



## Research Article

**PHARMACOGNOSTICAL STUDY OF *OSBECKIA MURALIS* NAUDIN.**Binu B<sup>1\*</sup>, Subrahmanya Padyana<sup>2</sup>, Sunil Kumar<sup>3</sup><sup>1</sup>PhD Scholar, <sup>2</sup>Professor and Head, Department of Post Graduate studies of Dravyaguna, Alvas Ayurveda Medical College, Moodbidri, Karnataka, India.<sup>3</sup>Senior Research Officer, SDM Centre for Research in Ayurveda and Allied Sciences, Udupi, Karnataka, India.**KEYWORDS:** *Osbeckia muralis* Naudin, Macroscopic study, Microscopic study, Powder microscopy.**ABSTRACT**

The plant '*Nela Nekkarika*' in Kannada, '*Cherkulathi*' in Malayalam and '*Cen-Thumbai*' in Tamil is botanically identified as *Osbeckia muralis* Naudin belongs to the family Melastomaceae. This herb is commonly used by the ethnomedical practitioners of the Dakshina Kannada District of Karnataka State. It is an encouraging ethnomedicine in the respiratory ailments especially in cough. This is an herb endemic to Western Ghats. Some of the practitioners from the foot hills of Western Ghats are using other species of *Osbeckia* which looks similar to *Osbeckia muralis* Naudin. None of the classical Ayurvedic literatures had mentioned about this plant. Hence to explore its identity, pharmacognostical study of *Osbeckia muralis* Naudin is undertaken. For the purpose of standardization, macroscopic, microscopic and powder microscopic studies has been carried out. The morphological study shows that the herb is a 30 cm tall less branched hirsute herb with elliptic shaped leaves tetramerous flowers and purple petals. The microscopic study of the stem and the leaf has been carried out which shows chlorenchyma cells, glandular trichomes, multicellular covering trichomes, calcium oxalate crystals, pallisade parenchyma and spongy parenchyma etc. The powder microscopic study shows multiserrate trichome, glandular trichome, pith parenchyma etc. This study can help for the standardization and authentication of the genuine drug.

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**INTRODUCTION**

Plants are playing very active role in life. There is a need for the record of all the researches carried out on plants in the form of documentation. So, it becomes important to make surety about the standardization of plants used as medicine. For the process of standardization, we can use different techniques and methodology to achieve our goal in the systematic manner.eg. Pharmacognostic and phytochemical studies. These processes are helpful in identification and standardization of plant material. Correct characterization and quality assurance of starting material is an essential step to ensure reproducible quality of herbal medicine which will help us to justify its safety and efficacy [1-4]. For these purpose pharmacognostic studies of *Osbeckia muralis* has been carried out. In the present study the investigational focus was on the plant *Osbeckia muralis* Naudin. It belongs to Melastomaceae family [5]. It is an endemic herb of Western Ghats[6]. There is no reference about the drug in any of the classical Ayurvedic books. Some folklore practitioners from the foot hills of Western Ghats especially in Dakshina Kannada District, are using the leaves of *Osbeckia muralis* Naudin. which is commonly known as '*Nela Nakkarika*' in Kannada, in

different forms like *Swarasa* and *Kashaya* mainly in cough[7].

**AIMS AND OBJECTIVES**

1. To explore the identity of *Osbeckia muralis* by Macroscopic study
2. To evaluate *Osbeckia muralis* by Microscopic study
3. To evaluate the identity of *Osbeckia muralis* by powder microscopy.

**MATERIALS AND METHODS**

**Study centre:** The study has been conducted at SDM centre for Research in Ayurveda and Allied Sciences, Udupi.

**Macroscopic study:** Different macroscopic parameters of stem and leaves were noted. Leaves evaluation include presence or absence of petioles and different characters of lamina i.e., shape indentations, base texture, venations apex[8]. External features were recorded using Canon Ixus digital camera.

