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Comparative Pharmacognostical and Physico-Chemical Analysis of *Asandighana Churna* With *Asanadi Ghanavati*

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Abstract

Background: *Asanadi Churna* is having 21 contents mentioned in *Astanghridya* as an *Asanadigana*. *Asanadi Gana* is advocated for *Shivitra, Kustha, Kapha, Krimi, Panduroga*, *Prameha* and *Medodosha Shamak* property. The pharmacognostical and physico-chemical data is not published on *Asanadi Churna* compared with *Asanadi Ghnavti* yet, So, this study is planned. **Aims:** To evaluate compare Pharmacognostical and physico-chemical characters of *Asanadi Churna* with *Asanadi Ghnavti.* **Materials and Methods:** Prepared drug was collected from pharmacy and authenticated in respective Laboratory of I.P.G.T. & R.A., G.A.U. Standard procedures were followed to undertake the pharmacognostical and physico-chemical analysis. **Results:** Phrmacognostical results of *Asanadi Churna* showed Lignified fibres of *Asana*, *Saal* and *Arjun,* border pitted vessel of *Khadir* and *Swetchandan* whereas *Vati* also showed similar characters. Physicochemical analysis *Asanadi Churna* showed at Loss on drying 0.48 %, Ash value 4.82% etc., In HPTLC, *Asanadi Churna* revealed 11 spots at 254 nm and 11 spots at 366 nm. Whereas *Asanadi Vati* showed that Loss on drying 6.91%, Ash value 19.98 % etc., In HPTLC *Asanadi Ghanavati* revealed 12 spots at 254 nm and 12 spots at 366 nm. **Discussion:** Pharmacognostical study with the help of microscopical characters and physico-chemical parameters to find out exact authentication of the ingredients present in formulation. The presence of all contents of raw drugs in the final product shows the genuinely of the fine duct. **Conclusion:** For the standardization of the drug, finding of the study will be helpful as there are no reported studies on the comparative *Asanadi Churna* and *Asanadi Ghanavati* and study might help as reference guidance for future scientific evaluations of the drug.

Keywords
HPTLC, *Asanadi Churna*, *Medodosha, Prameha,* analysis, Physicochemical.

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INTRODUCTION:

Diabetes mellitus is a group of metabolic diseases characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It is classified as type 1, and type 2 diabetes. In 21st century, Because of invention of newer technology, men's life has become more mechanical and having less effort to do anything. Amongst many dreadful conditions arising because of modern-day living, Diabetes Mellitus (DM) is a giant disease

considered as one of the archenemies of the humankind caused by improper diet and lifestyle. It is often referred as a "silent killer."

Globally, an estimated 422 million adults are living with diabetes mellitus; according to the latest 2016 data from the world health organization (WHO) [i] Diabetes prevalence is increasing rapidly previous 2013 estimates from the International Diabetes Federation put the number at 381 million people having diabetes.[2]

In Ayurveda disease diabetes mellitus can be correlated with *Prameha /Madhumeha*. It is *Tridoshaja* in origin with predominance of *Kapha***.** luxurious lifestyle, overuse of milk and milk products and jaggery products, lack of physical work and K*apha Dosha* enhancing factors etc are the major causative factors *(Nidana) for Prameha. Sahaj* and *Apathya Nimattaja* varieties of *prameha*. All these factors described in different texts of Ayurveda implies that lifestyle plays an important role in development and progression of *Prameha. Madhumeha* has been described among *Mahagada* which can be manageable but not curable.

There is variety of *Prameha* has been explained, but in all the conditions *Meda*, *Mamsa*, *Kleda* as well as *Kapha* predominance *Tridosa* vitiation has been considered as primary culprit. In same manner, in spite of mentioning 20 varieties of diseases, when management comes in picture, only 2 types of management i.e. for *Sthula* and *Balavan* patient *Samsodhana* / by *Karshana* and for thin and weak patient *Bringhana* is narrated. It shows that for Management of Diabetic patients, BMI also matters. For the first time comparative pharmacognostical and physico-chemical analysis of *Asandi churna* along with *Asanadi Ghana Vati* has been evaluated.

