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# PHARMACOGNISTICAL STUDY OF LEAF OF PROSOPIS CINERARIA (L.) DRUCE

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**ABSTRACT**

Prosopis cineraria (L.) Druce commonly known as Shami or "Khejari" in Hindi is a small to moderate tree belonging to the family Fabaceae and a member of subfamily Mimosaceae. The present study deals macroscopic, microscopic, microchemical investigations of green and dry leaf of Prosopis cineraria (L.) Druce. Organoleptic characters of leaves of plant are Color dark green, odorless, astringent in taste. The diagnostic characters of leaves of this plant are presence of multicellular trichomes, lignified fibers, tannin containing cells and Starch grains. The information generated in this study will provide relevant pharmacognostical data needed for proper identification and authentication of leaves of this particular species. Prosopis cineraria (L.) Druce exhibits antidysentric, antileprotic, antiasthamatic actions.

## INTRODUCTION

*Prosopis cineraria* (L.) Druce (family: *Fabaceae*, subfamily: Mimosaceae) commonly known as "Khejari" in Rajasthan. It is the State tree of Rajasthan, India.[1] Khejari is the golden tree of Indian deserts, plays a vital role in preserving the ecosystem of arid and semi-arid areas. Since all the parts of the tree are useful.

Distribution& habitat: Prosopis species of spiny trees and shrubs found in sub-tropical and tropical regions of the America, Africa, Western Asia, & South Asia. The plant is distributed in the dry and arid regions of north-western India, southern India, Afghanistan, Pakistan, Arabia and Iran.[2]

**Scientific Classification[3] :**
Kingdom - *Plantae*
Class - *Angiospermae*
Order - *Fabales*
Family - *Fabaceae*
Genus - *Prosopis*
Species - *P. cineraria*
Binomial name - *Prosopis cineraria* (L.) Druce

**General description :[4]**
*Prosopis cineraria* (L.) Druce is a small moderate sized evergreen thorny tree, with slender branches armed with conical thorns and with light bluish-green foliage. It does not exceed a height of 40ft. and a girth of 4 ft., the maximum attained being 50ft. and 6ft. respectively.

**Bark** - Rough, exfoliating in thin flakes.

**Stem**- Glabrous, green or reddish, covered with prickles.

**Roots-** Primary root long, thin, lateral root few, short, fibrous, distributed down, main root: nodules present.

**Leaves-** are double compound. The leaflets are dark green, and have a tiny point. The tree is evergreen or nearly so. It produces new flush leaves before summer.

**Flower-** flowers are small in size and yellow or creamy white in color, appear from March to May after the new flush of leaves. Flowers are small, cream-yellow clustered in acute spikes with a 1-2.5 mm long peduncle.

**Pods**- The pods are formed soon thereafter and grow rapidly in size. Pods are pale yellow, 8-15 cm long x 4-8 mm wide, cylindrical and hanging, containing 10-20 seeds ovoid in shape and dark brown in color, packed in a brown pulp. Seed have a moderately hard testa. The seed retains its vitality for at least a year.

Khejari has played a significant role in the rural economy in the northwest arid region of Indian sub-continent. This tree is a legume and it improves soil fertility. It is an important constituent of the vegetation system. It is well adapted to the arid conditions and stands well to the adverse vagaries of climate and browsing by animals. Khejari is most important feed species providing nutritious and good palatable green as well as dry fodder, which is readily eaten by camels, goats, and sheep constituting a major feed requirement of desert livestock.

