

DALBERGIA SISSOO DC. - AN IMPORTANT MEDICINAL PLANT**M. Bharath, E. Laxmi Rama Tulasi, K. Sudhakar* and M. Chinna Eswaraiah**

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ABSTRACT

Nature has been a good source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources, many based on their use in traditional medicine. Various medicinal plants have been used for years in daily life to treat diseases all over the world. The present study reveals the medicinal values of *Dalbergia sissoo* DC. (Fabaceae). In this communication, we reviewed the Phytochemistry and its applications in the treatment of various ailments. The genus consists of 300 species among which 25 species occur in India. The generic name Dalbergia honors the Swedish brothers Nils and Carl Dalberg, who lived in the 18th century. The plant is used in treatment of leprosy, jaundice, gonorrhoea and syphilis etc.

Keywords: *Dalbergia sissoo* DC. Fabaceae, Phytochemistry, Jaundice, Leprosy.

INTRODUCTION

Herbal drugs are used in traditional methods of treating the diseases worldwide. Several types of medicinal plants are existing in the nature and are effective in treating different type of diseases.¹ Herbal medicine is a triumph of popular therapeutic diversity. In recent times there has been a tremendous increase in the use of plant based health products in developing as well as developed countries, resulting in an exponential growth of herbal products globally.² The genus consists of 300 species among which 25 species occur in India. Many species of *Dalbergia* are important timber trees, valued for their decorative and often fragrant wood, rich in aromatic oils³. The most famous of these are the rosewoods, so-named because of the smell, but several other valuable woods are yielded by the genus⁴. The generic name Dalbergia honors the Swedish brothers Nils and Carl Dalberg, who lived in the 18th century. The plant is native to India⁵; it is the state tree of Punjab (India). The tree has many reputed medicinal properties and has been used culturally for a variety of ailments. The temperature in its native range averages 10–40 °C (50–104 °F), but varies from just below

freezing to nearly 50 °C (122 °F). It can withstand average annual rainfall of 500 to 2,000 mm (79 in) and droughts of 3–4 months. Soils range from pure sand and gravel to rich alluvium of river banks, sissoo can grow in slightly saline soils. Seedlings are intolerant of shade.⁶



Fig. 1: *Dalbergia sissoo* DC

TAXONOMICAL CLASSIFICATION⁷⁻⁹

Domain: Eukaryota
 Kingdom: Plantae
 Division: Magnoliophyta
 Phylum: Tracheophyta
 Class: Magnoliopsida
 Order: Fabales
 Family: Fabaceae
 Tribe: Dalbergieae
 Genus: *Dalbergia*
 Species: *D. sissoo*
 Binomial name: *Dalbergia sissoo* DC.

SYNONYMS⁴

Amerimnon sissoo (Roxb.) Kuntze
Amerimnon P.Browne
Coroya Pierre
Ecastaphyllum P.Browne
Miscolobium Vogel
Triptolemea Mart.

COMMON NAMES¹⁰⁻¹²

Sanskrit: Shinshapa, aguru
English: Indian Rosewood, Bombay blackwood
Hindi: Shisham ,sissu ,sissai , sisam
Tamil: Sisso, gette
Kannada: Beeti, shista baage, agaru, bindi
Bengali: Shishu
French: Ébénier juane
Arabic: Arabic

BOTANICAL DESCRIPTION

Dalbergia sissoo DC is a medium to large tree of about 25 meters high with grey-yellow trunk, longitudinal crack, and downcast twig. Leaves are leathery, pinnately compound, with about five alternate leaflets. Leaf stalk (petiole) measures about 15 cm long, each leaflet widest at the base, to 6 cm long with a fine pointed tip.



Fig. 2: Trunk



Fig. 3: Compound leaves and immature fruits

Flowers are whitish to pink, fragrant, nearly sessile, up to 1.5 cm (0.59 in) long and in dense clusters 5–10 cm (2.0–3.9 in) in length. Pods are oblong, flat, thin, strap-like 4–8 cm (1.6–3.1 in) long, 1 cm (0.39 in) wide and light brown. They contain 1–5 flat bean-shaped seeds 8–10 mm (0.31–0.39 in) long.



Figure 4: Flowers

They have a long taproot and numerous surface roots which produce suckers. Young shoots are downy and drooping, established stems with light brown to dark grey bark up to 2.5 cm (0.98 in) thick, shed in narrow strips, large upper branches support a spreading crown. The plant has ability to fix nitrogen from the atmosphere through bacteria located in nodules present in the root system. The leaf litter that accumulates and decomposes also contributes to soil fertility by adding additional nitrogen, potassium, iron, manganese, and organic carbon. Propagation is done by seeds and also by root suckers. Various parts of the plant are used as medicines.

