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Pharmacognostical and pharmaceutical study of *Paushtika* Biscuit - An ayurveda nutritive compound

Pravin Masram, Harisha CR, Patel KS, Kori VK, Rajagopala S and Shukla VJ

Abstract
Nutritional diseases are by far the most common throughout the world, among them protein energy malnutrition is the commonest one. It is the most widespread health and nutritional problem in developing countries. A silent and largely invisible emergency, malnutrition plays a role in more than half of the nearly 11 million deaths each year among children under age five. Children in weaning period and those who have not fed properly with an appropriate food are more prone to malnutrition. So for the treatment of malnutrition, an Ayurvedic formulation of *Paushtika* Biscuit was selected, it is a food of choice in weaning period. The present work was carried out to standardize the finished product *Paushtika* Biscuit to conform its identity, quality and purity. The pharmacognostical work reveals that presence of pitted vessels of *Guduchi,* starch grains of *Shunti*, miso carp cell of *Kharjur*, Epidermal cell of wheat, Fibres of *Atibala,* Dark yellow sugar contains of *Kharjur* etc. was observed microscopically. Organoleptic features of coarse powder made out of the crude drugs were within the standard range as mentioned in the classic. The pH value of GB was 4, Water soluble extract was 1.89%w/w, Loss on drying was 5.48%w/w and High Performance Thin Layer Chromatography (HPTLC) at 254nm and 366nm resulted into 7 & 4 spots respectively.

Keywords: HPTLC, Malnutrition *Paushtika* Biscuit, Pharmacognosy, Pharmaceutics

1. Introduction
The nutritional requirement of the human body reflects the nutritional intake necessary to maintain optimal body function and to meet the body's daily energy needs. The health and well-being of any individual is based on a combination of various factor. Diet and good nutrition, a host of contributory factors go a long way in preventing disease and malnutrition. According to WHO definition Malnutrion involves a cellular imbalance between supply of nutrients and energy and body's demand for them to ensure normal growth, maintenance and specific tissue function [1]. Malnutrition affects growth and development and also the school performance of the children [2].
According to Ayurveda, *Krisha* is lean and thin looking person. These *Krisha* person has less fat at these places termed as *Krisha* but when this condition persist for a longer period turn in to *Atikrisha*. *Rasadhatu* which has the prime function of nourishment and providing support to the vital functions gives rise to the symptoms like dried up buttocks, abdomen and neck region, prominent vascular network, prominent bones and joints. In *Krisha* person development of proper dhatu was hampered. *Rasadhatu* is not prepared in good quantity and quality which lead to depletion of *Rakta*, *Mamsa* and *Medodhatu*.
There is various treatment protocol mentioned in Ayurveda classics for the management of *Karshya*. *Paushtika* Biscuit is herbo-mineral compound which is used in *Karshya*. Main ingredient of *Paushtika* biscuit is *Godhuma* (Wheat) which included among the *Nityopayogi Ahara Dravya* i.e. the dietary item which can be used in daily diet, having *Brumhana* (bulk promoting) properties [3]. *Paushtika* Biscuit compound which is very safe and may be effectively used in malnutrition. So the present work was carried out to standardize and evaluate the pharmacognostical as well as to analyze the physico-chemical properties of *Paushtika* Biscuit.

Materials and methods
Drug Material
Raw drug materials were collected from the pharmacy store of Gujarat Ayurved University. The ingredients and the part used are given in table 1.

Pharmacognostical evaluation

Raw drugs were identified and authenticated by the Pharmacognosy lab, I.P.G.T&R.A., Jamnagar. The identification was carried out based on the morphological features, organoleptic features and powder microscopy of the individual drugs. Later, Pharmacognostical evaluation of the *Paushtika* Biscuit was carried out. *Paushtika* Biscuit dissolved in small quantity of distilled water, filtered through filter paper, filtrate studied under the Corl zeiss Trinocular microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope [4, 5]

Method of Preparation of the *Paushtika* Biscuit

Godhum Churna, *Amalaki*, *Makhana*, *Madhuyashti, Guduchi, Atibala,* Dry *Kharjura Pravala Mandura*, and sugar were taken in given proportion. All these contents were mixed with powdered *Sharkara*. Ghee was added in this mixture and homogeneous mixture of these entire was made in machine. This mixture was spread on clean surface and equal size biscuit were made of this mixture. Then these biscuits were arranged in tray in single layer. Then these trays were kept in a furnace for 20 min at a temperature of 150 ^{0}c. After confirming that proper baking is done biscuit trays was taken out. Efforts were taken to make every biscuit of approximately 10 grams.

Physicochemical evaluation

Paushtika Biscuit was analyzed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent system with, methanolic extract of *Paushtika* Biscuit at the Pharmaceutical Chemistry lab, I.P.G.T. & R.A. Gujarat Ayurved University, Jamnagar [6, 7]. Presence of more moisture content in a sample may create preservation problem. Hence loss on drying was also selected as one of the parameters [8].

