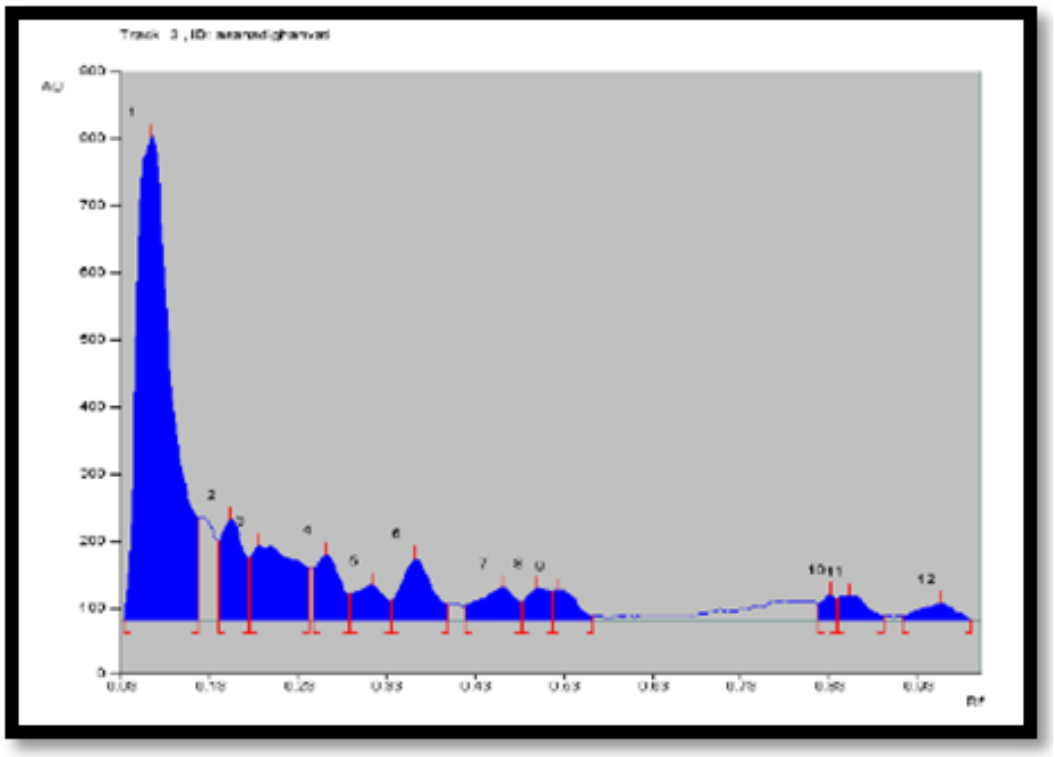
 **Prismatic crystal of Dharuharidra**	 **Rhomboidal crystals of Palash**	 **Trichome of Meshashringi**
 **Stone cells of Puga**	 **Rhomboidal crystal of Shirish**	 **Fibres passing through medullary rays of Asana**

Plate 2&3 Densitogram of *Asanadi Ghanavati*



At 254nm



At 366nm

Table 1: Ingredients of *Asanadi Ghanavati*.

Sr. No.	*Drugs*	Botanical Name	Part to be used	Proportion
1	*Asana*	*Pterocarpus marsupium* Roxb.	Heartwood	1 Part
2	*Shwetvaha-Arjuna*	*Terminalia arjuna* (Roxb.) W&A	Bark	1 Part
3	*PrakiryaKaranja*	*Pongamia glabra* Vent	Seed	1 Part
4	*Khadira*	*Acacia catechu* Willed	Heartwood	1 Part
5	*Kadar*	*Acasia suma* Kurz	Heartwood	1 Part
6	*BhandiraShirisha*	*Albizia lebbeck* Benth.	Bark	1 Part
7	*Meshsrngi*	*Gymnema sylvestre* R.Br	Leaf	1 Part
8	*Swet- Chandana*	*Santalum album* Linn.	Wood	1 Part
9	*Rakta-chandana*	*Pterocarpus santalinus* linn f.	Wood	1Part
10	*Daruharidra*	*Berberis aristica* DC.	Wood	1 Part
11	*Palasa*	*Butea frundosa* koen ex Roxb.	Seed	1 Part
12	*Kalinga*	*Holarrena antidysentrica* Wall.	Stem bark	1 Part
13	*Supari*	*Areca catechu* Linn.	Fruit	1 Part
14	*Tinisha*	*Ougenia dalbergioides* Benth.	Bark	1 Part
15	*Bhurja*	*Betula utilis* D.Don	Bark	1 Part
16	*Sinsipa*	*Dalbergia sissoo* Roxb	Wood	1 Part
17	*Tala*	*Borassus flabellifer* Linn.	Inflorescence	1 Part
18	*Agaru*	*Aqualaria agallacha* Roxb.	Wood	1 Part
19	*Sagwan*	*Tectona grandis* Linn.	Fruit	1 Part
20	*Saal*	*Shorea robusta* Gaertn.f.	Extract	1 Part
21	*Dhava*	*Anogeissus latifolia* wall.	Bark	1 Part

