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Pharmacognostical and Pharmaceutical analysis of *Churna* For *Jambeera Pinda Swedana* - an *Ayurvedic* polyherbal formulation.

Scholar- Puja Nahak,

Guide- Prof. Dr. Anup B Thakar

Co-Guide- Dr. Rita Khagram

Department of Panchakarma, Department of Pharmacognosy Laboratory, Department of Pharmaceutics Laboratory

Institute of Teaching and Research in Ayurveda, Jamnagar, Gujarat

ABSTRACT:

Background: *Churna* for *Jambeera Pinda* is a polyherbal formulation mentioned in *Dharakalpa* containing various *Ayurvedic* medicinal drugs and specially indicated for the treatment of *Vatavyadhi*. For assurance of quality of herbal compounds pharmacognostical and pharmaceutical analysis should be done.

Methods: *Churna* for *Jambeera Pinda Swedana* was subjected to microscopic evaluation for pharmacognostical study, physicochemical analysis like hardness, weight variation, loss on drying, ash value, acid insoluble extract, PH value, water soluble extract, alcohol soluble extract, high performance thin layer chromatography (HPTLC).

Results: Pharmacognostical study showed the presence of certain identifying characters of all of the ingredients of *Churna* for *Jambeera Pinda Swedana* that is *Lasuna, Haridra, Methika, Satapushpa, Kulattha, Tila, Saindhava*. In pharmaceutical study, preliminary physiochemical analysis showed that ash value 15.67%, loss on drying 78.31%, water soluble extract 3.25 % w/w, alcohol soluble extract 1.44% w/w and HPTLC showed 10 spots at 254 nm and 5 spots at 366 nm.

Conclusion: Present work was carried out to standardize the polyherbal formulation *Churna* for *Jambeera Pinda Swedana* in terms of its identity, quality and purity. Pharmacognostical and physioco-chemical observations revealed the specific characters of active constituents in the preparation were present in it.

Keywords: Jambeera Pinda Swedana, Pharmacognosy, Pharmaceutics

INTRODUCTION:

Churna for *Jambeera Pinda Swedana*[i], a polyherbal formulation contains various herbal drugs (Table 1) that is *Lasuna, Methika, Satapushpa, Kulattha, Tila, Haridra, Saindhava*. *Churna* for *Jambeera Pinda Swedana* is mainly indicated in *Vatavyadhi* in *Dharakalpa*. Thus, *Churna* for *Jambeera Pinda Swedana* mainly pacify *Kapha* and *Vata Dosha*. While applying externally, it should be safe, effective and free from adulteration, with appropriate quantity and ingredients. It is difficult to identify herbal drug in dry or powdered form. This condition leads to increase in adulteration. So, it is a need of time to set proper parameters for standardization of herbal drugs. Pharmacognostical studies reveals plant identification and sets parameters for standardization which can be done in the case of herbal traditional medicine. Generally, physicochemical analytical study of drugs helps to interpret the pharmaco kinetics and pharmacodynamics involved. With the help of physico-chemical analytical studies, it is possible to standardize the drug and differentiate the adulterants.

High performance liquid chromatography (HPTLC) is the conventional method used in the analysis of secondary metabolites originating from plants. It is 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 help in the globalization of *Ayurveda*.

Objectives of this studies are to evaluate the authenticity of *Churna* for *Jambeera Pinda Swedana* through various pharmacognostical procedures and to develop the pharmacognostical and phyto-chemical profile of *Churna* for *Jambeera Pinda Swedana*.

METHODS:

Collection, identification and authentication of raw drugs

The raw materials were collected from the market of Jamnagar. All the raw drugs were identified and authenticated in the pharmacognosy laboratory of Institute of Teaching and Research in Ayurveda, Jamnagar, Gujarat, India.

Preparation of drug

All drugs were purchased from the market of Jamnagar. Then a mixture was prepared by using coarse powder of different drugs.

Pharmacognostical study[ii]

Individual raw drugs identified and verified with API. Finished drugs were identified and authenticated by the Pharmacognosy lab, ITRA, Jamnagar. The identification was carried out based on organoleptic features and microscopy of the prepared drug.

Organoleptic study

The genuinity of the polyherbal formulation can be fined with organoleptic characters of the given sample. Organoleptic parameters comprise taste, colour, odour and touch of *Churna* for *Jambeera Pinda Swedana* which was scientifically studied as per the standard references.

Microscopic study

The powder was dissolved with water and microscopy of the sample was done without stain and after staining with Phloro-glucinol + HCl. Microphotographs of Jambeera Pinda Churna were also taken under Corl-zeisstrinocular microscope.

Physico-chemical analysis

With the help of various standard physico-chemical parameters, Jambeera Pinda Churna was analyzed. The common parameters mentioned for Churna Kalpana in Ayurvedic Pharmacopia of India and CCRAS, guidelines are loss on drying, hardness, total ash value, water soluble extract, alcohol soluble extract and PH value.