The leaves are of high nutritive value, locally it is called "*Loong*". The pods are a sweetish pulp and are also used as fodder for livestock. Khejari Pods are locally called "*sangar*" or "*sangri*". The dried pods locally called *"Kho-Kha*" are eaten. Dried pods also form rich animal feed, which is liked by all livestock. Green pods also form rich animal feed.[5-8]

The bark of the tree is dry, acrid, bitter with a sharp taste, cooling, anthelmintic, tonic, cures leprosy, dysentery, bronchitis, asthma, leucoderma, hemorrhoids and muscle tremors.[9] The smoke of the leaves is good for eye troubles. Leaf paste is applied on boils and blisters, including mouth ulcers in livestock and leaf infusion on open sores on the skin.[10]

## AIMS & OBJECTIVES

1. Pharmacognostical Study of leaf of *Prosopis cineraria* (L.) Druce.

## MATERIAL & METHODS

### Plant Material

The leaves of *Khejari (Prosopis cineraria* (L.) Druce) were collected from the field area near Jamdoli, Jaipur (Raj.) for the present study.

### Macroscopic Study Of Leaf

Plant was macroscopically examined for shape of leaves, apex, base, margin etc. Organoleptic characters were recorded for usual parameters like color, taste and odor.

### Microscopic Study

Qualitative anatomical studies were done. Free hand cut transverse sections of leaf were studied for different microscopic characters. The sections were stained with saffrenine. Photographs of the section were taken with the help of Carlzeiss binocular microscope attached with camera.

**Powder Analysis**[11]

The shade dried leaves were powdered, and powder was passed through 100 # sieve to get fine powder. The dried powder was mounted in the distilled water, ethenol, phloroglucinol, ferric chloride, sulphuric acid, millon's reagent, saffranine & iodine solution to detect the trichome, epidermal cells, allurone grains, tannin, lignin, protein, cellulose, calcium carbonate.

## RESULTS AND DISSCUSION

### I. Macroscopic Study:

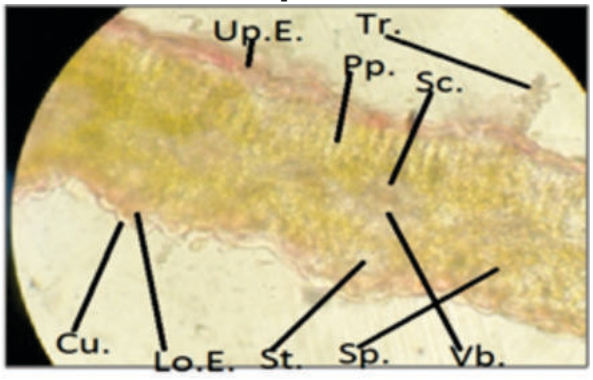
**Leaves-** Leaf is compound and alternate bipinnate with oblong shape mucoranate apex and average length of leaf is 3-7cm. Single leaflet is 4–10 mm. long and 2–4.5 mm in breadth. First leaf pinnate, rachis 0.5 inch long with occasional rudimentary or minute prickles. On an average, in a mature compound leaf, there are 7-14 paired leaflets opposite, shaped oblong with an entire margin, & mucronate apex. Leaves are dark green in color on both upper and lower surface respectively.

**Organoleptic characters of leaf:**

Color - Dark green
Odor - Odorless
Taste – Astringent

**Microscopic Characters of leaflet**[12]

The transverse section of leaf (Fig.1) showed dorsi-ventral condition with rectangular shaped cells of single layer epidermis with a thick cuticle. A bi-layered upper palisade was present on the inner side of upper epidermis respectively. Sclerenchyma forms a continuous zone connecting two or more vascular bundles, or it occurs as a patch flanking a vascular bundle. Vascular bundles were Consists of xylem, which always lies towards the upper epidermis. The phloem always lies towards the lower epidermis. A single layer lower epidermis with a thin cuticle is finding. It is interspersed with numerous stomata, the two guard cells of which contain some chloroplasts. Long multicellular trichomes were present on both the surfaces.




Cu-cuticle; Tr-trichome; Up E-upper epidermis; Pp-palisade parenchyma; Sc-sclerenchyma; Vb-vascular bundle; St-stomata; Spp- spongy parenchyma; Lo E-lower epidermis

**Powder Analysis**

**Organoleptic Characters Of Dried Powder:** Organoleptic characters like color, odor and taste are recorded as shown in Table.1.