**Microscopy study:**[9] Sample was preserved in fixative solution. The fixative used was FAA (Formalin-5ml + Acetic acid-5ml+70% Ethyl alcohol-90ml). The materials were left in FAA for more than 48 hours. The preserved

specimens were cut into thin transverse section using a sharp blade and the sections were stained with saffranine. Transverse sections were photographed using Zeiss AXIO trinocular microscope attached with Zeiss AxioCam camera under bright field light. Magnifications of the figures are indicated by the scale-bars.

**Powder microscopy:** Shade dried leaves were finely powdered and studied under microscope. A pinch of the sample was mounted on a microscopic slide with a drop of glycerin-water<sup>[9]</sup>. Characters were observed using Zeiss AXIO trinocular microscope attached with Zeiss AxioCam camera under bright field light. Magnifications

of the figures are indicated by the pre-calibrated scale-bars using Zeiss Axio Vision software.

## RESULTS AND DISCUSSION

### Macroscopic Study

An erect herb; stem simple less branched, hispid. 30cm height. Leaves are 5x2.5cm, ovate/elliptic, hirsute, 3-5 nerved from the base; petioles upto 4mm long. Flowers tetramerous, capitate, often with 2/4 leaves close under the head. Calyx tube in fruit 4mm long with 4 short lobes, bristly. Petals purple. Anthers short, truncate at apex.

In the figures macroscopy of different parts has been shown. Macroscopy of Aerial parts (Fig.No1.1), A twig (Fig 1.2) and A leaf (Fig 1.3) has been shown.

**Figure 1. Macroscopy of *Osbeckia muralis***



**Fig 1.1 Aerial parts**



**Fig 1.2 A twig**



**Fig 1.3 Leaves**

### Microscopic Study

Stem is circular in shape with three ridges/wings. Outer epidermis have glandular trichomes and one multicellular covering trichomes. Multicellular covering trichomes and wings contain chlorenchyma cells. Cortex is having rosette crystals of Calcium oxalate. Endodermis with one layer covers pericycle. Centre Pith encircles vascular bundles, contains xylem and phloem. Pith composed of parenchyma cells as shown in Fig 2. (Fig2.1 & 2.2) Transverse section of leaf showing the continuation of epidermis on either side of midrib covered by cuticle. Trichomes are present on epidermis. Mesophyll consists of a layer of compactly arranged palisade parenchyma within the upper epidermis and loosely arranged spongy parenchyma within the lower epidermis. Lamina contains calcium oxalate crystals as shown in Fig 3 (Fig 3.1&Fig 3.2).



