



## Morphological and Anatomical Studies of the Medicinal Seeds of *Abelmoschus Moschatus* Medik.

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### Research Article

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### Abstract

*Abelmoschus moschatus* Medik syn. *Hibiscus abelmoschus* Linn belonging to family Malvaceae, commonly known kasturibhendi (H), muskmallow, ambrette (E) is an aromatic and medicinal plant. The present investigation was aimed to determine the morphological and anatomical characters of plant. Anatomical studies of the seeds revealed the presence of endosperm, calcium oxalate crystals, starch grains and oil globules. The data obtained in present study will serve as valuable tool for identification, authentication and detection of adulterants, standardization and quality control of the selected plant.

**Key words:** *Abelmoschus moschatus*, Seeds, Morphology, Anatomy

### INTRODUCTION

*Abelmoschus moschatus* Medik. is an aromatic and medicinal plant in the Malvaceae family, which is native to India. It is an erect hispid herbaceous trailing herb that grows up to 1.5m tall with a long slender tap root. Leaves are alternate, rough, hairy and heart-shaped. They have 3 to 5 lobes and can grow to 15cm long. Flowers resemble those of the hibiscus and are usually watermelon pink, although they are sometimes white or cream in colour. They last for only one day and their flowering depends on the timing of the wet season. Seeds are contained within hairy capsules up to 8 cm long, which are

tough but papery. The seeds have a sweet, flowery, heavy fragrance similar to that of musk.<sup>1-2</sup>

Every part of this medicinal plant is used in one or the other way. Seeds are effective aphrodisiac and antispasmodic, and used in tonics. They check vomiting and are useful in treating intestinal disorders, urinary discharge, nervous disorders, hysteria, skin diseases etc. The mucilaginous seeds are emollients and demulcents. Flower infusion is contraceptive. Different parts of the plant have uses in traditional and complementary medicine, not all of which have been scientifically proven. It is used externally to relieve spasms of the digestive tract, cramp, poor circulation and aching joints. It is also considered an insecticide and an aphrodisiac. In India, roots, leaves (rarely), and seeds of ambrette are considered valuable traditional medicines. The bitter, sweet, acrid, aromatic seeds are used as a tonic and are considered cooling, aphrodisiac, opthalmic, cardiotoxic, digestive, stomachic, constipating, carminative, pectoral, diuretic, stimulant, antispasmodic, deodorant, and effective against kapha and vata, intestinal complaints, stomatitis; and diseases of the heart. According to Unani system of medicine seeds allay thirst, cure stomatitis, dyspepsia, urinary discharge, gonorrhoea, leucoderma and itch. Roots and leaves are cures for gonorrhoea.<sup>3-5</sup> Despite of its numerous medicinal attributes, till date no work was reported on the anatomical examination of seeds of selected plant. Therefore, the present investigation was undertaken to set standards and revealed the anatomical features of the seed.

### MATERIAL & METHODS

#### Selection, collection and authentication of plant/plant material

The seeds of the selected plant (*Abelmoschus moschatus* Medik.) were collected from Jawaharlal Nehru Agriculture University (JNKVV) Jabalpur, Madhya Pradesh and were identified and authenticated by Dr. J. L. Shrivastava, Scientist & Head, Biodiversity and Medicinal Plant, State Forest Research Institute, Jabalpur, (M.P.).



## Study of morphological characters

### Macroscopic characters

Various morphological characteristics of the plant along with details of the seed morphology were studied.<sup>6</sup>

### Anatomical features

The specimens of the proposed study were collected, care was taken to select healthy part and for normal organs. Then required samples of organ were fixed in FAA (formalin-5ml+ Acetic acid 5ml+ 70% Ethyl alcohol-90ml). Free hand transverse sections of fresh stem were taken, cleaned in chloral hydrate solution with gentle warming, stained with phloroglucinol and concentrated hydrochloric acid. They were mounted on slide in glycerine and studied under microscope. Microphotographs of sections were documented using microscope with camera, Nikon (14 mp). Descriptive terms of the anatomical features are as given in the standard anatomy book<sup>7-8</sup>. The figure and details are given in the results.

### Powder Microscopy

The stem was powdered and fine powders were taken in glass slide mounted with glycerine and was observed in microscope<sup>8</sup>, photographs were taken using microscope with camera, Nikon (14 mp).

## RESULTS & DISCUSSION

*Abelmoschus moschatus* Medik (Kasturi bhendi), belongs to the family Malvaceae is volatile oil yielding medicinal and aromatic plant widely used as perfumery and were used in different system of medicine in the treatment of various diseases was selected for present investigation. The scanty availability of information on this plant facilitates to study the morphological and anatomical features of the plant.

