



## Short Communication

Pharmacognostical evaluation of *Psoralea corylifolia* Linn. seed

Sahara Shrestha <sup>a,\*</sup>, Hasmukh R. Jadav <sup>a</sup>, Prashant Bedarkar <sup>a</sup>, B.J. Patgiri <sup>a</sup>, C.R. Harisha <sup>b</sup>,  
Swarnil Y. Chaudhari <sup>c</sup>, Pradeep K. Prajapati <sup>d</sup>

<sup>a</sup> Department of Rasashastra & Bhaishajya Kalpana, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar 361008, India

<sup>b</sup> Pharmacognosy Laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar 361008, India

<sup>c</sup> Central Ayurveda Research Institute Drug Development, Kolkata, India

<sup>d</sup> Department of Rasashastra & Bhaishajya Kalpana, AIIA, New Delhi, India

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## ABSTRACT

*Psoralea corylifolia* Linn. belonging to *Fabaceae* family is an important endangered plant that has been therapeutically used to treat different pathological manifestations since ages. It is commonly known as *Bakuchi* in Sanskrit. Though it is an important plant, till date, no pharmacognostical reports have been available on its seed. A lot of adulterations are also present in the market. The present study is aimed towards evaluating pharmacognostical and histochemical characteristics of the seeds of *P. corylifolia* Linn. in detail. Macroscopic and microscopic pharmacognostical characters of seeds and histochemical studies were noted by following standard methods. Pharmacognostical evaluation of seed shows the presence of volatile oil, silica deposits and stone cells. The observations found in current work can be considered as reference standards in future studies.

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## 1. Introduction

Various plant species are mostly used in Ayurveda, and their good therapeutic effect is directly proportional to genuine raw material. They are obtained from geographical or commercial sources. Hence, correct identification of raw material becomes mandatory [1]. *Psoralea corylifolia* Linn (Fabaceae), a medicinally important plant, indigenous to tropical and subtropical regions of the world, is reported in the Indian Pharmaceutical Codex, the Chinese, British and American Pharmacopoeias and in different traditional systems of medicine, such as, Ayurveda, Unani and Siddha [2]. *P. corylifolia* Linn. commonly known as '*Bakuchi*' is conventionally used in *Ayurvedic* system of medicine for the treatment of various pathological conditions but especially for treatment of skin disorders such as psoriasis, leucoderma and leprosy in the form of internal medications [3] as well as external applications [4]. *P. corylifolia* Linn. seed has been reported to

contain several phytoconstituents including coumarins and flavone components, such as psoralen, isopsoralen, psoralidin, neobavaisoflavone, bavachin, corylin, bavachalcone [5] and possess antibacterial, antiinflammatory [6], antifungal [7], anti-oxidant [8,9], antifilarial [10], estrogenic [11], antitumor [12], and immune-modulatory activity [13]. Like many other important botanical treasures, *Bakuchi* these days is also getting adulterated raising a question to its genuinity. Thus, it is important to know the identification points on which it can be authenticated. Review of literature reveals that *Bakuchi* seed has not been studied in detail for its pharmacognostical characters. Considering this, an attempt has been made to establish preliminary pharmacognostical profile of seed which may be considered as a reference standard for future studies. This helps in further research on seeds and other parts of the same plant and also other plant species. Hence, the present work was undertaken to establish certain identification standards of *P. corylifolia* Linn.

\* Corresponding author.

E-mail: [saharestha@yahoo.com](mailto:saharestha@yahoo.com)

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## 2. Materials and methods

The fruits of *P. corylifolia* Linn were collected from Pharmacy, Gujarat Ayurved University, Jamnagar. Botanical identification was done with the help of various floras, and it was authenticated at the Pharmacognosy lab, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar. Organoleptic characters like color, taste, touch and odor were recorded. Thin free hand sections were studied with and without staining (phloroglucinol and concentrated HCl). Powder microscopy of powder #60 was carried out [14]. Photomicrographs were taken using Carl Zeiss trinocular microscope attached to camera. Histochemical studies were carried out by taking free hand sections of seed treated with various reagents, and we found tannin, mucilage, etc. [15]. Physico-chemical profiling was carried out from powder [16].