Figure 2. Microscopy of stem of *Osbeckia muralis*

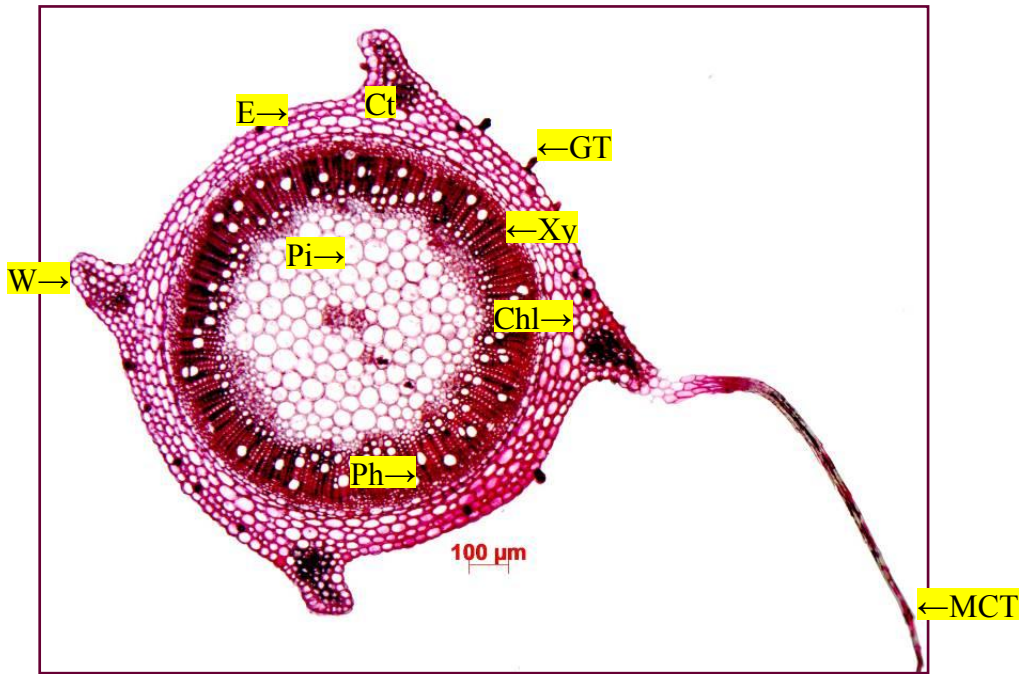


Fig 2.1 TS of stem

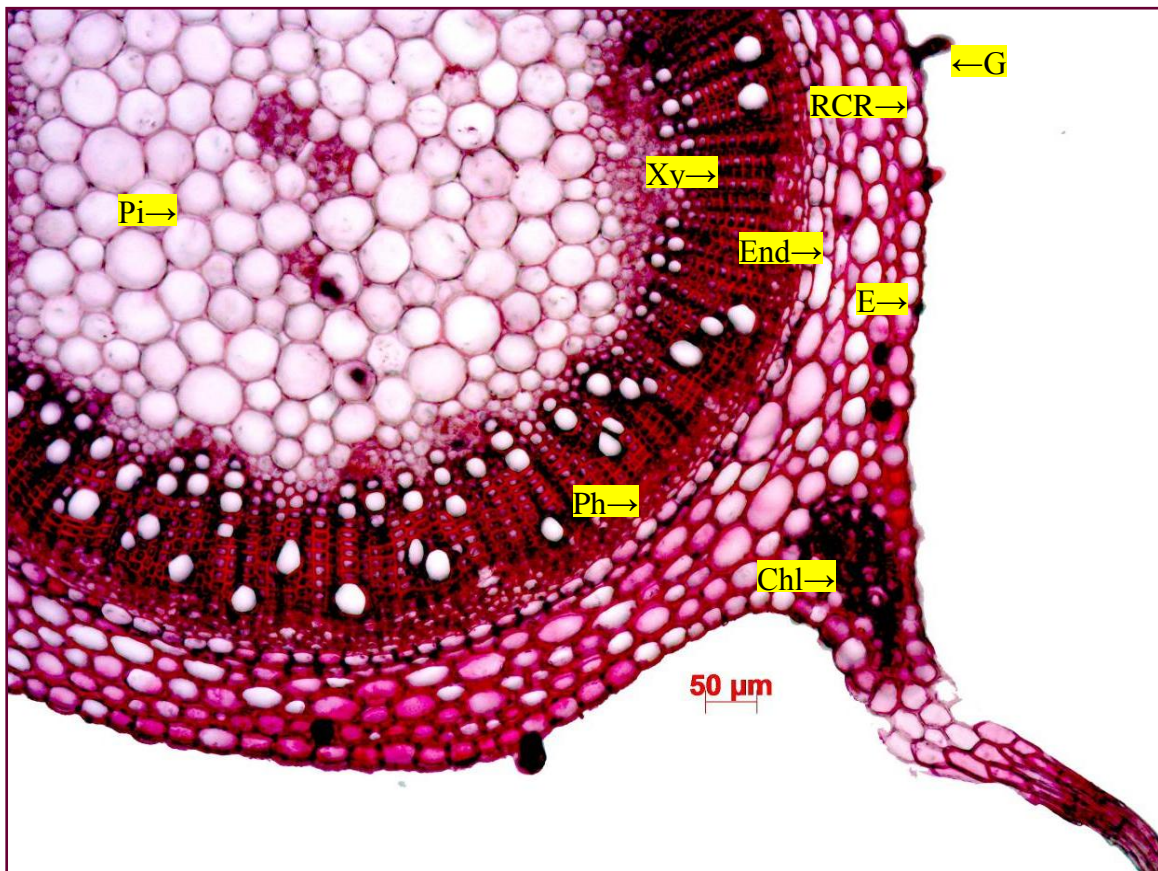


Fig 2.2 A portion of TS enlarged

**Chl** - chlorenchyma; **E** - epidermis; **End** - endodermis; **GT** - glandular trichome; **MCT** - multi cellular covering trichomes; **Ph** - phloem; **Pi** - pith; **RCR** - rosette crystal of calcium oxalate; **W** - wing; **Xy** - xylem.

