



Research Article

PHYTO-PHARMACOGNOSTIC EVALUATION OF *STROBILANTHES BARBATUS NEES*

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ABSTRACT

Dravyaguna forms the backbone of rational therapeutics. Correct and skillful application of drugs is impossible without proper understanding of its identification and pharmacology. *Strobilanthes barbatus* Nees shows a wide distribution in Kerala. This drug is popular among the traditional healers and local people for its diverse clinical application. Till now no major research works have been done on its efficacy regarding the Ayurvedic perspectives. **Methodology:** Pharmacognostic analysis was conducted at the Department of Dravyaguna Vijnanam, Mannam Ayurveda Co-operative Medical College, Pandalam. Aerial part of *Strobilanthes barbatus* Nees was macroscopically and microscopically evaluated. The powder characteristics of the dried sample was also analysed. **Result and Discussion:** Bearded Coneflower is a gregarious shrub, 3-4 m tall, sometimes climbing. Macroscopic analysis: stem is rectangular in outline, with a lamina like wing structure projecting from four angles. Leaf is simple, petiolate, oppositely arranged in unequal pairs, elliptic-lance shaped. **Conclusion:** The current study drug shares similar morphological features to that of *S. ciliatus*. *Strobilanthes barbatus* could be easily propagated and cultivated. It is endemic to Western Ghats and widely distributed in Kerala.

INTRODUCTION

Plants kingdom is the primary source of medicine for people of every culture throughout the globe. According to WHO, 80% of the world population rely on traditional plant medicine^[1]. Ayurveda, the Indian system of medicine plays a major role among the different traditional systems throughout the world. Ayurveda the science of life has emerged through adaptation of man with natural touch of healthy living. Nowadays because of increased demand and less availability, genuine drugs are hardly available in market. It is necessary to use drugs which are available commonly, abundantly and highly efficacious.

Dravyaguna Vijnana, a branch of Ayurveda, is the science which deals with the *Guna* and *Karma* of a drug. *Dravyaguna*, can be interpreted as clinical pharmacology, forms the backbone of rational therapeutics by giving knowledge on fundamental and applied aspects in detail. Correct and skillful application of a drug is impossible without a proper understanding of Ayurvedic pharmacology. In current era practice of medicine is transforming from experience based to evidence based. Acknowledged by Acharya Charaka and Susrutha, the forest dwellers are the true source for identifying the medicinal plants with their therapeutic potentials. The information gathered from field observations, was subjected to clinical evaluation generating data on the therapeutic profiles of various herbs.

Present study drug *Strobilanthes barbatus* Nees is well explained in Flora of British India. Traditionally over decades the tribal community have used the plant in curing inflammatory disorders^[2]. The drug *Strobilanthes barbatus* Nees, along with other species of *Strobilanthes*, is used as a valid anti-inflammatory and anti-microbial herbal drug.

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MATERIALS AND METHODS

MATERIAL

Strobilanthes barbatus Nees is commonly distributed throughout Kerala and in Western Ghats. This plant is seen in and around the Pandalam, Pathanamthitta (Fig.1). For the purpose of the study, genuine sample was collected from Herbal Garden of Mannam Ayurveda Co-operative Medical College, Pandalam. The sample was authenticated from JNTBGRI, Palode.

METHODS

Macroscopic study, Microscopic study and powder microscopy was conducted.

Macroscopic Study

The stem and leaf of *Strobilanthes barbatus* Nees was subjected to organoleptic evaluation. A magnifying lens was used for better evaluation of surface characters.

The following characters of the genuine sample were noted;

- Dimensions: length, breadth and thickness
- Shape of pieces: whether curved, recurved, channelled, quilled or flat.
- Fracture : short, granular etc
- Odour : any specific smell
- Taste any specific taste

Microscopic Study

Thin sections that floated in water were selected and moved to a watch glass having safranin stain using a thin brush. Sections were kept for 1 minute. The sections were then to pure water to remove excess stain and made ready to mount on the slide. Two stained section was carefully transferred on a clean glass slide using thin brush. Two drops of glycerine was put on the section using a dropper, a clean cover slip was placed gently over the section. The excess glycerine was removed and the slide was placed gently over the trinocular microscope for histological evaluation and the images were taken at 4x, 10x and 40x magnification.