MATERIALS AND METHODS

Collection of Raw drugs and authentification:

The raw drugs were obtained from the pharmacy department, GAU, Jamnagar. *Bhurja* collected from Uttrakhand and rest of the drug procured from southern part of Gujarat. The ingredients, useful part and ratio of drug are mentioned in Table- 1.

Preparation.

Firstly, each of above ingredients were taken in equal proportion and cleaned and dried properly. They are finely powdered and sieved After then all mixed together. Parts of individual drugs are mentioned in Table-1.

Pharmacognostical Evaluation:

Microscopic Study:

The ingredients identified and authenticated, formulation *Churna* and *Vati* microscopy was done in the pharmacognosy lab. The study includes organoleptic evaluation and microscopic evaluation[ii]. Fine powder was taken then examined under microscope without staining for the observation of cellular materials, then stained with Phloroglucinal and concentrated HCl [3] for the lignified characters. Raw drugs were separately studied under microscope; the microphotographs of diagnostic characters were taken by using Carl Zeiss trinocular microscope[4].

Organoleptic Study.

Asanadi Churna and *Asanadi Vati* were evaluated for organoleptic characters like taste, odour and colour, touch[5].

Physico-Chemical Analysis.

Physico-chemical Parameters of *Asanadi churna* and *Asanadi Vati* like weight variation, Hardness, Disintrigation time, Loss on drying, Ash value, water soluble extract, Alcohol soluble extract, and pH were determined as per the API guideline[6].

HPTLC.

Methanol extract of *Asanadi Churna* and *Asanadi Vati* was used for High performance thin layer chromatography (HPTLC) study. Methanol extract of *Asanadi Churna* 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 100 µL Hamilton syringe. Toluene (9ml) and ethyl acetate (1ml) was used for *Asanadi Ghanavati* as a mobile phase. The development time was 30 minutes. 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)[8]

OBSERVATIONS AND RESULTS

Pharmacognostical Evaluation.

Organoleptic characters

Organoleptic characters of contents of *Asanadi Churna* and *Asanadi Vati* like colour, taste odour and touch were recorded separately and are mentioned. (Table-2).

Microscopic Study.

The diagnostic microscopical characters of sample showed Tannin contain of *Khadir,* Rosette Crystal of *Arjun*, Rhomidal crystal of *Agaru*, Soleriode of *Tinish,* Starch grain of *Kutaj*, Prizmetic Crystal of *Shak*, Border ticted vessels of *Sweta Chandana,* Pitted Stone cell of *Shimshapa*, Crystal fibre of *Tinish*, Fibres of *Swethkhadir*, Lignified fibres of *Saal,* Lignified fibres of *Asana*, Oil globules of *Karanjbeej*, Prismatic crystal of *Dharuharidra*, Rhomboidal crystals of *Palash*, Trichome of *Meshashringi*, Epicarp cell of *Puga*, Lignified Stone cell of *Shirish*, Fibres passing through medullary rays of *Asana* are shown in Plate-

1. (Figure 1–21). *Asanadi Ghanavati* showed similar character as *Asanadi Churna.*

Physicochemical results:

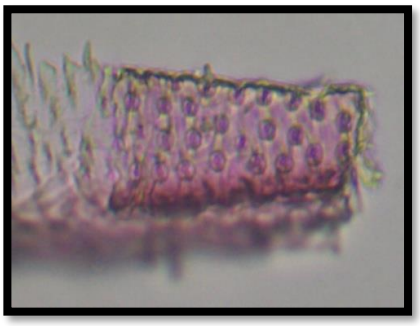
Physicochemical analysis of *Asanadi Churna* revealed loss on drying 0.48%, Ash value 4.82% w/w, water soluble extract was 14.1%, Alcohol (Ethanol) soluble extract 1.8% and PH value 6.5. Physicochemical parameters of *Asanadi Churna* & *Asanadi Vati* are shown below. (Table- 3).

HPTLC study results.

