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Taxonomy and economic importance of *Clerodendrum phlomidis* L.f. in Rajasthan

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Abstract- *Clerodendrum phlomidis* L.f. (Verbenaceae) is important desert plant. There are three species in the genus *Clerodendrum* namely *C. aculeatum* (L.) Griseb, *C. indicum* (L.) Kuntze and *C. phlomidis* L.f. *C. phlomidis* L.f. plays a beneficial role in the treatment of many ailments and in ecological as well as medicinal area. The plant is employed in ethnomedicine, veterinary care, fodder for pet animals, ecological significance as a soil binder, local fuel and the preservation of grains against worms and fungal diseases.

Key words: *Clerodendrum phlomidis*, Ethnomedicine, Rajasthan, Soil binder

INTRODUCTION

Taxonomy deals with nomenclature, classification and identification of plant. *Clerodendrum* belongs to family Verbenaceae under the Lamiales order. Verbenaceae is identified as an aromatic family with serrate and opposite leaves.

Clerodendrum phlomidis L.f. commonly known by Arna, Arni or Kakad. It is important shrub of desertic areas in Rajasthan. Species is commonly occurred in Sikar, Jhunjhunu, Churu, Barmer and Jodhpur. It is mainly used as fodder for camel, goat etc. and local fuel. Besides this *C. phlomidis* have medicinal properties like analgesic, anti-microbial etc. as well as some ecological significance like soil binder, local fuel and walls of "Jhopdas" (Huts) for aeration or retain moisture.

Rajasthan is located in the Northwest of India with a geographical area of 3,42,239 sq. km. Between 23°3' and 30°12' North latitude and 69°30' to 78°17' East longitude, the state expands. The Aravalli ranges stretch from North-East to South-West divides the state approximately into two major regions; one is the North-Western arid plain and the second is the Eastern semi-arid plain and the South-Eastern plateau regions, which are radically different in terms of geologic structure. Physiographically, the state is separated into 4 plains. The western desert: with barren hills, rocky plains and sandy plains, the Aravalli hills: stretch South-west to North-east starting from Gujarat and ending in Delhi, the eastern plains: with rich alluvial soils and the South-eastern plateau (Fig-1).

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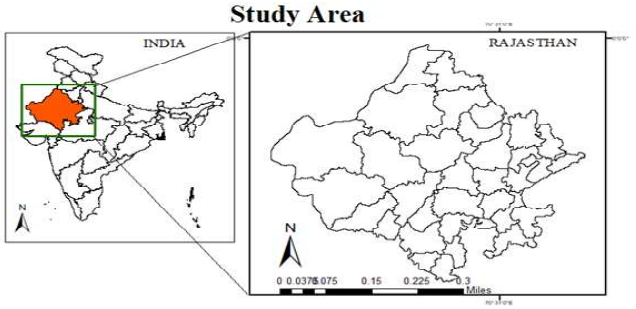

Fig. 1- Study Area

MATERIALS & METHODS

Extensive field surveys of the study area were conducted between 2019– 2022. Field work was carried out throughout the year. Prepare a list of plant species with date wise, occurring in different seasons especially in rainy and winter. Focus has been made on wild and cultivated area of Sikar, Churu and Jhunjhunu district. All the collected specimens were identified with the help of Flora of Rajasthan[1] and Flora of the Indian Desert[2]. Field notes eg. Date, Locality, Habit and Habitat of the plant have been recorded along with ecological as well Ethnoveterinary and Ethnomedicinal significance with the help of local people. The Specimens examined by the herbarium, Department of Botany, University of Rajasthan, Jaipur (India).

OBSERVATIONS

In Rajasthan, there are 3 species of *Clerodendrum* L., reported as a wild, namely *C. aculeatum* (L.) Griseb, *C. indicum* (L.) Kuntze and *C. phlomidis* L.f**.** Species are identified mainly by vegetative characters of stem and leaf. *C. phlomidis* is unique feature i.e. opposite leaf with corolla-tube (more than 2 cm long).

1’ Plants armed……*C. aculeatum*

1’ Plants unarmed:

2 Stem fistular. Leaves verticillate, sessile. Corolla-tube upto 1 cm long……..*C. indicum*

2’ Stem solid. Leaves opposite, petiolate. Corolla-tube more than 2 cm long…….*C. phlomidis*

Nomenclatural Status

Clerodendrum phlomidis L.f. Suppl. 292. 1781; Wight, Ic. 4(3): t. 1473. 1849; Clarke in Hook f. Fl. Brit. India 4: 590. 1885; Duthie, Fl. Gangetic Plain 2: 225. 1911. *Volkameria multiflora* Burm**.**f. Fl. Indica 137 1768. *Clerodendrum phlomidis* var. *rubrum* Roxb. ex Voigt Hort. Suburb. Calcutt. 465. 1845. *Clerodendrum multiflorum* (Burm.f.) Kuntze Revis. Gen. Pl. 2: 526. 1891**.** *Clerodendrum phlomidis* f. *rubrum* (Roxb. ex. Voigt) Moldenke Phytologia 22: 6. 1971.