High performance thin layer chromatography

High performance thin layer chromatography (HPTLC) is a powerful analytical method suitable for the separation and quantitative determination of a considerable number of compounds even from complicated matrix. HPTLC is used for identification of active constituents. Principle of HPTLC remains the same as of TLC i.e., adsorption. One or more compounds can be spotted in a thin layer of adsorbent coated on a chromatographic figure. The mobile phase solvent flows through because of capillary action against gravitational force. The component with more affinity towards stationary phase travels faster. Thus, the components are separated on a thin layer chromatographic figure based on the affinity of the components towards the stationary phase.

Steps involved in HPTLC were as follows:

- Sample and standard preparation
- Selection of chromatographic layer
- Layer pre-washing
- Layer pre-conditioning
- Application of sample
- Chromatographic development
- Detection of spots
- Scanning and documentation

Methanol extract of *Churna* for *Jambeera Pinda Swedana* were spotted on pre-coated silica gel GF CO254 aluminium figure as 5 mm bands, 5 mm apart and 1 cm from the edge of the figures, by means of camage, linomate V sample applicator fitted with a 100 µL. Hamilton syringe was used as the mobile phase. After development, densitometry scanning was performed with a camage TLC scanner 3 reflectance absorbance mode at 254 nm 366 nm under control of win cats' software. The slit dimensions were 6.00 × 0.45 mm and the scanning speed was 20 mm per second.

RESULTS

The organoleptic characters, physico-chemical parameters and HPTLC profie were given in Table no. 2, Table no.3 and Table no.4 respectively.

Table no.1:

No.	Drug	Botanical name	Part used	Quantity (Approx.)
1.	*Methika*	*Trigonella fenugraecum Linn.*	Seed	6 gm
2.	*Shathava*	*Antheum sowa Kurz.*	Seed	6 gm
3.	*Tila*	*Sesamum indicum DC.*	Seed	6 gm
4.	*Kulatha*	*Dolichus biflorus Linn.*	Seed	6 gm
5.	*Lasuna*	*Allium sativum*	Bulb	2-3 pods
6.	*Haridra*	*Curcuma longa Linn.*	Tuber	15 gm

Table no. 2: Organoleptic characters of *Churna* for *Jambeera Pinda*

Parameter	*Churna* for *Jambeera Pinda*
Colour	Brown
Odour	Pungent
Taste	*Katu Kashaya*
Touch	Coarse

Table no.3: Physico-Chemical Parameters for *Churna* for *Jambeera Pinda*

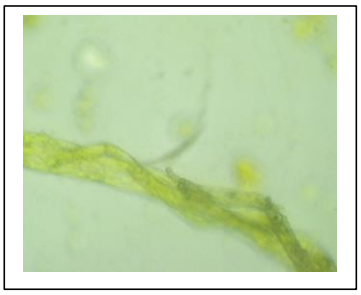
No.	Parameters/ Sample	*Churna* for *Jambeera Pinda*
1.	Loss on drying	8.20% w/w
2.	Ash value	5.80% w/w
3.	Water soluble extractive	99.77% w/w
4.	Methanol soluble extractive	4.25% w/w
5.	pH value	6

Table no.4: HPTLC profile/ Rf values of *Churna* for *Jambeera Pinda*:

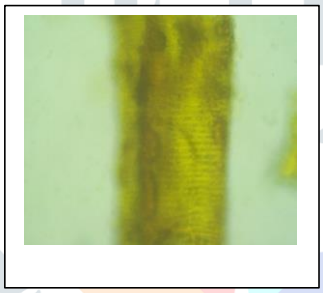
Extract	Solvent system	Wavelength	No. Of Spots	Maximum Rf Value
Methanolextract	Toluene:Ethylacetate: Acetic acid (14:4:2)	At 254 nm	10 spots	0.04, 0.03, 0.25, 0.29, 0.52, 0.66, 0.71, 0.75, 0.79
		At 366 nm	5 spots	0.02, 0.07, 0.35, 0.38, 0.6.