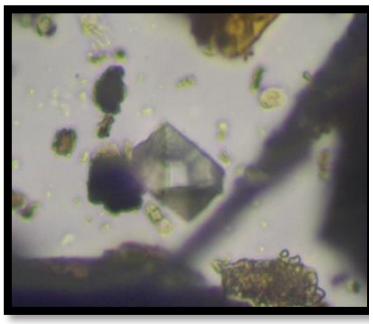
Chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish fingerprinting profile. It showed 11 spots at 254 nm with R_f values and 11 spots at 366 nm with R_f values recorded which may be responsible for expression of its pharmacological and clinical actions. Among 2 spots are common in both. HPTLC of *Asanadi Churna* and *Asanadi Vati* both have same characters as shown below. (Plate-2 & 3, Table- 4).

Plate 1: Microphotographs of *Asanadi Churna* (Figure 1-21)

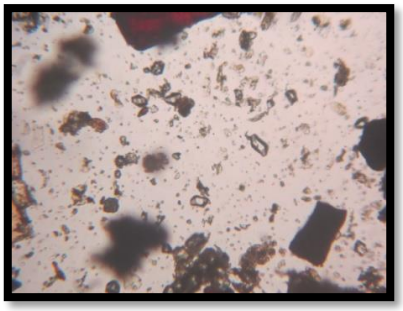
Asanadi Churna



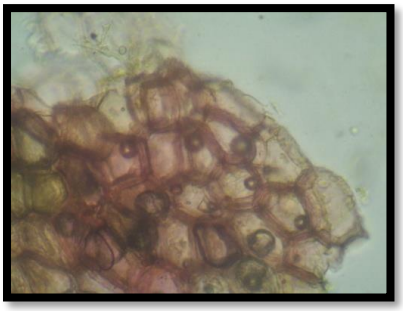
Border pitted vessels of Chandan



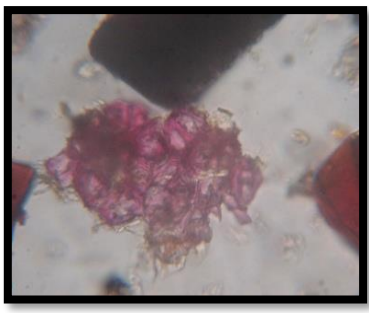
Rhomboidal crystal of Agaru



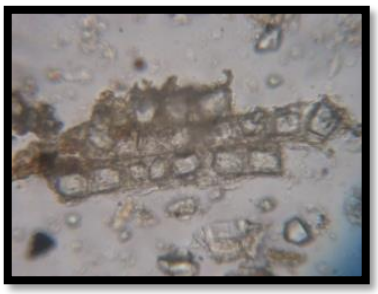
Cluster crystal of Tinish



Cork cells of Kutaja



Cork cells of Shak



Crystal fiber of Shak

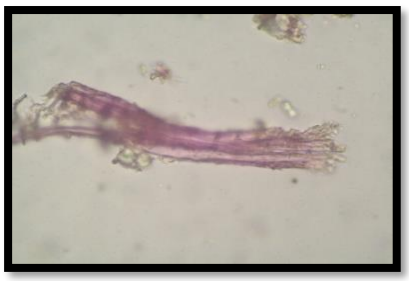
Crystal fibre of Shimshapa

Crystal fiber of Tinish

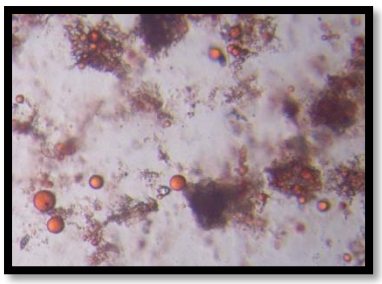
Fibers of Swethkhadir