Figure 3. Microscopy of petiole of *Osbeckia muralis*

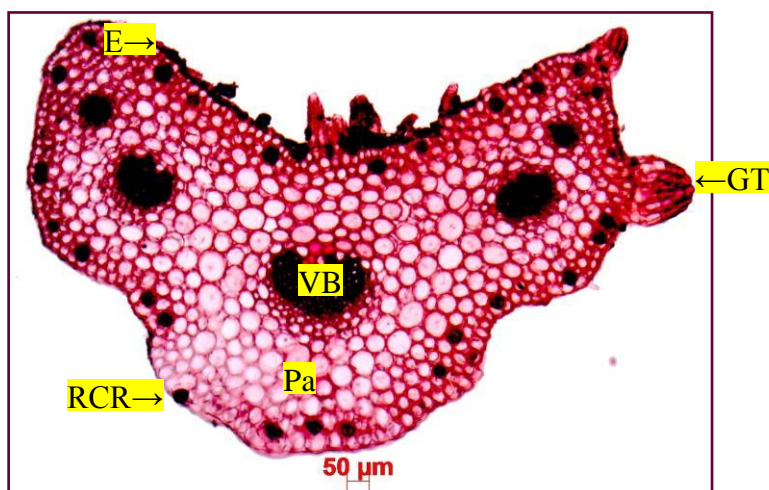


Fig 3.1 TS of petiole

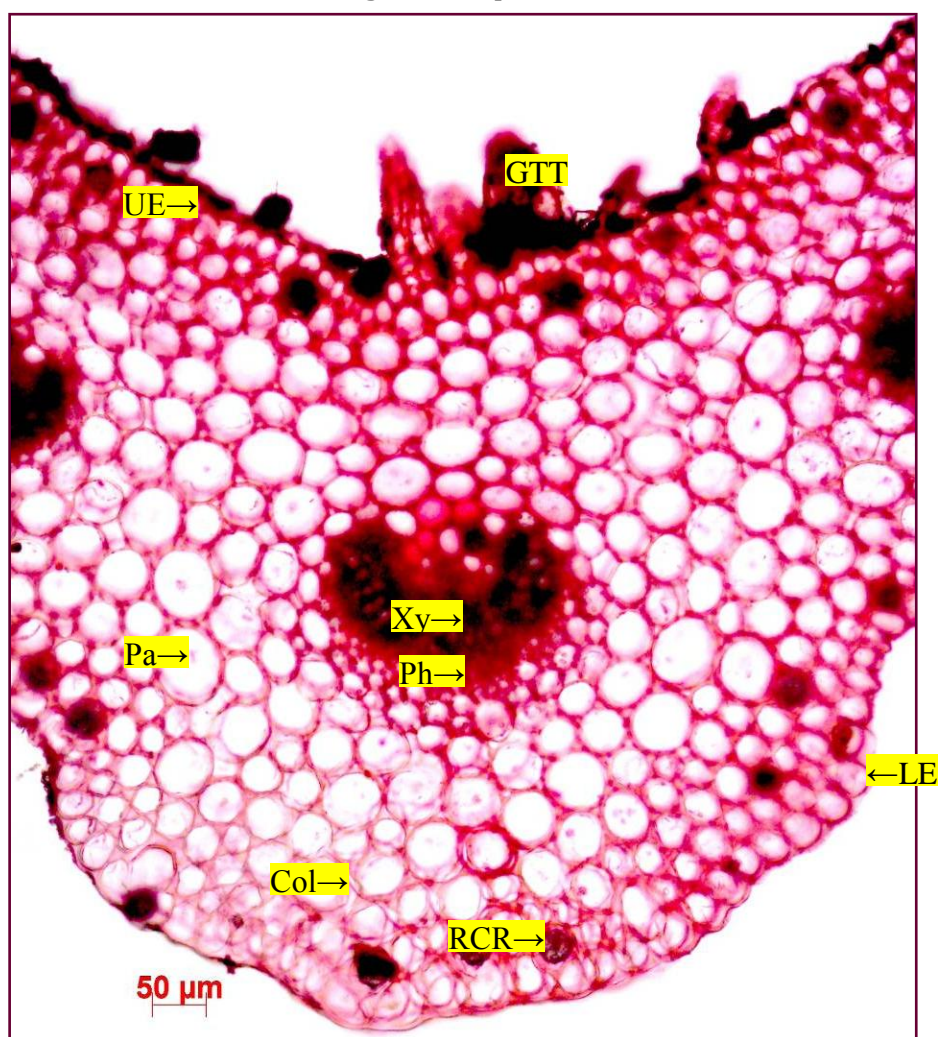


Fig 3.2 A portion of TS enlarged

Col – collenchyma; E – epidermis; GT – glandular trichome; LE – lower epidermis; Pa – parenchyma; Ph – phloem; RCR – rosette crystal of calcium oxalate; UE – upper epidermis; Xy – xylem.



