

**MONOGRAPH
ON
GUGGAL
(*COMMIPHORA WIGHTII* (ARN.) BHANDARI)**



**FOREST BOTANY DIVISION
STATE FOREST RESEARCH INSTITUTE
JABALPUR (M.P.)**

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(*COMMIPHORA WIGHTII* (ARN.) BHANDARI)

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FOREWORD

Commiphora wightii is a flowering plant in the family Burseraceae. It is commonly known as Guggul and is most common in northern India, Karnataka, Rajasthan, Deccan and Gujarat. It prefers arid and semi-arid climates and is tolerant of poor soil. It is a shrub or small tree.

This is medicinal and prioritized herb species for conservation in the botanical garden (as per BSI guidelines). Guggul (aka guggulu) is a gum resin, historically used for its antiseptic and deep penetrating actions in the treatment of elevated blood cholesterol and arthritis. Guggul is effective as a weight-loss and fat burning agent. It increases white blood cell counts and possesses strong disinfecting properties.

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

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(C.P. Rai, IFS)
Director

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GUGGAL

(*COMMIPHORA WIGHTII* (ARN.) BHANDARI)

I. KNOWING THE SPECIES

A genus of about 165 species of spiny, balsami - ferous trees and shrubs distributed in Africa and tropical Asia. Many of the species yield resin of commercial importance. About 5 species occur in India of which *Commiphora wightii* yield Indian Bdellium.

Regional names:

| | |
|-------------------|--------------------------------|
| English: | Indian Bedellium |
| Telgu: | Guggal |
| Tamil: | Maishakshi, Gukkal |
| Kannada: | Guggal |
| Malayalam: | Gulgulu, Guggalu |
| Hindi: | Guggal, Guggulu |
| Gujarati: | Indian Gugguru |
| Marathi: | Guggala |
| Sanskrit: | Guggulu, Koushikaha, Devadhupa |

II. DISTRIBUTION AND HABITAT

Commiphora wightii is a flowering plant in the family Burseraceae. The guggul plant may be found from northern Africa to central Asia, but is most common in northern India and Karnataka, Rajasthan, Deccan, Gujarat and Madhya Pradesh. In Madhya

Pradesh, it is distributed naturally in ravine areas of Chambal especially in Morena, Sheopur, Shivpuri and Bhind districts. It prefers arid and semi-arid climates and is tolerant of poor soil. It is a shrub or small tree. The Guggul plant prefers arid and semi-arid climates and is tolerant of poor soil.

III. MORPHOLOGY

A small tree or shrub with spinescent branches. It is perennial and slow growing species. The height of the plant appears between 1.5 and 2.5 m. The leaves are smooth and glabrous. The ash colored bark comes off in rough flakes exposing the under bark which also peels off in thin papery rolls. The leaf fall occurs during May. The new leaves are violet in color. The flowers are small and pink in color. There are two colors viz., black and white are reported in the seeds, of which black color seeds are more fertile.

IV. NATURAL REGENERATION

Natural regeneration occurs through seeds in its natural habitats and is very scanty in distribution.

V. ARTIFICIAL REGENERATION

The plant can be raised from seeds and stem cuttings of old branches. The soft woody stem cuttings of one meter length and 10 mm thickness should be collected in the month of April – May and be planted in nursery beds during June - July. The cuttings initiate sprouting in 10-15 days. The sprouted plants of 10-12 months old are suitable for planting in field during rainy season. The seed origin plants are healthier to resist high wind velocity. Though, the white color seed germination is very poor (5%). The black seeds gave 40%-45% germination. The plants can also be raised through grafting in the months of July – September. The sandy to silt-loam soil are most suitable

for growth. The pit size of 60cm X 60cm X 60cm are optimum for planting. The pits should be treated with insecticides and termite powder before planting. The distance between plant to plant and row to row should be 2m X 2m and 3m X 3m respectively. The plant requires moderate irrigation during summer season.

VI. UTILIZATION

The plants attain normal height and girth after 8-10 years of growth. The gum tapping is carried out between December and March by shallow incision on the bark. The length of incision may be 10-30 cm. Gum tapping can be done 3 to 5 times in the season at 7-15 days interval from the same plant. Traditionally, gum tappers use horse urine, caustic soda, ethaphone as catalyst during gum tapping. They dip the incisor in the chemical catalyst before incision on the bark. Scientifically, the gum resin is also extracted by mixing soft air dried cuttings using solution extraction method. The useful part of the plant is olio gum resin. The gum is bitter, acrid, astringent, thermogenic, aromatic, aphrodisiac, antiseptic, anthelmintic and anti-inflammatory. Traditionally guggul lipid has been used to treat arthritis, rheumatism, haemorrhoids, urinary disorder, obesity, skin diseases and high cholesterol. Guggul (aka guggulu) is a gum resin, historically used for its antiseptic and deep penetrating actions in the treatment of elevated blood cholesterol and arthritis. Guggul is effective as a weight-loss and fat burning agent. Guggul helps maintain healthy fat levels through already normal metabolism. It increases white blood cell counts and possesses strong disinfecting properties. Often used as a carrier and combined with other herbs to treat specific conditions. Guggul with cow's urine is good for oedema. Guggul is often adulterated with the oliogum resin of *Boswellia serrata* or sometimes with resin of *Pinus* species. Besides for oliogum resin, plant is utilized for small fuel wood. It promotes healthy cholesterol levels already within the normal range. It contains resin, volatile oils, gum, fatty acid ester and ketonic substances. Ingredients: 100% Kosher Vcaps, Microcrystalline cellulose, Colloidal silicon dioxide, Magnesium Stearate.

VII. YIELD

Approximately 500-800 gram gums are obtained per plant

VIII. CHEMICAL CONSTITUENTS

Myricyl alcohol and β - sitosterol were isolated. Monocyclic diterpene- α - camphorene and cembrene isolated from resin, allylcembrol, cholesterol, 4, 17 (20) – trans – pregnadin – three, 16- dione, 4,17 (20) – ics – pregandin- 3,16-dione and 3 new sterols guggulsterols 1, 11,111 isolated from gum resin. Cembrene A isolated from resin. An unidentified compound from gum resin exhibited lipid lowering activity.

IX. IMPORTANT FORMULATION

Yogaraja guggulu, Vatari guggulu, Simhanada guggulu, Kaissora guggulu, Mahayogaraja guggulu, Chandraprapha vati.

X. THREAT STATUS AND CONSERVATION MEASURES

It is a medicinal and prioritized shrub species for conservation in the botanical garden (as per BSI guidelines). Data Deficient (IUCN 2.3). The species is threatened in wild due to its over exploitation for medicinal and fuel wood, and its uprooting for expansion of agriculture.

XI. SOURCE INSTITUTIONS FOR DETAILED INFORMATIONS

- National Research Centre for Medicinal and Aromatic Plants, Boriavi, Anand, Gujarat.
- Guggal Herbal Farm Mangliawas CCRAS, Ajmer (Rajasthan) Department of Botany, J.N. Vyas University, Jodhpur- 342001 (Rajasthan).

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- Arid Forest Research Institute, Jodhpur (Rajasthan)
- State Forest Research Institute, Jabalpur (MP)
- Central Institute of Medicinal and Aromatic Plants, Lucknow (UP)
- Central Drug Research Institute, Lucknow (UP)
- Indian Council of Forestry Research and Education, Dehradun (Uttaranchal)
- Tropical Forest Research Institute, Jabalpur (MP)
- National Medicinal Plant Board, New Delhi
- Jawahar Lal Neharu Krishi Viswavidyalaya, Jabalpur