## 3. Results and discussion

### 3.1. Morphology

*P. corylifolia* Linn is an erect annual herbaceous plant. Its length varies from 0.6 m to 1.2 m in height. The stem is grooved. The leaves are simple,  $3.8 \times 2.5$ –5.0 cm long, broadly elliptical and hairy. The petioles are hairy and gland dotted. Flowers are blue in the dense axillary, solitary, 10–30 flowered racemes. The fruit pods are 5 mm long, ovoid-oblong, mucronate and black. The seeds are oblong flattened, dark brown with an agreeable aromatic odor (Plate 1A).

### 3.2. T. S. of fruit

Raw drug consists of individual fruits along with persistent calyx. Seeds measure about  $0.7 \times 0.5$  cm. The seeds are kidney shaped, pointed at the posterior end (Plate 1B). The

**Table 1**

Organoleptic characters of *P. corylifolia* Linn seed.

Sr. no.	Organoleptic characters	Observation
1	Color	Dark brownish black
2	Odor	Oily
3	Taste	Characteristic
4	Touch	Rough

organoleptic characters were recorded (Table 1). The outer testa consists of seven differentiating layers (Plate 1C) followed by endocarp made up of outer single layer of barrel-shaped cells (Plate 1D).

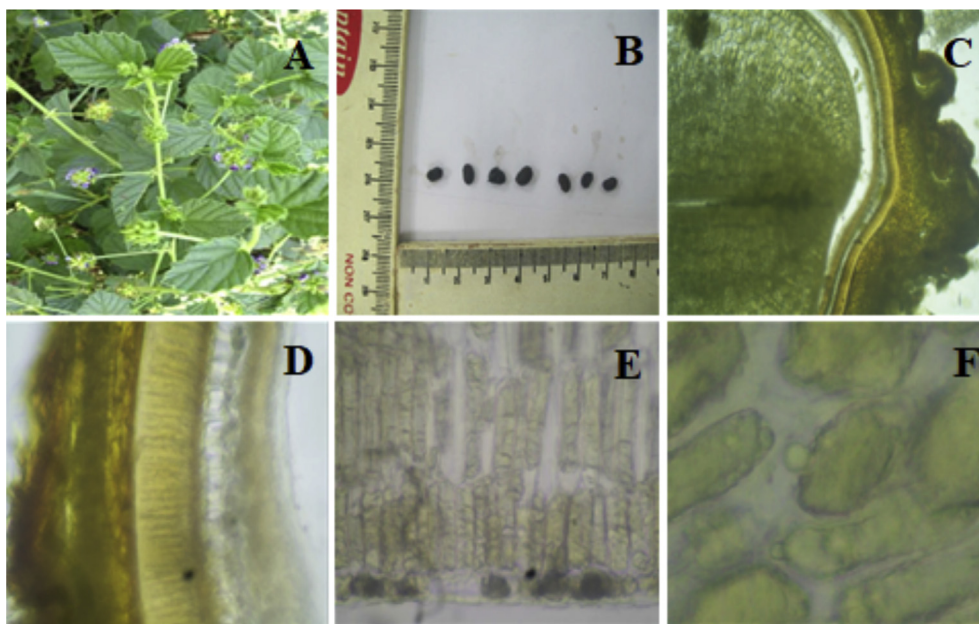
These cells are followed by endosperm cells (Plate 1E).

Endosperm cells are rich in oil globules (Plate 2A). The outer seed coat consists of thickly compact arranged cells followed by lysigenous cavities and parenchyma cells (Plate 2F). Parenchyma cells are followed by yellowish-orange spool cells. The longitudinally elongated compactly arranged cells lead into short indiscriminated C-shaped cell layer which in turn leads into the inner testa. The inner endosperm layer consists of crystalline material (Plate 1F).

