Pharmacognostical Study

Pharmacognostic study of *Lepidium sativum* Linn (Chandrashura)

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**Abstract**

Pharmacognosy is the study of naturally occurring biological substances, principally those derived from plants that find use in medicine. The word “Pharmacognosy” is derived from the Greek “Pharmacon,” “a drug” and “gignosco,” to acquire knowledge of. It is closely related to both botany and plant chemistry and both originated from the earlier scientific studies on medicinal plant. The plant kingdom still holds many species of plants containing substances of medicinal value which have yet to be discovered large number of plants constantly being screened for their possible pharmacological value. The plant Chandrashura is being used for the treatment of Amavata, Sandhivata, and Katishula successfully. Here, an attempt is made to study the plant pharmacognostically; the part taken for study is the seed. Diagnostic features of seed and seed powder were also worked out and the details were presented.

**Key words:** Amavata, gignosco, katishula, pharmacon, sandhivata

**Introduction**

In the beginning of the 20th century, the subject pharmacognosy had developed mainly on the botanical side, being particularly concerned with the description and identification of drugs, both in the whole state and in powder, and with their history, commerce, collection, preparation, and storage. Such branches of pharmacognosy are still of fundamental importance, but rapid development in other areas, particularly Phytochemistry and Pharmacology have enormously expanded the subject. As a result, it is now possible to approach the study of medicinal plants from the botanical photochemical and pharmacological viewpoints (Trease and Evans 14th ed.1997). The plant Chandrashura is being used for the treatment of Amavata, Sandhivata, and Katishula successfully.

**Aims and Objectives**

To standardize the identification of the seeds of plant *Lepidium sativum* Linn; a pharmacognostic study including microscopic and macroscopic characters of the seed and seed powder was carried out.

**Materials and Methods**

**Collection of sample**

The plant material required for the present study was collected from the campus of Gujarat Ayurved University. The collection of plant was done in the month of April, 2004; the plant was uprooted without damaging the root system. The collected material was put into container and stored. The plant specimen was authenticated by expert of Botany from the department of Pharmacognosy GAU, Jamnagar.

**Processing and preservation**

The seed of *L. sativum* was collected and preserved. Macroscopic and microscopic characters of seed and seed powder were studied systematically. Transverse and Longitudinal sections were prepared for microscopic examination. Standard stains and chemical reagents were used in all these studies.

**Morphology of the plant**

It is an erect branched, glabrous herb with 60 cm height. Leaves are entire or pinnately dissected, variously lobed often with linear segments; up to 6-5 cm long and lobes are 0.7-1.2 to 0.3-0.6 cm size, upper leaves usually entire, and 2-3 cm long, oblanceolate, sessile.

Racemes are 7 to 15 cm long axillary and terminal; flowers are white or pale pink; pedicels are 3 to 5 mm long. Pods are obovate or broadly elliptical, roundate, emarginated slightly but thickly winged above.
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Seeds are small, oval-shaped pointed, and triangular at one end, smooth about 2 to 3 mm long and 1 to 1.5 mm wide, reddish brown, an arrow present on both surfaces, extending up to two-thirds downwards, a slight wing-like extension present on both the edges of seed when soaked in water seed coat swells and gets covered with a transparent, colorless mucilage.

**Taxonomic Classification**

*Plant Chandrashura.*

*(Lepidium sativum Linn)*

- **Kingdom** = Plantae
- **Division** = Angiospermae
- **Class** = Dicotyledonae
- **Sub Class** = Polypetalae
- **Series** = Thalamiflorae
- **Order** = Parietales
- **Family** = Cruciferae (Brassicaceae)
- **Genus** = Lepidium Linn
- **Species** = *Lepidium sativum* Linn sp.

Classification of Family Cruciferae (Brassicaceae) was mentioned by the various taxonomists. This family consists of 220 Genera and 1 900 species [Figures 1 and 2]

**Family Feature**

**Cruciferae—Mustard family**

These are herbaceous plants, often with stellate hairs, whose flowers have four distinct sepals and four petals. The stamens
are six and are termed tetradymanous, because one pair is longer than the other two pairs.

There is a single pistil whose ovary is superior, two located, four carpelled, and has parietal placentation. The styles are short or absent and with two stigmas. The fruit is a modified capsule, usually dehiscing by two lateral valves (having a central septum) and when long and slender is termed a siliqua or when short and squat is termed a silicle. The arrangement of cotyledons and radical within the seed provide characters of taxonomic importance. The cotyledons may be acumbent, incumbent, conduplicate, or double acumbent.\(^7\)

**Distribution**

This plant is a native of Mediterranean region. Now, it is being cultivated throughout India—very likely indigenous in West Asia. In India, it is mainly cultivated in U.P., Rajasthan, Gujarat, Maharashtra, and Madhya Pradesh.\(^8\)

**Macroscopic and microscopic characters of seed Lepidium sativum**

Seed of *Lepidium* is very small, red colored, oval shape, and pointed at the end. Its size is 2 mm long and 1.5 mm broad. Seeds show micropyle and grove in between which can be easily seen in its lateral view and dorsal view. Here, its drawing is 10 times magnified due to its very small size.

**Study of seed powder of Lepidium sativum**

Microscopic slides of the powder was prepared by using various mountains including

1. Distilled water,
2. Glycerin alcohol and water,
3. Phloroglucinol and hydrochloric acid for staining lignified tissues,
4. Iodine water for testing starch grain,
5. Hydrochloric acid,
6. Sulfuric acid,
7. Acetic acid for identification of crystals of calcium oxalate and carbonates, etc. [Figures 3-5]

![Figure 4](image1.png)

![Figure 5](image2.png)
**Discussion and Conclusion**

Transverse section of seed shows uniformly thin-walled epidermis which has creamish yellow color with a number of reddish brown fragments of seed coats. Below the epidermis, there is a layer of palisade cells which are arranged symmetrically and filled with yellow coloring matter. After that, there is a layer of parenchyma cells which are colorless and thin walled. Just below it, there is a layer of endosperm. In between endosperm and epidermis, there are layer of parenchyma and cotyledons. Here, the parenchymatous cells show red coloring mater and other with uniformly thick walls endosperm oil globules.

Characters of seed powder in different view, i.e., surface view and radical view are presented. In surface view, it shows layer of epidermis and palisade cells.

Testa in surface view shows epidermis and parenchymatous cells filled with starch and coloring material. Some small oil globules are also seen.

Epidermis in surface view shows epidermis and oil globules. Under the microscope, it also shows xylem and phloem.

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