MONOGRAPH
ON
PADRI TREE
(*RADERMACHERA XYLOCARPA* ROXB. K.SCHUM. SYN. *S TEREOSPERMUM XYLOCARPUM BENTH. & HOOK.F.*)

FOREST BOTANY DIVISION
STATE FOREST RESEARCH INSTITUTE
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FOREWORD

The *Radermachera xylocarpa* is a rare and large sized tree up to 20m in height and 3m in girth, found through out the Deccan Peninsula up to an altitude of 1500m, extending in to parts of Gujarat, Madhya Pradesh, Chhattisgarh Bihar and Orissa. It is a light demander. The tree is commonly known as Padar and *Garudphal*.

It is a multipurpose tree species used as timber, fuel wood, fruit, medicinal, and religious purposes. Its wood is of medicinal value. The plant is credited with antiseptic properties, and resin extracted from the wood is used for treatment of skin trouble.

This monograph provides useful information on the distribution and habitat, morphology, flowering and fruiting, natural regeneration, artificial regeneration, pests and pathogens, utilization, chemical constitution, threat status, conservation measures etc ., of this species for promoting their conservation and for the benefit of interested medicinal practitioners and overall development of forestry, environment and medicinal plant sectors.

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(C.P. Rai, IFS)
Director

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PADRI TREE

(*RADERMACHERA XYLOCARPA* ROXB. K.SCHUM. SYN. *STEREOSPERMUM XYLOCARPUM BENTH. & HOOK.F.*)

I. KNOWING THE SPECIES

Synonymous name: Stereospermum xylocarpum Benth. & Hook.f.

Regional names:

Marathi :	Kharsing , Kadashing, Bairsinge
Telgu :	Nagadudilam, Warawaili,
Tamil :	Vadencarni, Vedanguruni, Mulaiutbi
Kannada :	Pathiri Koonanakoombumura
Malayalam:	Vedangkonna, Edangkorna
Oriya :	Khonda-partoli
Hindi :	Padar ,Padri , Garud

II. DISTRIBUTION AND HABITAT

A large genus of trees distributed in Indo-Malaysian region. Three species occur in India. The *Radermachera xylocarpa* is a rare and large sized tree up to 20m in height and 3m in girth, found through out the Deccan Peninsula up to an altitude of 1500m, extending in to parts of Gujarat, Madhya Pradesh, Chhattisgarh Bihar and Orissa. The tree occurs usually in hilly habitat of deciduous forests. In Madhya Pradesh it occurs on rocky hill slopes at Hoshangabad, Pachmari, Amarkantak, Balaghat, Chhindwara, Seoni and Mandla. In Chhattisgarh, it is distributed in Bilaspur, Raigarh and Jagdalpur. It is a light demander. The tree is commonly known as *Padar* and Garudphal.

III. MORPHOLOGY

Genus

A genus of tree with bipinnately or tri-pinnately compound leaves, petioles and leaflets articulate, leaflets minutely glandular dotted beneath. Flowers terminal, bracts and bracteoles inconspicuous. Calyx closed in bud, splitting spathaceously, truncate or irregularly lobed. Corolla hypocrateriform, infundibuliform or basal tube suddenly widened into an upper tube, lobes unequal. Stamens 4, dibynamous, filaments inserted at the apex of basal tube, hary at base; anther cells V – shaped, divergent. Staminode 1. Ovary elongate, glabrous or tuberculate, 2- locular, style filifrom, stigma 2- lamellate. Disk slightly ridged. Fruit a capsule, linear, sub cylindrical, septum terete, spongy. Seeds many, flat with hyaline wings at both ends.

Species

A moderate to large sized deciduous tree having grayish bark, fairly smooth, flaky. Wood hard, tough, and elastic with a small orange brown heartwood. Leaves bi-pinnate or tri-pinnate , 50-80cm long, leaflets 2-4 pairs with an odd one, elliptic-oblong or ovate, 5-10 x 3-5cm, acute or acuminate at apex, entire or coarsely serrate, glabrous, green leaflets. Flowers in ovoid, erect, tomentose panicles, large , fragrant. Calyx campanulate, 1cm long, pubescent outside, lobes 3-5, irregular. Corolla white with yellow tinge 3cm, long, glabrous. Disk copular, fleshy. Capsule 1m long, woody, slightly curved, tuberculate with winged seeds in it.