**Table 1: Organoleptic characters of leaf powder of *Prosopis cineraria* (L.) Druce**

| Sr. no. | Character | Observation |
|---|---|---|
| 1. | Color | Light green |
| 2. | Texture | Fine |
| 3. | Taste | Astringent |
| 4. | Smell | Odorless |

**Dried Powder Microscopy:** Diagnostic characters of leaf powder like stomata from epidermis, simple trichomes of epidermis, parenchyma cells, aggregates of crystals of calcium carbonate, called as cystoliths, lignified fibers, dark bluish greenish black tannin fragments, protein contained cells, starch grains, aleurone grains. [Fig.2-10].

**Table 2: Microscopic characters of leaves powder in different test reagent**[13]

| | Test reagent | Observation | Characteristics | Component |
|---|---|---|---|---|
| 1. | Ethanol | Red | Aleurone grains consists of amorphous mass of protein | Aleurone grains |
| 2. | Ferric chloride | Bluish or greenish black | Non-nitrogenous, phenolic compounds of high molecular weight. | Tannin containing cell |
| 3. | Phloroglucinol | Deep purplish red | Hard, permeable to water. Lignified tissues provide mechanical rigidity of plant body | Lignified fiber, trichomes |
| 4. | Iodine | Blue or purple | It is fibrous material of cell wall and together with lignin responsible for structural rigidity of plant. | Starch grains or cellulose content |
| 5. | Saffranine | Pink | Hard, permeable to water. Lignified tissues provide mechanical rigidity of plant body | Lignified cells |
| 6. | Millon's reagent | Brick red | Nitrogenous complex compound | Protein content |
| 7. | Sulphuric acid | Dissolves with effervescence | Aggregates of crystals of calcium carbonate, called as cystoliths. | Calcium carbonate |
| 8. | Water | Colorless cellular structure | Epidermal structure having two identical guard cells, forming a pore in center. | Stomata |

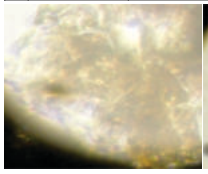


**Fig.2**-Alleuron grains

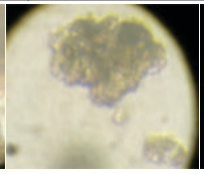


**Fig.3-**Tannin

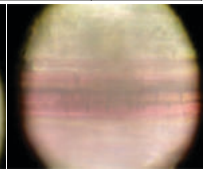


**Fig.4-**Lignified fiber

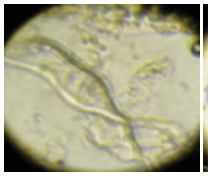


**Fig.5-**Multicelluler trichome

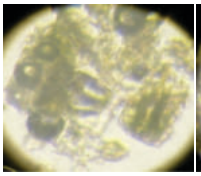


**Fig.6**-Starch grains

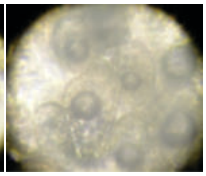


**Fig.7**-Parenchyma cell

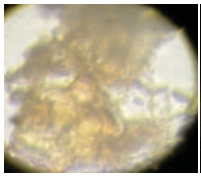


**Fig.8-**Protein

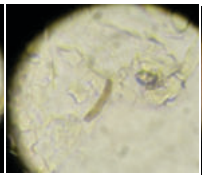


**Fig.9-** Stomata

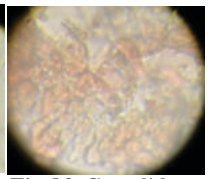


**Fig.10-** Cystolith

## CONCLUSION:

Pharmacognostical evaluation of *Prosopis cineraria* (L.) Druce leaves provided specific parameters that will be useful in scientific evaluation, identification and authentication of the drug.

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