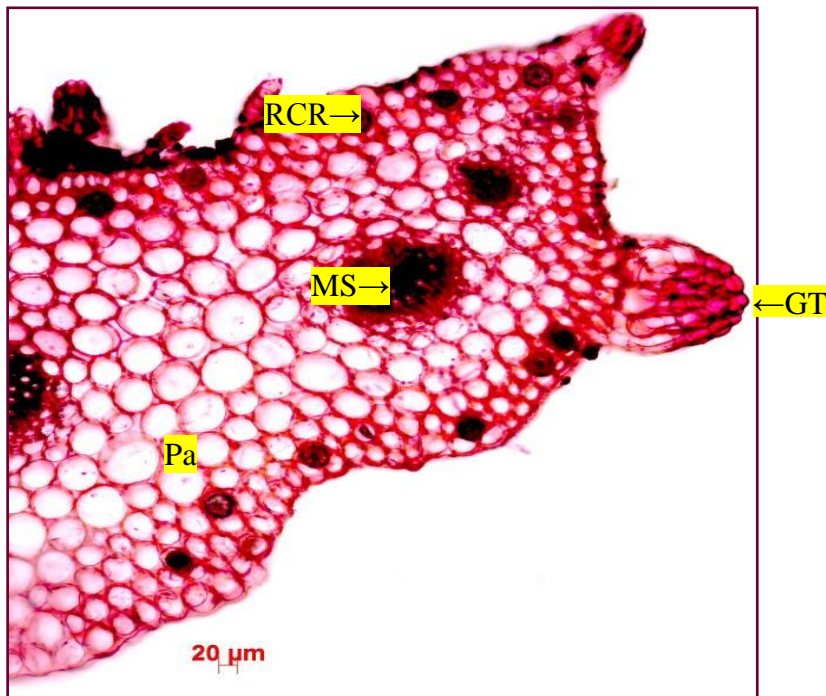


Fig 3.3 Meristele

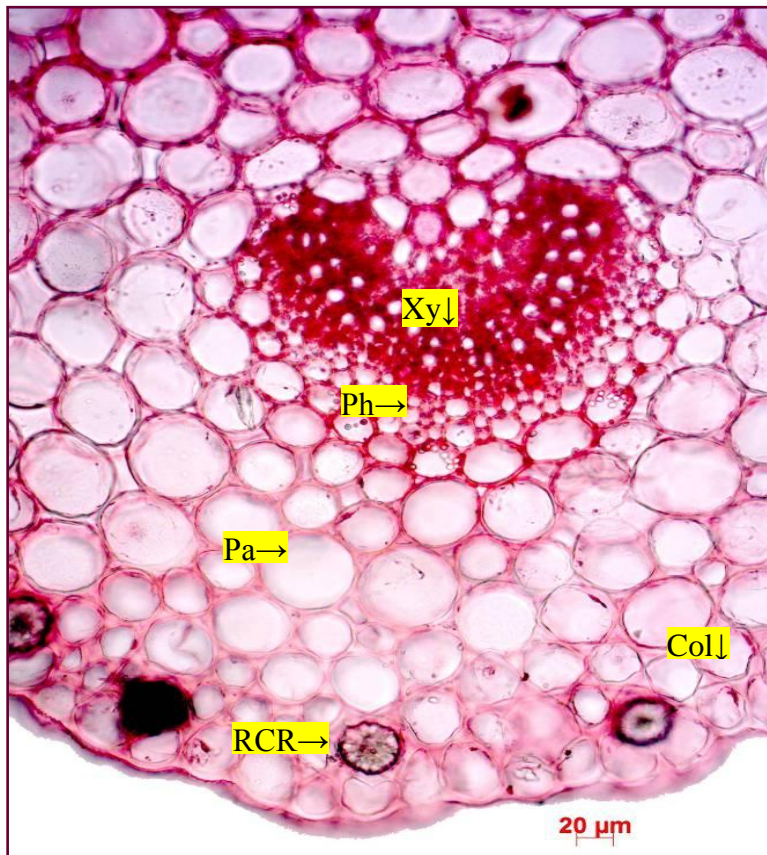


Fig 3.4 Vascular bundles and rosette crystals

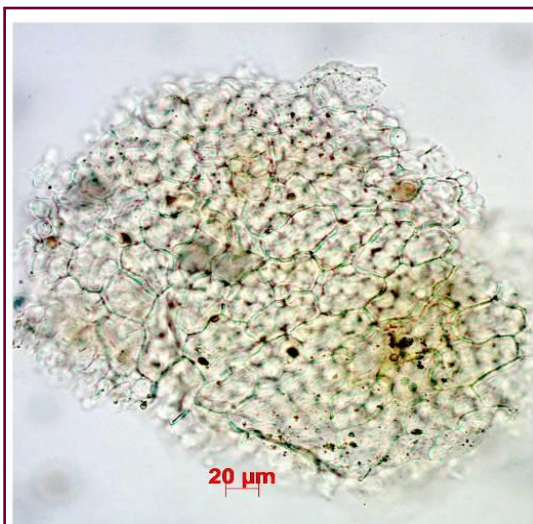
**Col** – collenchyma; **E** – epidermis; **GT** – glandular trichome; **LE** – lower epidermis; **MS** – meristele; **Pa** – parenchyma; **Ph** – phloem; **RCR** – rosette