IV. SILVICS

The tree is leafless for a short time in the hot season. The large fragrant white or pinkish flowers appear in April – May and the pod (capsules) ripens in next hot season. The capsules are conspicuous from their large size, sometimes as much as 1m in length, woody and tubercled, with a central septum about 1.2cm thick. The winged seeds are about 3.2cm broad.

It is a light demander, though; it stands some shade in early age. It

produces root suckers. It is moderately resistant to fire and grazing. The mean annual girth increment is reported to be 1.8cm.

V. NATURAL REGENERATION

Natural regeneration occurs in rainy season. Natural reproduction occurs through seeds and root suckers. It is often abundant on hill sites. The seedlings are frost hardy and moderately prone to browsing and fire.

VI. ARTIFICIAL REGENERATION

The seeds are used for propagation. The seed develops from a fertilized ovule and comprises an embryo and food reserve contained in a protective coat or testa. There are various methods for raising seedling. Seeds can be directly sown into the field or in nursery beds or in bags and transplanting is done after maturity. Before sowing seeds, seed treatment is given to protect them from disease. Fresh seeds are sown in April – May. It prefers light sandy soil. The seed germination begins after 2-3 weeks of sowing. One year old seedlings are suitable for planting in the field. The pit size of $45cm^3$ is suitable for planting. Pits are to be dug during May-June at a distance of 4m spacing and should be left for 15 – 20 days exposed to sun light. Each pit should be filled with surface soil mixed with 10kg farmyard manure. Irrigation should be given during summer at 7 days interval till the plants have fully established. After the monsoon during winter season (October – December), 25 -30 liter water per day should be given.

VII. PEST AND PATHOGENS OF PLANT

There is no information available on diseases and pests of this plant from India. However, the fungus *Corynespora cassiicola* (Berk. & Curt.) Wei which is a pathogen, endophyte, and saprophyte, has been reported as endophyte in this tree from locations in American Samoa, Brazil, Malaysia, Micronesia, and Florida, Mississippi, and Tennessee within the United States.

VIII. UTILIZATION

The tall growing multipurpose tree is mainly grown in gardens as ornamental and as a source of timber obtained from it. Different uses of this species are given below:

1. Use as timber, poles

The wood is used for house building, furniture, carts and carriages, and for agricultural implements, paneling, packing cases and sleepers.

2. Use as fuel wood

It is a good fuel wood, calorific value: sapwood-5175 cal, 9315 Btu, heart wood 5.449 cal, 9809 Btu

3. Use as fruit

Tender fruits are reported to be eaten as vegetable.

4. Use as medicine

Its wood is of medicinal value. The plant is credited with astringent, antiseptic properties. A decoction of the resin can be used as a remedy against skin diseases. The chemical constituents of plant are reported to have bitter, astringent, diuretic, cordio-tonic and cooling properties. The fruits are used in cough and blood diseases.

5. Religious/Medicinal use:

Its pods are of religious importance to keep away the snakes from the house. The infusion of seed is given internally in snake bite

IX. CHEMICAL CONSTITUENTS

Its leaves contain Dinatin-7- glucuronide acetytolaenic acid, and root contains Stigmasterol and Radermachol. The stem bark of the plant has two important chemical contents viz., Lapachol and alpha – lapachone. They have antibacterial activity against *Staphylococcus aureus, Salmonella typhi* and *antifungal activity* against *Candida albicans, Trychophyton rubrum* and *Trichophyton mentagrophytes.*

X. IMPORTANT FORMULATIONS

The chemical ingredients are used in formulation of ayurvedic drugs viz., Dasmularistam, Dhvanterum tailam, Cyavanaprasam, Agastyarasayanem.

XI. THREAT STATUS AND CONSERVATION MEASURES

It is a rare and threatened species. *Ex-situ* conservation and introduction in botanic gardens and suitable natural habitats is the only measure to enhance its population density.

XII.SOURCE INSTITUTIONS FOR DETAILED INFORMATION

1. State Forest Research Institute, Polipathar, Jabalpur 482008 (M.P.)
2. Botanical Survey of India, Central Circle 10 Chatham Lines, Allahabad 211002 (UP)
3. Forest Research Institute, PO – New Forest, Dehradun (Uttaranchal)
4. University of Kerala, Peechi.
5. University of Calicut.
6. National Botanical Research Institute, Lucknow.

7. Central Drug Research Institute, Lucknow.
8. Central Institute of Medicinal and Aromatic Plants, Lucknow.
9. Indian Institute of Science, 15 Madam Cama Road, Mumbai, 400032, India.
10. University of Florida

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