Microscopic study of *Churna* for *Jambeera Pinda Swedana*:

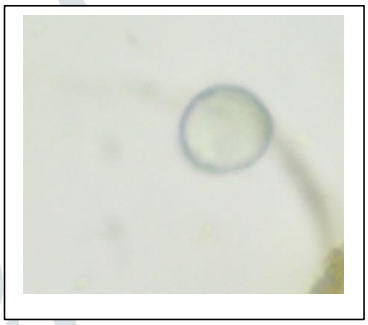
Identifying characters of ingredients of *Churna* for *Jambeera Pinda Swedana* under the microscope were as follow:



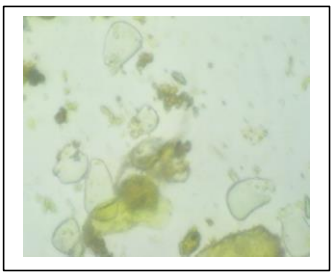
Simple Fibers of ***Haridra***



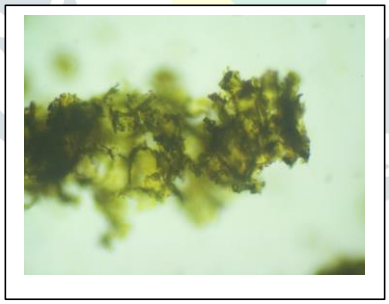
Scalariform Vessels



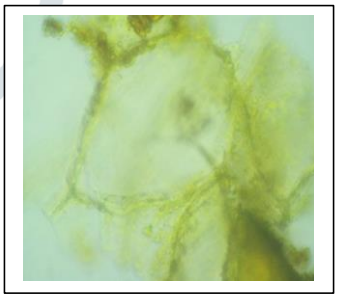
Oil globules



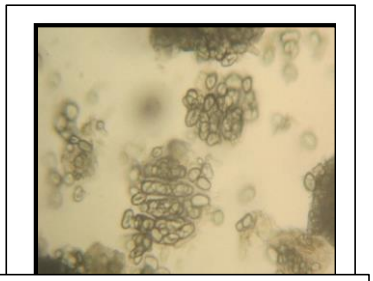
Simple starch grains



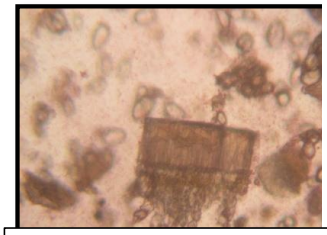
Cork in Surface



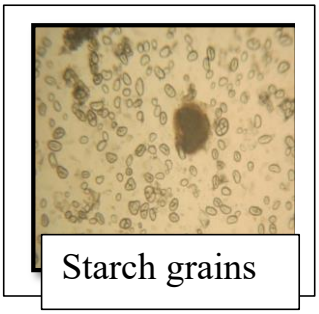
Parenchyma cells



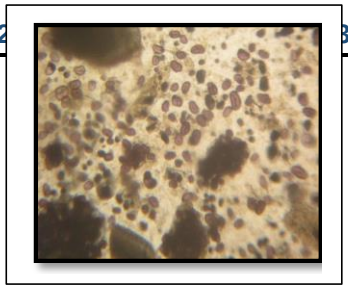
Parenchyma cells with starch grains ***Kulatha***