Botanical Description

Plant erects with subscandent branches, 1-3 m tall. Stems and branches whitish pubescent. Leaves petiolate, 1-8 × 1-6 cm, rhomboid-ovate, acute apex, base truncate to acute, margin coarsely serrate or subentireor undulate, glabrescent. Flowers white or creamish-white or pinkish, dichasial cyme inflorescence.

Fig. 2- a. Plant Habit and **b.** Flowers

Calyx-lobes 1-2 cm long, acute, with few, sessile glands outside. Corolla-tube upto 3.5 cm long, much exserted; lobes 5, sub-equal, obtuse or acute. Drupes 0.5-1.25 cm long, obovoid, 4-lobed, glabrous, blackish-brown, with persistent calyx. Seeds 5-7 mm long, oblong dirty white (Fig- 2).

Flowering and fruiting period is August-March.

Distribution

C. phlomidis is distributed throughout the desertic habitat. In Sikar district the plant observed from agricultural field boundaries and sand dunes.

Economic importance

Fodder and local fuel

Plant leaves are used as a source of fodder for grazing pet animals. Fodder is especially used for goats and camels. People also use the plant roots and stem for local fuel.

Ecological uses

The plant important role plays in sand dune stabilizer. Soil erosion prevents by spreading roots and densely branching pattern used as a barrier for wind flow. Commonly found well grown in hedge along the agricultural field boundaries which protects farm crops from outer side grazing animals. It is used as a wall material in “Jhopdas” (Hut) for aeration.

Ethnoveterinary

The plant leaves used to control worms and digestive issues in cattle Leaves juice also used to kill lice on the body of domestic animals.

Ethnomedicinal uses

Plants roots used in curing various human diseases and health problems such as digestive disorders, piles, constipation, swelling of the body.

DISCUSSION

The genus *Clerodendrum* identified by Carl Linnaeus in the book Species Plantarum (1753). *Clerodendrum phlomidis* was first named by Carl Linnaeus in 1781. Wight (1849), Clarke (1885) and Duthie (1911) revealed similar opinion. Previously same plant described by Burman, Nicolaas Laurens under the name of *Volkameria multiflora* in 1768. *Clerodendrum phlomidis* f. *rubrum* name given by Moldenke in 1971.

C. phlomidis is observed in sandy to rocky wasteland habitats. It is found well grown in hedge along the boundaries of cultivated fields.[1] Verbenaceae is identified by- Plants aromatic, leaves opposite, serrate, stem often angular, non-glandular hairs if present unicellular, flowers zygomorphic, in racemes, spikes or heads, pollen exine thickened near apertures, style simple with bilobed stigma, stigmatic area conspicuously swollen and glandular, ovary with four ovules, ovules attached to the margin of false septa.[3] *Clerodendrum* possess simple leaf, cymose inflorescence, stamens didynamous, exserted and inserted with corolla-tube.[1]

Plant is distributed across India's arid regions.[4] The plant distribution in Rajasthan has already been documented in the following districts: Jaipur, Ajmer, Barmer, Banswara, Jhalawar, Jodhpur and Pali. According to our survey observation, the plant is present in some districts i.e. Sikar, Jhunjhunu, Churu, Barmer and Jodhpur.

C. phlomidis has achieved wide acceptance for its significance against many disorders. *C. phlomiodis* finds a lot of applications in Indian veterinary practices. The plant is used similarly by local people and traditional communities in other parts of the country. The traditional knowledge of the above plant species to cure a particular ailment of livestock is confined to primitive people and passes from one generation to another. The plant has great economic importance for various purposes including ethnomedicinal to treat various human diseases, ethnoveterinary use to treat animal diseases and pesticidal uses like fungicidal and nematicidal. The plant is used for cattle for diarrhoea and worms or when the stomach swells.[5] Leaves are used to kill lice on the body of domestic animals, Foot and mouth diseases and Skin problems.[6] Plants are used in curing many diseases and health problems such as digestive disorders, acidity, gas, diarrhoea, laxative, liver tonic and general health tonic. Roots are used for inflammation, swelling, jaundice, piles, constipation, slowness of digestion, swelling of the body, painful discharge of urine and urinary disease.[7] Leaves used for stomach pain, dyspepsia, digestive disorders, lung diseases, rheumatism, inflammatory diseases, swellings, locally tied for the treatment of guinea worms[8,9] and anti-obesity[10].

C. phlomidis is mentioned in the application of various tree disorders. The whole plant used as a pesticide. Leaf extracts are used for preserving grains[11], protecting from fungal infections[12] and controlling green worms[13]. Additionally, the plant is also used for local fuel needs and fodder primarily for camel and goats. It is best impacts on soil binder, huts wall formation for aeration. In present conditions the depletion of the plant population by the removal of farm boundaries and overgrazing by animals.

CONCLUSION

Family Verbenaceae is occupied by 10 genera in Rajasthan. The *Clerodendrum* L. has observed 3 species including *C. aculeatum* (L.) Griseb*, C. indicum* (L.) Kuntze and *C. phlomidis* L.f. *C. phlomidis* is desertic wild shrub. It is located in sand dunes and agricultural field boundaries. Plant has useful for ecological importance as well as medicinal properties.

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