FLOWERING PERIOD⁷ : March - May

GEOGRAPHICAL DISTRIBUTION^{11, 13, 14}

Dalbergia sissoo is found in tropical to subtropical climates in natural and planted forests, very widely distributed in Pakistan, India, Afghanistan, Persia, Iraq, Kenya and Tanzania.

TRADITIONAL USES¹⁵

Various parts of *Dalbergia sissoo* are traditionally used in treating different diseases and are mentioned below.

Seeds: Sissoo oil is used to treat blue itching, burning on the skin, and scabies.

Leaves: Finely ground paste of 8-10 leaves of sissoo and 25gm of palm candy taken in the morning alleviates profuse menstruation. 50-100 ml decoction of the leaves taken thrice in a day is useful in Painful micturition and to cure boils and pimples. 10-15 ml juice (leaves) taken thrice in a day helps in eliminating pus in urine and in treating jaundice. The leaves warmed and tied on breast, and consuming the decoction of the leaves removes swelling of the breast.

Bark: 3-6gm powdered bark or decoction of the leaves is helpful in gonorrhoea. Decoction of the bark and leaf is given in leprosy. Make a decoction of 10gm sissoo bark with 500gm of water and it should be boiled till the liquid reduces to half. Mix the juice of the bark and consume for forty days every morning which helps in leprosy.

Sissoo nectar: Take 20gm of Sissoo nectar, 320gm water, and 160 gm milk. Boil it till only milk remains. Consume 3 times a day. This milk cures any type of fever.

CHEMICAL CONSTITUENTS¹⁶

Leaves: Isoflavone-O-glycoside.

Flowers: Biochenin A, tectorigenin, 7, 4 dimethyle tectorigenin and 7-O- methyle tectorigenin.

Green pods: Mesoinisitol, 7-O- methyle tectorigenin and 4'-rhamnoglucoside.

Mature pods: Isocaviumin, tectorigenin, dalbergin, caviuinin and tannins.

Stem bark: Dalberginone, dalbergin, methyl dalbergin and dalbergichromene.

Heartwood: Dalbergin, nordalberginones, dalbergichromene, fixid oil and essential oils.

USES^{17, 18, 19}

Ayurveda: Leaf juice for eye ailments, considering the wood and bark as abortifacient, anthelmintic, antipyretic, aphrodisiac, expectorant, and refrigerant. The wood and bark for anal disorders, blood diseases, burning sensations, dysentery, dyspepsia, leucoderma, and skin ailments.

Yunani: The wood for blood disorders, burning sensations, eye and nose disorders, scabies, scalding urine, stomach problems, and syphilis. The alterative wood is used in India for boils, eruptions, leprosy and nausea.

Different parts such as roots, bark, wood, leaves and seeds are being used as remedy in many diseases including skin diseases, blood diseases, syphilis, stomach problems, dysentery, nausea, eye and nose disorders, aphrodisiac, expectorant. Leaf extract has been used to treat sore throats, heart problems, dysentery, syphilis, and gonorrhoea. In India and Nepal rural people use *Dalbergia sissoo* leaves to treat animals suffering from non-specific diarrhoea.

Herbal preparation of *Dalbergia sissoo* and *Datura stramoium* with cow urine can be used as a potent antiseptic preparation for prevention and treatment of chronic bacterial infections. People use twigs of sissoo to clean their teeth, root is astringent.

RECENT DEVELOPMENTS IN THE RESEARCH AREA OF DALBERGIA SISSOO

Mohammad Asif et al conducted a study in 2009, Anti-inflammatory activity of ethanolic extract of *Dalbergia sissoo* (Roxb.) bark. It can be concluded that the ethanolic extract of *Dalbergia sissoo* bark at 1000 mg/kg showed the most potent anti-inflammatory activity compared to the other groups (300 and 500 mg/kg) throughout the observation period.²⁰

Mohammad Asif et al conducted a study in 2011, phytochemical investigation and evaluation of anti-nociceptive activity of ethanolic extract of *Dalbergia sissoo* (Roxb.) bark. They concluded that (300, 500 and 1000 mg/kg) doses of extract exhibited significant and dose dependent anti-nociceptive activity which may be due to presence of flavanoids.²¹

Harsha Kharkwal et al conducted a study in 2012, Anti-termite activity of heartwood of *Dalbergia sissoo* Roxb. Ex.Dc. It concluded that the plant extracts can be used as an alternative for synthetic pesticides for termite control in buildings.²²