crystal of calcium oxalate; **UE** – upper epidermis; **Xy** – xylem.

**Powder Microscopy (Fig 5)**

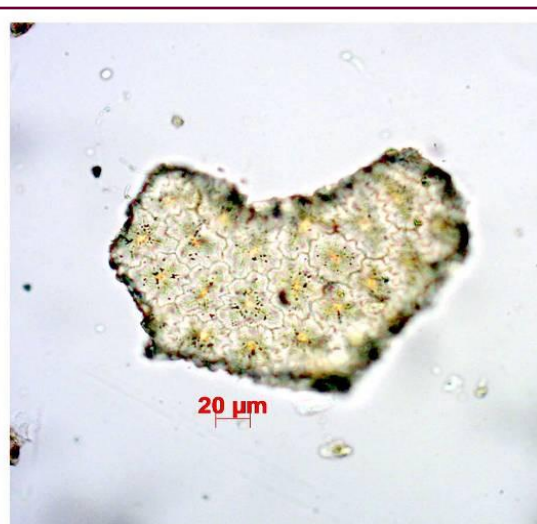
The powder microscopy showing the Upper epidermis in surface view(Fig 5.1), Lower epidermis in surface view(Fig 5.2) Multiseriate trichome (Fig 5.3), Glandular trichome (Fig5.4) Base of Multiserriate trichome (Fig5.5), Apex of