Powder Microscopy: Microscopic slides were prepared by soaking a pinch of fine powder in distilled water for 1 hr. It was then transferred to a glass slide using a brush and visualised under compound microscope, then under trinocular microscope.

RESULTS AND DISCUSSION

Sample Collection

Fresh samples were taken from the garden for pharmacognostical study. The genuine sample of *Strobilanthes barbatus* Nees which collected from its natural habitat cleaned by thorough washing and dried

in shade (Fig.2). The powdered dry drug was kept in air tight containers (Fig.3). This powder was used for powder microscopy.

Table 1: Weight of Drug in Different Stages of Collection

Sample	Weight
Fresh sample	3.5kg
After shade dry	980gm
After the drug has been powdered	860gm

Macroscopic Study

In the macroscopic analysis of the stem (Fig.4), the shape was almost rectangular in outline, with a lamina like wing structure projecting from four angles. It is dark green in colour with creamish yellow spots. It is having a characteristic faint smell and bitter taste.

Table 2: Organoleptic Evaluation of Stem of *Strobilanthes Barbatus* Nees

Shape and Size	Almost rectangular in outline, with a lamina like wing structure projecting from four angles.
Colour	Dark green colour with creamish yellow spots.
Texture	Smooth
Odour	Characteristic faint smell
Taste	Bitter

Macroscopic analysis of leaf (Fig.5) revealed that it is simple, petiolate, oppositely arranged in unequal pairs, elliptic-lance shaped, about 15 x 8 cm, entire, rounded-toothed or wavy at margin, pointed at tip, leathery, lateral nerves 7-12 pairs, leaf-stalks winged, about 5 cm long, often swollen at leaf base, eared at base (when winged).

Table 3: Organoleptic Evaluation of Leaf of *Strobilanthes Barbatus* Nees

Shape	elliptic-lance shaped,
Size	about 15 x 8 cm
Colour	glabrous, rarely puberulous
Texture	Coriaceous
Odour	Nothing specific
Taste	Bitter

Fig.1: Genuine Sample Source of *Strobilanthes barbatus* Nees From its Natural Habitat.



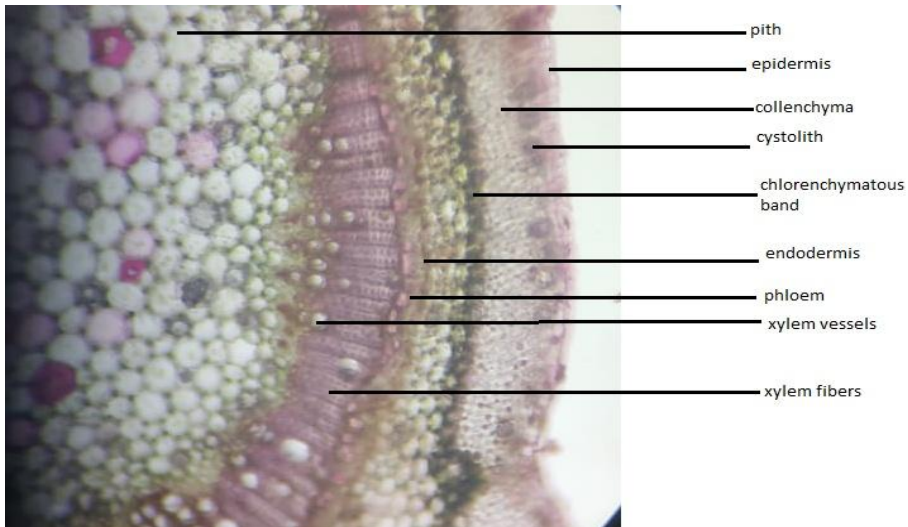
Fig.2: *Strobilanthes barbatus* Nees after Shade Dry