Results and discussion

Organoleptic study

Organoleptic features of *Paushtika* Biscuit were observed like brown light color, fragment in odour, light sweet in taste and thick solid touch [Table-2].

Microscopic study

The diagnostic characters of *Paushtika* Biscuit compound formulation shows pitted vessels of *Guduchi*, starch grains of *Shunti*, meso carp cell of *Kharjur*, Epidermal cell of wheat, Fibres of *Atibala*, Dark yellow sugar contains of *Kharjur*, starch grains of wheat, Crystal fibres *Yastimadhu*, Trichome of *Atibala*, fibres of *shunti*, Prismatic crystals of *Atibala*, Pitted vessels of *Yastimadhu*, Cork cell of *Gudhuchi*, Epidermal cell of *Mandukparni*, Simple fibres of *Mandukparni* [figure-1].

Physico- chemical Parameters:

Physico- chemical Parameters of the *Paushtika* Biscuit like uniformity, loss on drying were all found to be within the normal range. The water soluble extract and methanol soluble extract values were found to be 1.89%% w/w and 17.5% w/w respectively [table-3].

HPTLC study results

On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer much more was observed and at 254nm the chromatogram showed 7 peaks, at 366nm the chromatogram showed 6 peaks (Table-4).

Conclusion

Pharmacognosy and phytochemical evaluation of *Paushtika* Biscuit was performed which is a potent medicine in the management of *Karshya.* Preliminary Organoleptic features and results of powder microscopy shows the ingredients which were used confirm the genuinity and quality of *Paushtika* Biscuit. All the ingredients were proved to be authentic and compared with the parameters mentioned in API (Ayurvedic Pharmacopeia of India). In phytochemical analysis, water soluble & alcohol soluble extract, pH, Ash value was assessed.

Though the groundwork requisites for the standardization of *Paushtika* Biscuit are covered in the current study, additional important analysis investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

Table 1: Ingredients of *Paushtika* Biscuit

Sr. No.	Name	Latin Name	Part to be used	Proportion
1	*Godhum*	*Tritucum turgidum var mirabile*	Seed	50%
2	*Makhana*	*Euryale ferox* salisb	Fruit	10%
3	*Amalaki*	*Emblica officinalis* Gaertn.	Dried Fruit	1 Part
4	*Madhuyashti*	*Glycyrrhiza glabra* Linn.	Root	1 Part
5	*Mandukaparni*	*Centella asiatica* Linn.	*Panchanga*	1 Part
6	*Guduchi*	*Tinospora cordifoila* Willd.	Stem	1 Part
7	*Atibala*	*Abutilon indicum* Linn.	Root & seeds	1 Part
8	Dry*Kharjoora*	*Phoenix dactylifera* Linn.	Dried Fruit	1/3rdof Total
9	*Shunthi*	*Zingiber officinale* Roxb.	Rhizome	1/10th Part
10	*Pravala*	Coral	Bhasma	1/10th Part
11	*Mandura*	Red iron oxide	Bhasma	1/10th Part
12	*Sharkara*	-	-	- QS -

Table 2: Organoleptic Features of Wheat flour Biscuit Characters Observed- Morphology/ Appearance

No	Parameters	Observation
1.	Shape	Rectangular
2.	Size/ Diameter	3.6 cm

Organoleptic characters of *Paushtika* Biscuit

No.	Parameters	Observation
1	Color	Brown light
2	Odor	fragment
3	Taste	light Sweet
4	Touch	Thick solid