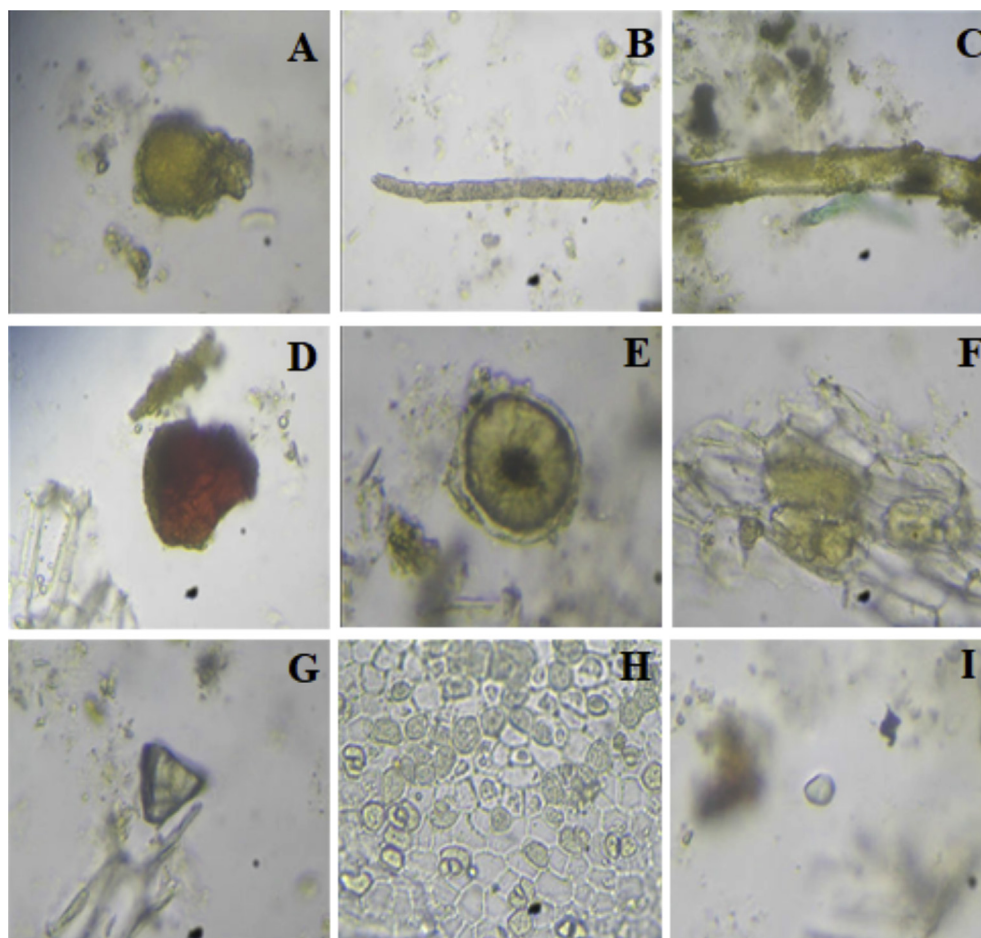
## 4. Powder microscopy

### 4.1. Organoleptic characters

Organoleptic characters, i.e. color, odor and taste were recorded (Table 2). Diagnostic characters of powder shows simple unicellular trichome (Plate 1B), epicarp & mesocarp cells in tangential view, green content, volatile oil, pollen grain, silica deposition, simple fibers (Plate 1C), brown content, prismatic crystals (Plate 2G) and stone cells (Plate 2E). After staining, stomata present in the cells were vividly visible.



**Plate 1.** Transverse section of *Bakuchi*. A) Natural plant; B) Micro-measurement of seed; C) Testa with seven differentiating layers D) Endocarp with outer single layer of barrel-shaped cells; E) Endosperm cells; F) Inner endosperm with crystalline material.



**Plate 2.** Powder microphotographs of *Bakuchi*. A) Oil globules; B) Trichome; C) Simple fibre; D) Tannin content; E) Stone cell; F) Parenchyma cells; G) Prismatic crystal; H) Endosperm cells with oil; I) Starch grains.

**Table 2**

Organoleptic characters of *P. corylifolia* Linn seed powder.

Sr. no.	Organoleptic characters	Observation
1	Color	Blackish brown
2	Odor	Characteristic aromatic
3	Taste	Bitter
4	Touch	Oily

## 5. Histochemical evaluation

Thick sections were subjected to various chemical tests, and tannin (Plate 2D), lignin etc., were detected (Table 3).

**Table 3**

Histochemical evaluation of thick sections.

Sr. no.	Reagent	Observation	Characteristic feature	Result
1	Phloroglucinol + concentrated HCl	Red	Lignified cells	++
2	Phloroglucinol + concentrated HCl	Dissolved	Crystals	++
3	FeCl <sub>3</sub> solution	Dark blue	Tannin	++
4	Sudan III	Red	Oil	++

## 6. Conclusion

Pharmacognostical study of *P. corylifolia* Linn provides specific parameters that will be useful for identification and authentication of the drug. Parenchyma cells, barrel-shaped endocarp, oil globules of endosperm, lysigenous cavities in outer seed coat, yellowish-orange spool shaped cells, crystalline material in endosperm are the prominent characters that distinguish it from other plant species. As no published reports are available on this plant, the results obtained in the current study may be referred to as a standard in future studies.

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## Conflict of interest

None.

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