

Macroscopic and microscopic evaluation of *Psoralea corylifolia* Linn seeds in and around Bhopal

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ABSTRACT

Psoralea corylifolia Linn. (Leguminosae), commonly known as Bakuchi, is an herbaceous, well-known traditional medicinal plant used since ancient times. In order to record the characteristics of diagnostic value, the current study was planned to investigate the seed's macroscopic and microscopic examination. Macroscopic studies are comprised of shape, size, taste, color, odor, etc. The anatomy of the seeds was studied by transverse section. This was evaluated and photographed by the 10X, 20X, and 40X lenses of a photographic microscope, Model No. DM3000. This information will be used for further therapeutic and pharmacological evaluation and will help to identify the sample's quality and purity. Additionally, the study would be a useful tool for identifying drugs and verifying high-quality formulations.

Keywords: Bakuchi seeds, macroscopic, microscopic, quality, purity.

INTRODUCTION

Psoralea corylifolia Linn.(Leguminosae), commonly known as Bakuchi, is an herbaceous, well-known traditional medicinal plant used since ancient times. It is widely distributed and used as an important part of therapeutics in Chinese and Ayurvedic medicine. (Alam *et al*, 2017). Medicinal plants have rich sources of phytochemicals such as sterols, flavonoids, saponins, alkaloids, tannins, volatile oils, etc. that are used for therapeutic and aromatic purposes and are produced naturally. Macroscopic study is a technique of qualitative assessment that is based on the study of the morphological and sensory profiles of the plant. This technique is helpful to examine and distinguish the desired plant species, or plant parts, and morphologically similar yet distinguishable species that could occur as adulterants. On the other hand, microscopic examination helps to analyze the distinct characteristics of a particular plant sample and thus helps in the identification of the organized drugs by their known histological characters and in confirming the structural details of the herbal drug. **The** quality control parameters of the seeds of *Psoralea corylifolia* Linn. Studies were established with the help of macroscopic and microscopic studies. As per the World Health Organization (WHO), it is highly recommended to do a macroscopic and microscopic examination of a medicinal plant as the first step of identity and purity before going for other further level - experiments.

Table 1-Geographic location of sampling sites:

| S. No. | Sampling site | Latitude(N) | Longitude(E) |
|--------|----------------|--------------|--------------|
| 1. | Vidisha (M.P.) | 23.672692 °N | 78.122234 °E |
| 2. | Bhopal (M.P.) | 23.1664 °N | 77.3724 °E |
| 3. | Raisen (M.P.) | 22.9050 °N | 77.5225 °E |

MATERIAL AND METHODS

Collection and authentication of Plant material: Plant materials were collected from 3 different sampling areas, i.e., Vidisha (VPS), Raisen (RPS), and Bhopal (BPS), of Madhya Pradesh, and processed for further study. The seeds are then used for macroscopic and microscopic purposes.

Organoleptic and macroscopic study: The Bakuchi seeds were subjected to macroscopic studies, which comprised the color, size, odor, shape, taste, surface, and fracture of the seeds.

Microscopic study: The microscopic evaluation was carried out by dried seeds being boiled with chloral hydrate to remove all the coloring matter and then carefully stained with phloroglucinol and HCl (1:1) and iodine, safranin etc. This was evaluated and photographed by the 10X, 20X, and 40X lenses of a photographic microscope, Model No. DM3000.

RESULTS

Authentication of plant samples: The collected plant samples were authenticated by Dr. Suman Mishra, Botanist, Vindhya Herbs Testing & Research Institute, Minor Forest Produce Processing & Research Centre (MFP-PARC), Bhopal, Madhya Pradesh, India.

Organoleptic and Macroscopic examination of seed: Organoleptic and macroscopic observations were illustrated in Table 2, which showed very little variation in Bakuchi seeds. There is hardly any difference among the three samples.

Following are the variations that were observed in sampling areas with respect to size (in mm), color, surface, odor, taste, and shapes of specimens collected from different regions around Bhopal, M.P. India. (Table 2)

Table T22: Macroscopic examination of seed specimens-

| Specimens Parameter | Bhopal (BPS) | Vidisha (VPS) | Raisen (RPS) |
|---------------------|--------------------|------------------------------|--------------------|
| Size (mm) | 3±0.5 | 2.5±0.5 | 4±0.5 |
| Length | 3.20±0.5 | 2.40±0.5 | 3.80±0.5 |
| Breadth | 2.45±0.5 | 2.35±0.5 | 2.41±0.5 |
| Colour | Dark Brown | Light Brown | Dark Brown |
| Surface(Texture) | Rough | Rough | Rough |
| Odour | Indistinct | Indistinct | Indistinct |
| Taste | Bitter | Slightly Bitter | Bitter |
| Shapes | Round kidney shape | Irregular Round kidney shape | Round kidney shape |

Size: The mean value of the BPS seed specimen was 3±0.5mm in size. The mean value of VPS seed specimens was 2.5±0.5mm, while the mean value of RPS specimens was reported as 4±0.5mm.

Length: Mean value of BPS seed specimen was 3.20±0.5mm in length. Mean value of VPS seed specimen was 2.40±0.5mm in length and mean value of RPS specimen was reported 3.80±0.5mm in length.

Breadth: The mean value of the BPS seed specimen was 2.45±0.5 mm in breadth. The mean value of the VPS seed specimen was 2.35 ± 0.5 mm in breadth. The mean value of the RPS specimen was reported 2.41±0.5 mm in breadth.

Color: There was a light brown to dark brown-colored seed surface reported in all collected seed specimens.

Surface-There was a rough seed surface reported in all collected seed specimens.

Odour-There was an indistinct odour reported in all collected seed specimens.

Taste-There was a bitter taste reported in BPS and RPS specimen and slightly bitter test reported in VPS collected seed specimens.

Shapes-There was irregular round shape reported in all collected seed specimens.

Microscopic Examination of seed:

Transverse section: The transverse section of the seed is almost oval in outline. A dark brown, highly convoluted margin containing a row of well-developed oleoresin canals in the outer mesocarp and small vascular strands in the inner one, a layer of endocarp and endosperm, a narrow seed coat, and huge central cotyledons in the major portion of the section are well long, with a road-like curved radical in the L.S. of the fruit. (PLATE 1)(fig.2)

CONCLUSION

The quality control parameters of the seeds of *Psoralea corylifolia* L. were established with the help of macro-morphological and microscopic studies. Prior to performing further investigations in accordance with WHO guidelines, the authenticity and purity of medicinal plant materials must first be established by determining their organoleptic, macroscopic, and microscopic features. (Biswas et al., 2015) Macroscopic and microscopic characteristics of the *Psoralea corylifolia* L. seeds will act as a useful source of information to establish their identity and determine the quality and purity of the plant material in future studies. This kind of study can offer supporting data even though it is unable to provide a comprehensive assessment profile of the herbal medication. This study is thus a substantial step, and when combined with other analytical parameters, it can be useful. Studied to obtain complete evidence for standardization and to ascertain them as drugs. The macroscopic and microscopic methods remain one of the easiest and most cost-effective ways to begin determining the correct identification of the parent materials. (Saurabh et al., 2010) Furthermore, for herbal standardization, the majority of regulatory procedures and pharmacopoeias recommend macroscopic and microscopic examination. (Patel et al., 2017)

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ABBREVIATIONS

M.P.: Madhya Pradesh; mm: millimeter; VPS: Vidisha; RPS: Raisen; BPS: Bhopal;
WHO: World Health Organization; HCl: Hydro Chloric Acid; cm-Centimeter;
L.S. - Longitudinal

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