multiseriate trichome (Fig 5.6), parenchyma of trichome base (Fig 5.7), Xylem elements in Mesophyll (Fig5.8) Rosette crystal fibres (Fig 5.9), Vascular elements (Fig 5.10), Pith parenchyma (Fig5.11)

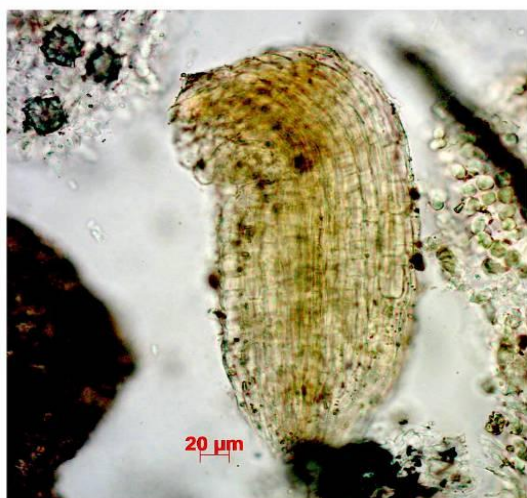
**Figure 5. Powder microscopy of leaf of *Osbeckia muralis***



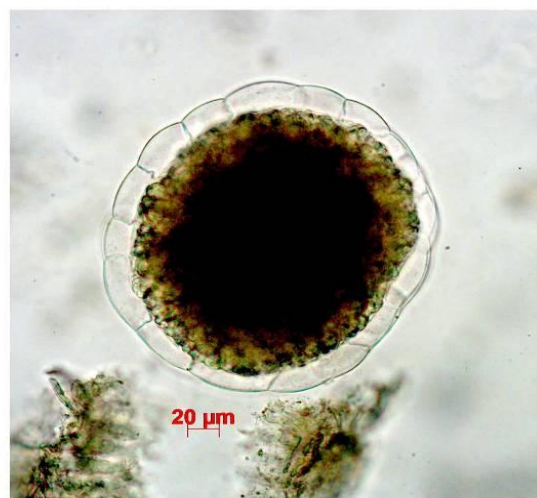
**Fig 5.1** Upper epidermis in surface view