Table No 2: Ingredients of Asanadi Ghanavat.

Organoleptic characters of *Asanadi Ghanavati Vati*				
Name of Drug	**Colour**	**Taste**	**Odour**	**Nature of powder (Touch)**
Asanadi Ghanavati	Muddy brown	Slightly aromatic	Astringent	Hard

Table No3: Physico-chemical evaluation of *Asanadi Ghanavati.*

Sr. No.	Name of the Analysis	Values
1	Weight variation	40.44%
2	Hardness	4.4 kg/cm^2
4	Loss on drying in percentage	6.91%
5	Ash value in percentage	19.98%
6	Acid insoluble Ash	4.22%
7	Water soluble extract in percentage	5.88%
8	Alcohol (Ethanol) soluble extract in percentage	5.7%
9	PH Value 5% aqueous	6.5

Table No 4: HPTLC of *Asanadi Ghanavati.*

254nm		366nm	
No of spots	**R_f**	**No of spots**	**R_f**
12	0.03, 0.12, 0.16, 0.28, 0.34, 0.38, 0.45, 0.48, 0.47, 0.72, 0.76, 0.82	12	0.03, 0.14, 0.17, 0.24, 0.29, 0.33, 0.42, 0.48, 0.52, 0.81, 0.84, 0.91

DISCUSSION

Pharmacognostical study helps for exact authentication of ingredients present in formulation through its organoleptic characters like taste, odor, color and touch along with microscopical characters and physico-chemical parameters. This can prevent the accidental misuse of drugs and adulteration to a greater extent. The present pharmacognostical study revealed the presence of Border pitted vessels of *Khadir*, Border pitted vessels of *Chandan*, Rhomboidal crystal of *Agaru*, Cluster crystal of *Tinish*, Cork cells of *Kutaj*, Cork cells of *Shak*, Crystal fibre of *Shak*, Crystal fibre of *Shimshapa*, Crystal fibre of *Tinish*, Fibres of *Swethkhadir*, Lignified fibres of *Chandana*, Lignified fibres of *Saal*, Lignified fibres of *Asana*, Oil globules of *Karanjbeej*, Oil globules of *Bhurjapatra*, Prismatic crystal of *Dharuharidra*, Rhomboidal crystals of *Palash*, Trichome of *Meshashringi*, Stone cells of *Puga*, Rhomboidal crystal of *Shirish*, Fibres passing through medullary rays of *Asana* these all are the common characters of the ingredients present in formulation. The presence of all contents of raw drugs in the final product shows the genuinity of the final product. All the pharmaceutical parameters analyzed showed values permissible for the *Ghanavati*. The Physicochemical Parameters show that percentage of water soluble material is more than alcohol soluble extract. It also

showed presence of acidic nature of *Ghanavati* which will be helpful to improve the *Jatharagni* (digestive fire). Thus it can be inferred that the drug may yield desired pharmacological action. HPTLC is the most common form of Chromatographic method used by *Ayurvedic* researchers to identify the number of ingredients present in a formulation. It also helps to determine the purity of the sample.

CONCLUSION

The Microscopic pictures of the ingredients present in formulation and all the previously described organoleptic characters, these all are the striking characters of all ingredients presents in *Asanadi Ghanavati* (mentioned in above table-1) and all previously described physicochemical parameters showed within permissible limits. For the standardization of the drug, the finding of the study will be helpful as there are no reported study on the *Asanadi Ghanavati* and study might help as reference guidance for future scientific evaluations and authentications of the drug.

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