Fig. 3: Powder of *Strobilanthes barbatus* Nees



Fig.4: Macroscopy of the stem of *S.barbatus* Nees

Fig.5: Macroscopy of the leaf of *S. barbatus* Nees



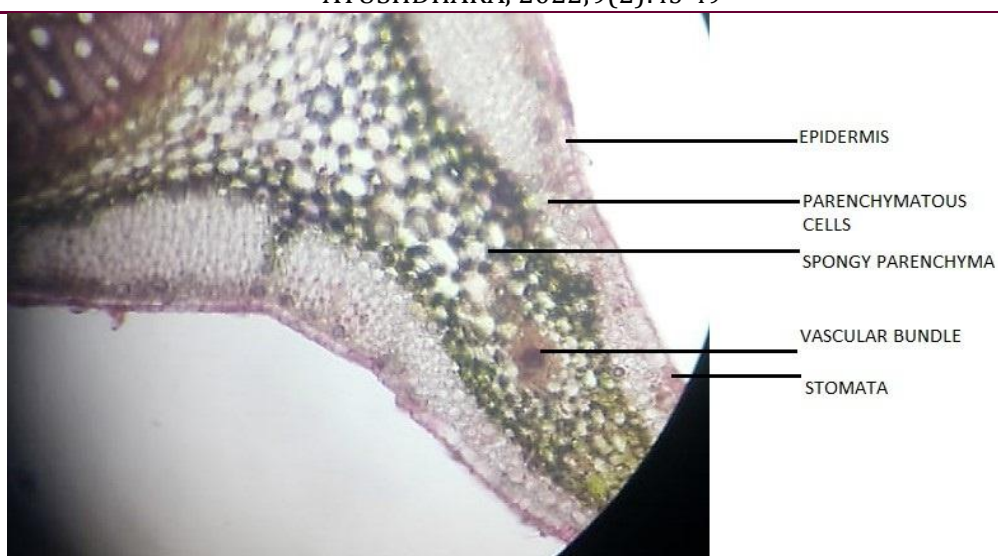


Fig. 6: Microscopic Image of Stem of *Strobilanthes barbatus* Nees

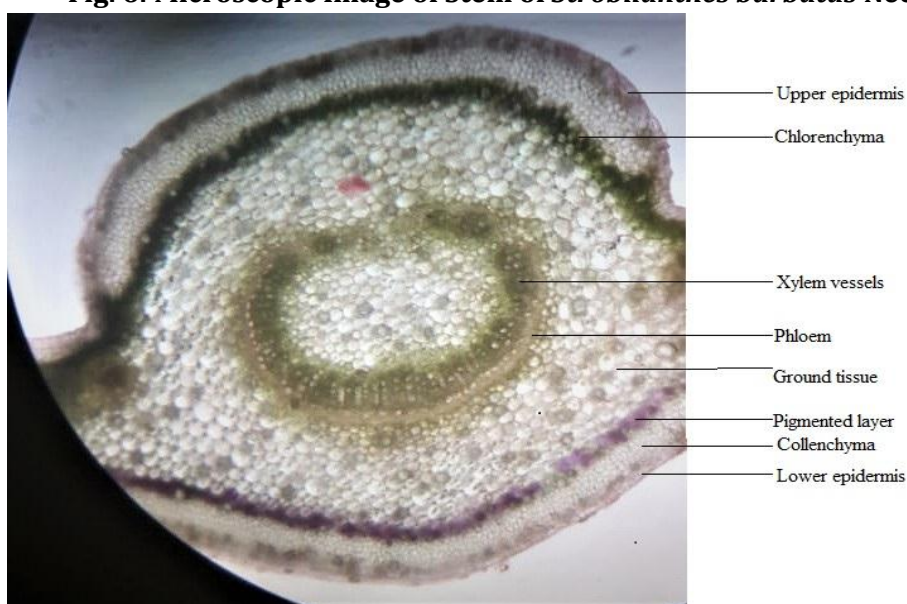


Fig. 7: Microscopic Analysis of Leaf of *Strobilanthes barbatus* Nees

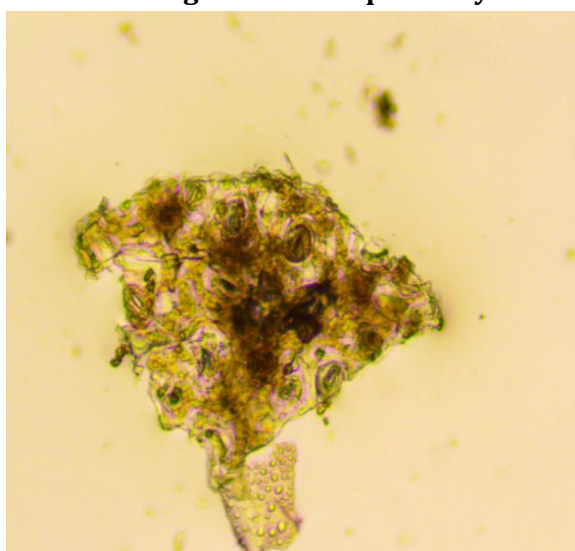


Fig. 8(a): Stomata and Trichome

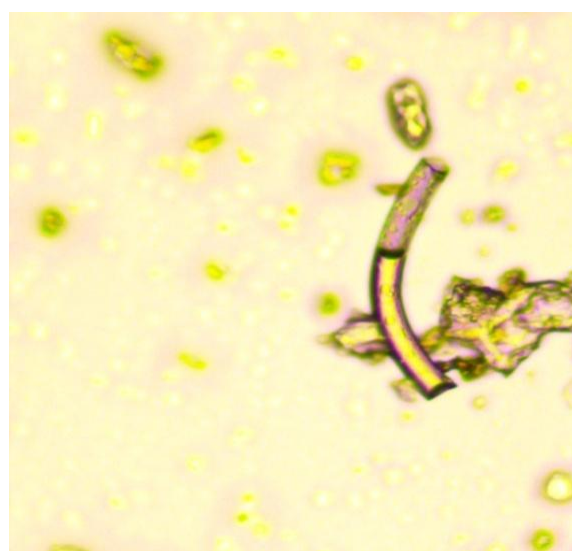


Fig. 8(b): Pitted Vessel

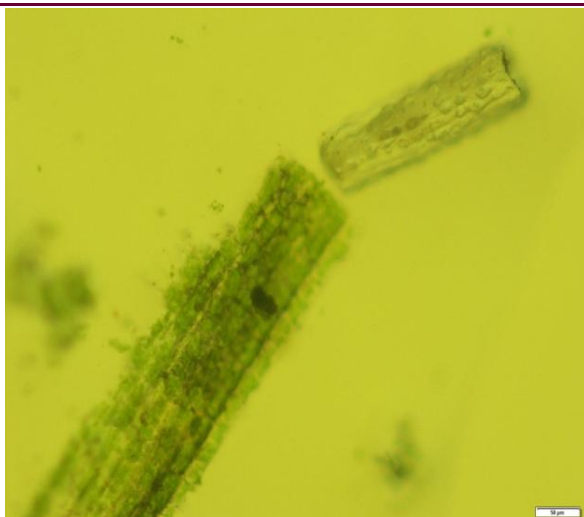


Fig. 8(c) Pitted Vessel Along with Xylem Parenchyma



Fig. 8(d): Fibre

Microscopic Study

Microscopic analysis of stem of *Strobilanthes barbatus* Nees (Fig.6) showed the presence of epidermis, hypodermis, endodermis, vascular bundles and pith. The epidermis consists of single layer of parenchymatous cells. Hypodermis consists of outer collenchyma and inner parenchyma. Collenchymal hypodermis consists of 8-10 layers of cells. Presence of cystolith is seen towards the outer layers of collenchymatous hypodermis. Inner hypodermis consists of parenchyma cells with a single layer of chlorophyllated cells present in between the collenchyma and parenchyma. The epidermis and hypodermis extend to the wing portion of the stem. Presence of calcium oxalate crystals are seen in the parenchyma. A single layer of endodermis is present inner to it. Vascular bundle is conjoint collateral and open type. Xylem is endarch. Central pith consists of loosely arranged parenchymatous cells.

The microscopic analysis of leaves of *Strobilanthes barbatus* Nees (Fig.7) consists of epidermis, vascular bundle and ground tissue. Beneath the epidermis 8-10 layers of collenchymatous cells are present. 3-4 layers of parenchymatous cells are present just below the collenchymatous cells. Ground tissue filled with polygonal parenchymatous cells. Circular shaped vascular bundle is present. Vascular bundle is conjoint, collateral, closed type with phloem

toward outer and xylem inner to it. Presence of cystolith is seen throughout the ground tissue.

Powder Microscopy: In powder microscopy (Fig.8), pitted vessels, fibre, stomata and trichomes were observed.

CONCLUSION

Pharmacognostical studies play a very important role in identifying the genuineness and purity of a plant. The current study has dealt with the detail pharmacognostic and phytochemical analysis of *Strobilanthes barbatus* Nees. Macroscopic and microscopic features of a plant help in the proper identification of the plant. The current study drug shares similar morphological features to that of *S. ciliatus*. *Strobilanthes barbatus* could be easily propagated and cultivated.

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