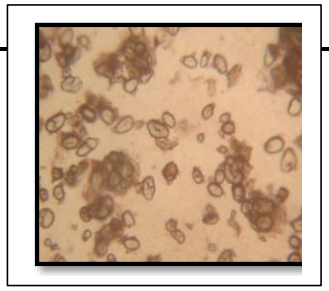
Fragment of palisade parenchyma cells



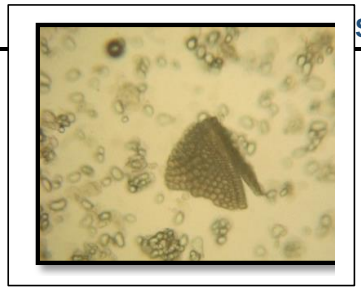
Starch grains



Starch Iodine



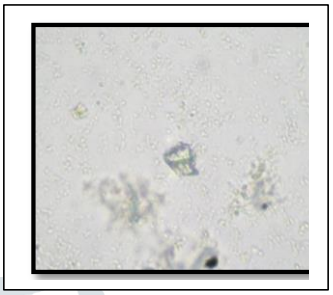
Oil globules along with starch grains



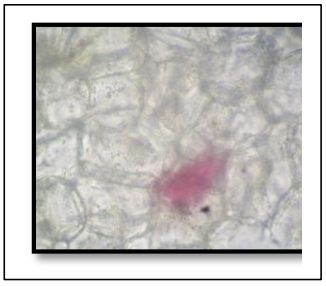
Parenchyma cells of cotyledons

Trichome of ***Lasuna***

Lignified scleroid

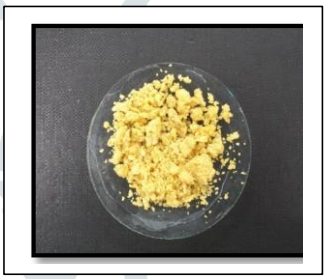


Crystalline material



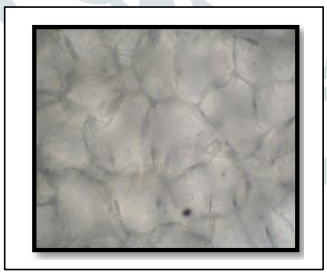
Parenchyma cells with coloring matter

Simple fiber



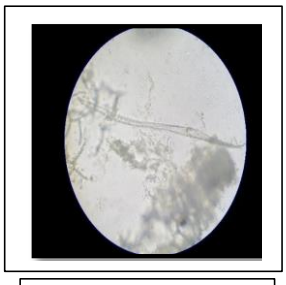
Sathahva

Lignified scleroid

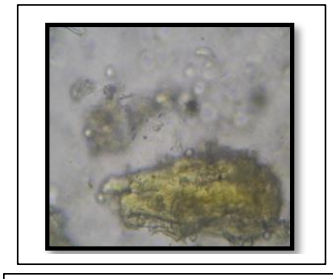


Parenchyma cells

Vessels



Simple fiber



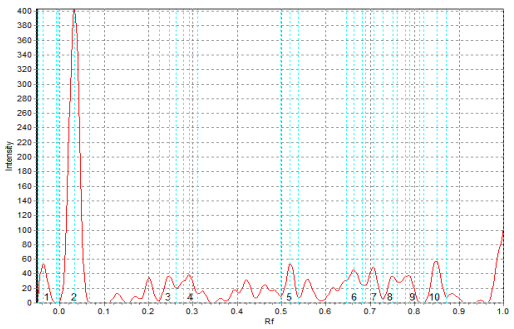
Crystalline material

Physico-chemical analysis of *Churna* for *Jambeera Pinda Swedana*:[iii]

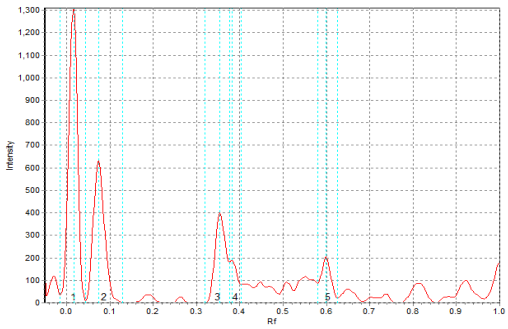
Physico-chemical analysis of *Churna* for *Jambeera Pinda Swedana* revealed the ash value was 15.67%, loss on drying 78.31%, water soluble extract 3.25% w/w, alcohol soluble extract 1.44% w/w and PH value was 6.

High performance thin layer chromatography of *Churna* for *Jambeera Pinda Swedana*:[iv]

On performing HPTLC, the chromatogram of *Churna* for *Jambeera Pinda Swedana* showed 10 spots at 254 nm at -0.04, 0.03, 0.25, 0.29, 0.52, 0.66, 0.71, 0.75, 0.79 and 0.85 and 5 spots at 366 nm at 0.02, 0.07, 0.35, 0.38, 0.6.



254 nm



366 nm

DISCUSSION

Pharmacognostical part of the study of *Churna* for *Jambeera Pinda Swedana* was the step towards identification of all raw material present in the product. The presence of all contents of raw drugs in the product showed the genuinity of the product. Hence *Churna* for *Jambeera Pinda Swedana* is herbomineral drug, identification of mineral parts *Churna* for *Jambeera Pinda Swedana* of cannot be evaluated through pharmacognosy. All the pharmaceutical parameters were done to analyze the values permissible for the *Churna* for *Jambeera Pinda Swedana*. All the parameters tested under the pharmaceutical study are as per the API. The physicochemical parameters showed that percentage of water-soluble extract was more than alcohol soluble extract which indicates the presence of flavonoids, tannins and anthocyanidins in the drug. While alcohol soluble extract value denotes the presence of tannins, resins and alkaloids in the drug. Ash value of product is 15.67% shows the presence of inorganic material which cannot be identified through pharmacognosy.

CONCLUSION

The Pharmacognostical and physico-chemical analysis of *Churna* for *Jambeera Pinda Swedana* confirmed the purity and genuinity of the drug. Published information is not available on pharmacognostical and physico-chemical profiles of *Churna* for *Jambeera Pinda Swedana*. Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

[i] *Jayaram P, Sankaranarayana* M; *Keraliya Cikitsa Paddhatih, Dharakalpa* English – Commentary; pp,203

[ii] Anonymous, the Ayurvedic Pharmacopia of India, Part-1, Vol. 1-4, Govt. of India, Ministry of Health and FW, Dept. of ISM and H. New Delhi; Dept. of Ayush, 1999; 155-56
[iii] Baxi A.J., Shukla V.J. and Bhatt U.B., Methods of Qualitative Testing of Some Ayurvedic formulation, Gujarat Ayurveda University, Jamnagar, June 2001: 05-12
[iv] Anonymous, Planner Chromatography, Modern Thin layer Chromatography, Switzerland,1999;2-1