**Fig 5.2** Lower epidermis in surface view



**Fig 5.3** Multiseriate trichome



**Fig 5.4** Glandular trichome

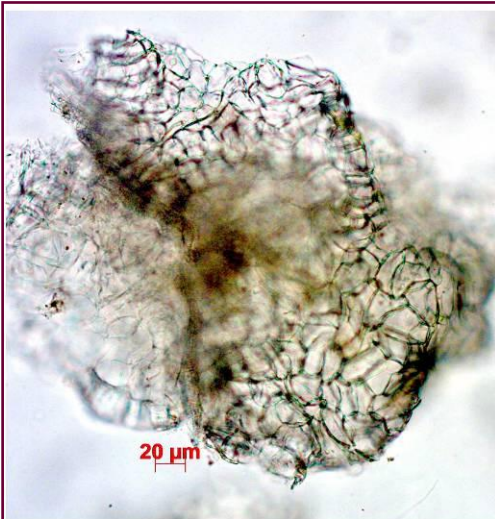


**Fig 5.5** Base of a multiseriate trichome

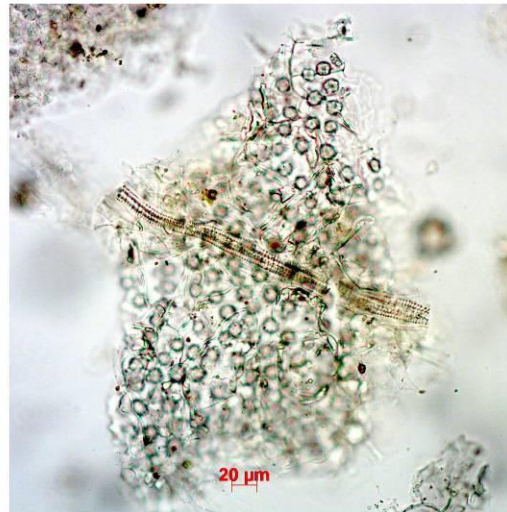


**Fig 5.6** Apex of a multiseriate trichome

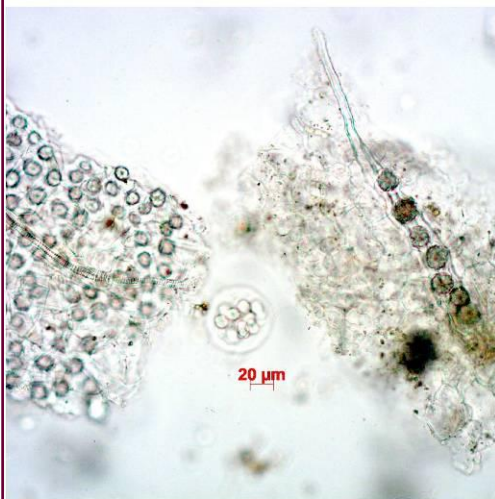




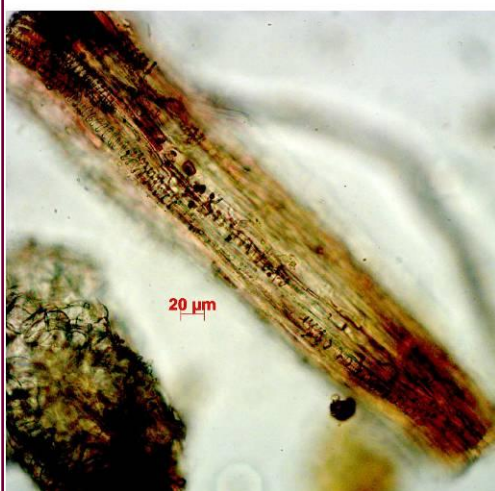
**Fig 5.7** Parenchyma of trichome base



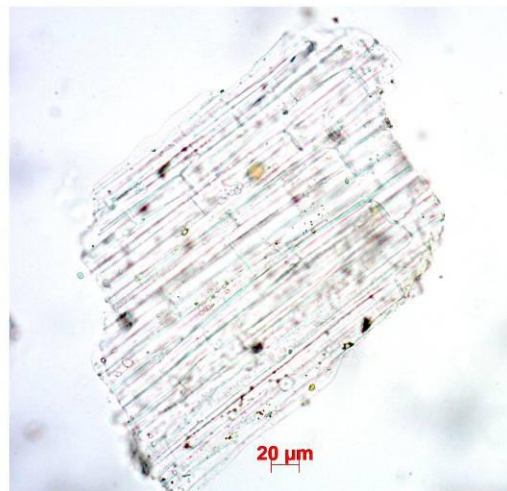
**Fig 5.8** Xylem elements in mesophyll



**Fig 5.9** Rosette crystal fibres



**Fig 5.10** Vascular elements



**Fig 5.11** Pith parenchyma

**CONCLUSION**

The plant 'Nela Nekkarika' in Kannada, is botanically identified as *Osbeckia muralis* Naudin belongs to the family Melastomaceae, commonly used by the ethnomedical practitioners of the Dakshina Kannada District of Karnataka State. The plant is an encouraging

ethnomedicine in cough. Hence to explore its identity, pharmacognostical study of *Osbeckia muralis* Naudin is undertaken. Hirsute leaf with 3-5 nerves from the base is the identifying character of the plant. Microscopically, the leaf shows glandular trichomes and multicellular

covering trichomes. Cortex is having rosette crystals of Calcium oxalate.

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