Lignified fibers of Chandana

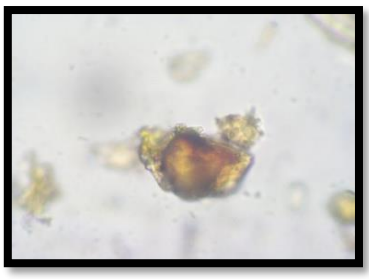
Lignified fibers of Saal



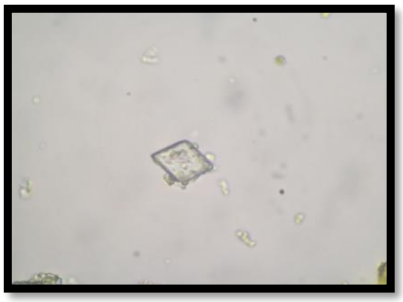
Lignified fibers of Asana



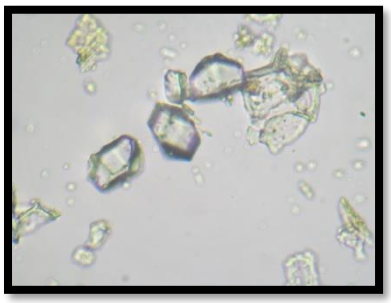
Oil globules of Karanjbeeja



Oil globules of Bhurjapatra



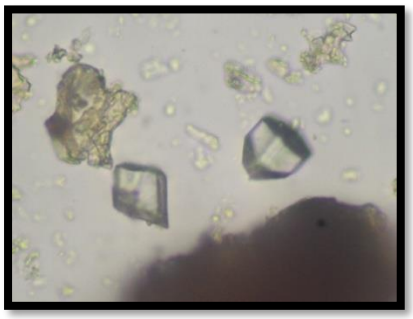
Prismatic crystal of Dharuharidra



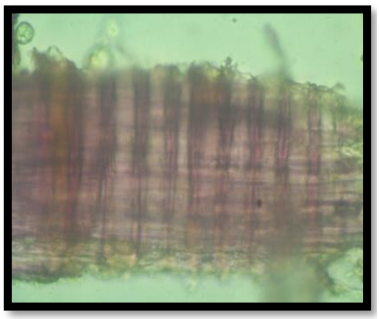
Rhomboidal crystals of Palash

Trichome of Meshashringi

Stone cells of Puga



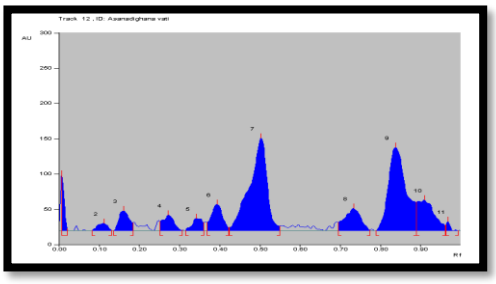
Rhomboidal crystal of Shirish

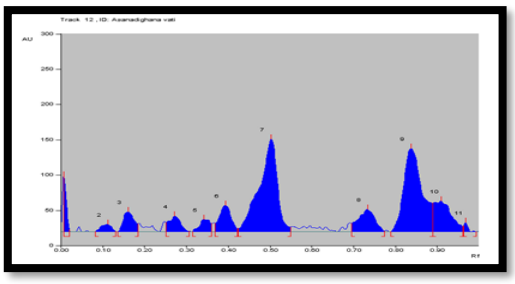


Fibers passing through medullary rays of Asana

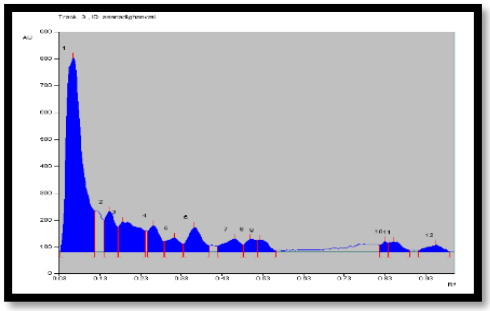
Plate 2&3: Comparative Densitogram

At 254nm **At 366nm**





Densitiogram of *Asanadi GhanaVati*



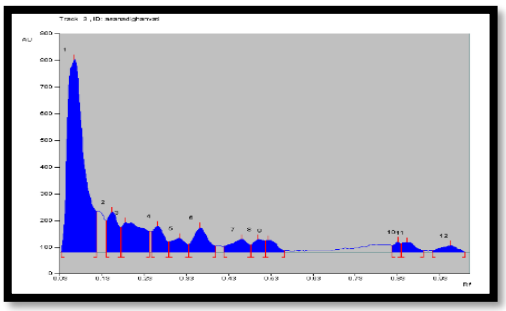


Table 1: Ingredients of *Asanadi Ghanavati* and *Churna*

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	1Part
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-2: Comparative Organoleptic characters