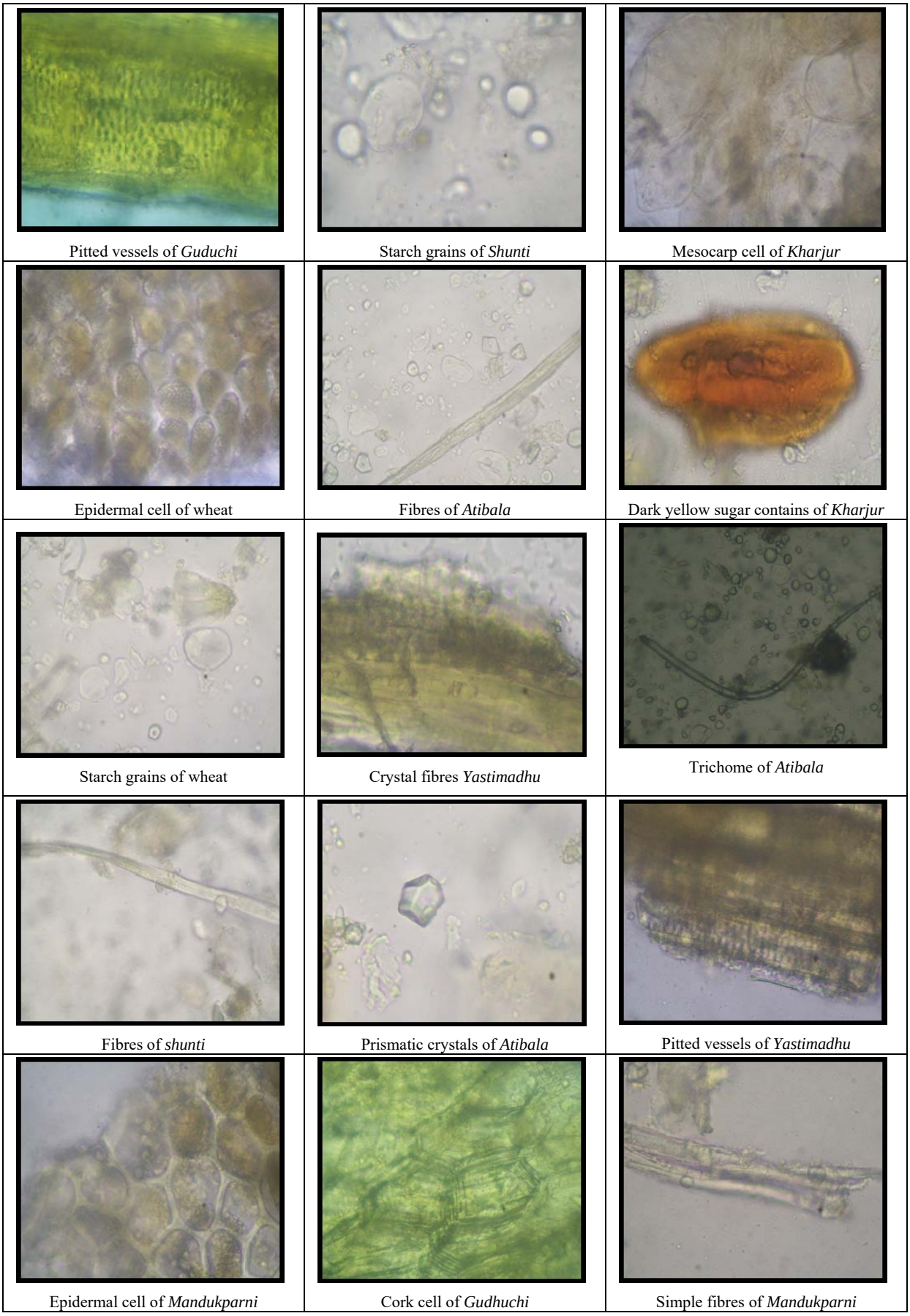


Fig 1: Microphotographs of *Paushtika* Biscuit

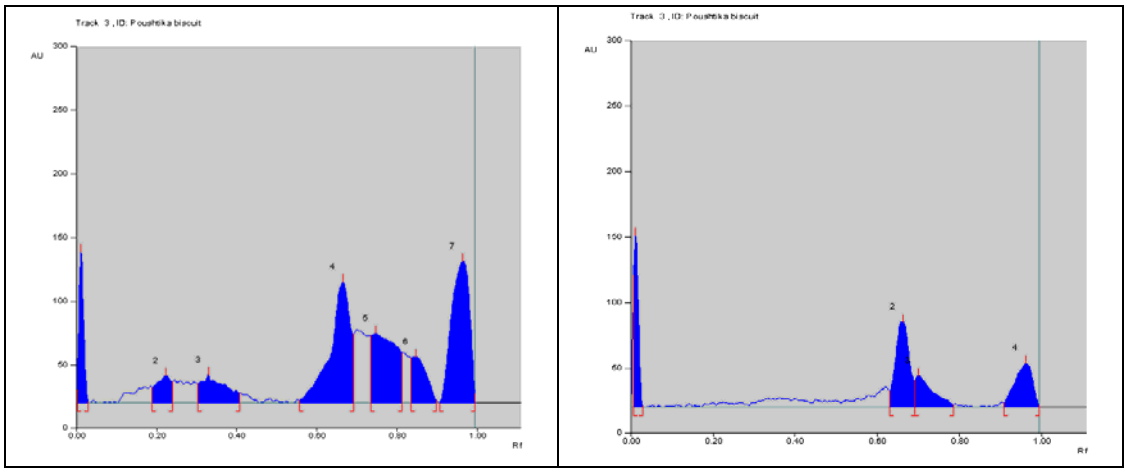
Table 3: Physio- Chemical Parameters of *Paushtika* Biscuit

Sr. No.	Test	Result
		***Paushtika* Biscuit**
1	Uniformity of Biscuit	10 g
	Average weight	11.40 g
	Highest weight	13.00 g
	Lowest weight	9.30 g
2	Water soluble extract	1.89% w/w
3	Methanol soluble extract	17.5% w/w
4	pH of 5% aqueous solution	4
5	Ash value	6.57%
6	Loss on drying at 110 C	5.48% w/w

Table 4: Showing Results of HPTLC of *Paushtika* Biscuit

Extract	Solvent system	Wavelengths	Spots	Max. Rf value
Methanol	Toluene: Ethyl acetate: Acetic Acid (7:2:1) V/V	254 nm	7	0.01, 0.22, 0.33, 0.67, 0.75, 0.85,0.96
		366 nm	4	0.01, 0.66, 0.70,0.96

Photograph of HPTLC of *Paushtika* Biscuit



At 254nm At 366nm

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