### Morphology of seeds

The seeds are small, ovoid-reniform, endospermic with hard seed coat, brown in colour, having a sweet, flowery, heavy fragrance similar to that of musk. (Table 1 & fig. 1)

**Table 1: Morphological observations of *Abelmoschus moschatus* Medik.**

S/No.	Parameters	Observations
1.	Color	Brown
2.	Shape	Reniform
3.	Appereance	Hard seed coat
4.	Odor	Musk like on crushing the seeds
5.	Seed length	0.5 cm
6.	Seed width	0.7 cm



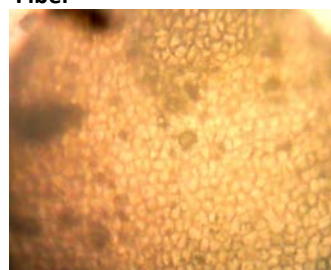
**Fig. 1: Morphology of seeds *Abelmoschus moschatus* Medik**

### Anatomical features

Microscopy of seeds (Powder as well as T.S.) reveals the presence of fibers, parenchymatous cells, epidermal cells, endosperm containing of oil globules with calcium oxalate crystals. A typical malvaceous seed which is dicot, bitegmic and is composed of epidermis, embryo and endosperm. Epidermis is 2-3 layered consists of testa and tegnum. Outer layer above epidermis in testa and inner layer below epidermis is tegnum. A thin layer of perisperm is present which in papery in nature. Below perisperm few layer of parenchymatous cells are also present which constitute the vascular bundles. Thick walled rectangular shaped endosperm is present beneath the epidermis which is cellular in nature. It consists of oil globules, starch grains and calcium oxalate crystals. (Fig. 2 & Fig. 3)



**Fiber**



**Parenchymatous cell**



purity of the selected plant. Hence, these findings will be helpful in the correct identification, identity and purity of the selected medicinal plant.

### Acknowledgement

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### AUTHORS' CONTRIBUTIONS

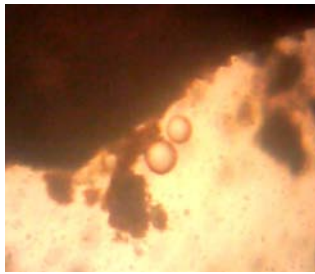
Authors contributed equally to all aspects of the study.

### PEER REVIEW

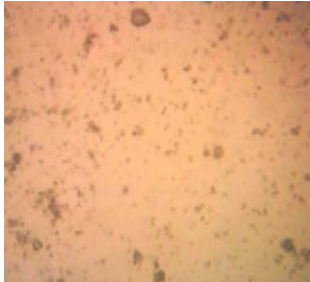
Not commissioned; externally peer reviewed.

### CONFLICTS OF INTEREST

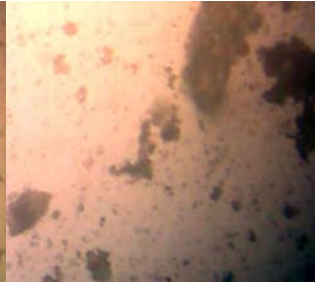
The authors declare that they have no competing interests.



Oil globules



Starch grains



Endosperm



Ca oxalate crystals

Fig. 2: Powder microscopy of seeds

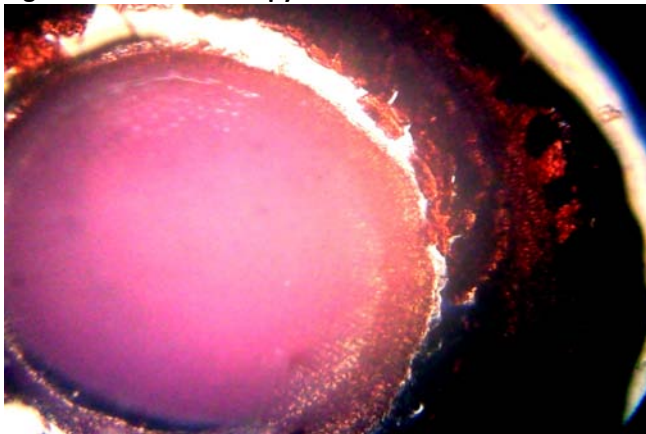


Fig. 3: Anatomy of seed

T: Testa, Ep: Epidermis, P: Perisperm. Pc: Parenchymatous cells, En: Endosperm, O: Oil globules, S: Starch grains

### CONCLUSION

The present paper revealed the external and internal structures of seeds of *Abelmoschus moschatus* Medik were studied and reported. These studies can be used as a diagnostic tool for the correct identification of the species of *Abelmoschus*. Therefore, these features are useful in detecting the adulterants if any in this plant and will lead to efficacy and