Name of Drug	Colour	Taste	Odour	Nature of powder (Touch)
Asanadi Churna	Muddy brown	Slightly aromatic	Astringent	Fine coarse
Asanadi Ghanavati	Brown	Aromatic	Astringent	Hard

Table-3: Comparative Physico-chemical properties

Sr. No.	Name of the Analysis	*Churna*	*Ghana Vati*
1	Loss on drying in percentage	0.48 %	6.91%
2	Ash value in percentage	4.82 %	19.98%
3	Water soluble extract in percentage	14.1 %	5.88%
4	Alcohol (Ethanol) soluble extract in percentage	1.8 %	5.7%
5	PH Value 5% aqueous	6.5	6.5

Table- 4: Comparative HPTLC

254nm		**366nm**	
No of spots	**R_f**	**No of spots**	**R_f**
Churna-11	0.00, 0.10, 0.20, 0.30, 0.40,0.50, 0.60, 0.70, 0.80, 0.90	11	0.00, 0.10, 0.20, 0.30, 0.40,0.50, 0.60, 0.70, 0.80, 0.90
GhanaVati-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 in exact authentication of ingredients present in formulation through its organoleptic characters like taste, odour, colour and touch along with microscopical characters and physico-chemical parameters. This can prevent the accidental misuse of drugs and adulteration to a greater extent. Presence of all contents of raw drugs in the final product shows the genuinely of the final product. *Churna* or *Vati* similar characters which are used in both of product showed the quality of the finished product. All the pharmaceutical parameters analysed showed values permissible for the *churna*. The Physicochemical Parameters show that percentage of water-soluble material is more than alcohol soluble extract. It also showed comparatively acidic nature of *Churna* which will be helpful to improve the *Jatharagni* (digestive fire). Thus, it can be inferred that the both drug forms 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 showed Tannin contain of *Khadir,* Rosette Crystal of *Arjun*, Rhomboidal crystal of *Agaru*, Scleriode of *Tinish,* Starch grain of *Kutaj*, Prismetic Crystal of *Shak*, Border pitted vessels of *Sweta Chandana,* Pitted Stone cell of *Shimshapa*, Crystal fibre of *Tinish*, Fibres of *Swethkhadir*, Lignified fibres of *Saal,* Lignified fibers of *Asana*, Oil globules of *Karanjbeej*, Prismatic crystal of *Dharuharidra*, Rhomboidal crystals of *Palash*, Trichome of *Meshashringi*, Epicarp cell of *Puga*, Fibres passing through medullary rays of *Asana* these all are the common characters of the ingredients present in formulation and all the previously described organoleptic characters, these all are the striking characters of all ingredients presents in finised product. (mentioned in above Table-1) and all previously described physico-chemical parameters of both showed within permissible limits.

REFERENCES:

1. World Health Organization, Global Report on Diabetes. Geneva, 2016 [https:// en.m.wikipedia.org,wiki.Epid…] Accessed 4 march 2018.
2. "Simple treatment to curb diabetes". January 20,2014. Archived from the original on 2014-02-02. [https: en.m.wikipedia.org,wiki.Epide….]
3. Anonymous, the *Ayurvedic* Pharmacopoeia of India, Part-I, Vol. 1-4, Govt. of India, Ministry of Health & Dept. of ISM and H. New Delhi; Dept. of Ayush; 1999; 155-56. 8.
4. Khandelwal K.R. Practical Pharmacognosy-techniques and experiments. 19th ed. India: Nirali *Prakashan*; 2008; 26-27.
5. Trease, G.E., Evans, W.C. Pharmacognosy, 12th Ed. Bailliere Tindall, Eastbourne. U.K. 1983; 95-99, 512-547.
6. Trease and Evans, Pharmacognosy, 15th Ed., W.B. Sunders Company Ltd. 1996; 569, 570.
7. Anonymous. The *Ayurvedic* Pharmacopeia of India. Part 2. Appendices. 1st ed., Vol. 2. New Delhi: Government of India Publication; 2008. p. 233-5.
8. Kalasz, H. and Bathory, M., Present status and future perspectives of thin-layer chromatography, LC-GC Int, 10: 440-445.