Pankaj singh niranjan et al conducted a study in 2010; Anti-diabetic activity of ethanolic extract of *Dalbergia sissoo* L. leaves in alloxan induced diabetic rats. They concluded that the ethanolic extract of the *Dalbergia sissoo* leaves are 12% more effective in reducing the BGL compared to standard Glibenclamide.²³

Jaspreet Kaur Sidana et al conducted a study in 2012, Analgesic and anti-inflammatory activities of *Dalbergia sissoo* leaves extract. They concluded that the extract possesses both analgesic and anti-inflammatory properties.²⁴

Mallinath H. Hugar et al conducted a study in 2010, phytochemical and pharmacological

studies of ethanol extract of *Dalbergia sissoo* seeds. An approach for the *in-vivo* analgesic and antipyretic activities. It concluded that *Dalbergia sissoo* seeds extract has moderate analgesic and remarkable antipyretic activities.²⁵

Nitinkumar Upwar et al conducted a study in 2011, Evaluation of anti-helminthic activity of *Dalbergia sissoo* Roxb. The study indicated the potential usefulness of *Dalbergia sissoo* Roxb. against helminthic infections.²⁶

Neeraj S. Vyawahare et al Conducted a study in 2012, Anti-diabetic Evaluation of *Dalbergia sissoo* against alloxan induced diabetes mellitus in wistar albino rats. They concluded that ethanolic extract of *Dalbergia sissoo* bark possesses significant anti-diabetic activity.²⁷

Arvinder Kaur et al conducted a study in 2011, Evaluation of antioxidant potential of stem bark extract of *Dalbergia sissoo*. Finally results

shown, among the different extracts of stem bark of the plant *Dalbergia sissoo*, chloroform extract possesses marked antioxidant activity, whereas methanolic extract shown moderate activity in different *in vitro* anti-oxidant assays.²⁸

Shazia Sultana et al conducted a survey on, Indigenous knowledge of folk herbal medicines by the women of district Chakwal, Pakistan. This survey describes that, crush the leaves and boiled in water and the filtrate obtained is used to wash hair for removing dandruff and for long hair.²⁹

S Chandra et al conducted a study on Anti-inflammatory activity of *Dalbergia sissoo* leaves. They concluded that the *D. sissoo* leaf extract possessed significant anti-inflammatory activity (in acute, sub-acute and chronic models of inflammation) without any side effects on gastric mucosa.³⁰

LIST OF SPECIES OF IN DALBERGIA GENUS^{7, 31}

1	(Rosewood) <i>D. abrahamii</i>	26	(Bombay Blackwood) <i>D. latifolia</i>
2	(Burmese Rosewood) <i>D. bariensis</i>	27	(Bois de Rose) <i>D. maritima</i>
3	(Palisander) <i>D. baronii</i>	28	(African Blackwood) <i>D. melanoxylon</i>
4	(Caroba-Brava) <i>D. brasiliensis</i>	29	(Canela-De-Burro) <i>D. miscolobium</i>
5	(Brown's Indian Rosewood) <i>D. brownei</i>	30	(Rosewood) <i>D. mollis</i>
6	(Granadillo) <i>D. calycina</i>	31	(Bejuco De Peseta) <i>D. monetaria</i>
7	(Dalbergia) <i>D. candanensis</i>	32	(Bahia Rosewood) <i>D. nigra</i>
8	(Jacarand) <i>D. catingicola</i>	33	(Fragrant Rosewood) <i>D. odorifera</i>
9	(Brazilian Kingwood) <i>D. cearensis</i>	34	(Burma Rosewood) <i>D. oliveri</i>
10	(Rose Wood) <i>D. cochinchinensis</i>	35	(Dalbergia) <i>D. palauensis</i>
11	(Granadillo) <i>D. cubilquitzensis</i>	36	(Dalbergia) <i>D. palauensis</i>
12	(Burma Blackwood) <i>D. cultrata</i>	37	(Akar Laka) <i>D. parviflora</i>
13	(Burma Blackwood) <i>D. cultrata</i> var. <i>cultrata</i>	38	(Nambar) <i>D. retusa</i> var. <i>retusa</i>
14	(Bastiao-De-Arruda) <i>D. decipularis</i>	39	(Rabo-De-Guariba) <i>D. riparia</i>
15	(Bejuco De Peseta) <i>D. ecastaphyllum</i>	40	(Malabar Blackwood) <i>D. sissoides</i>
16	(Mussuta) <i>D. elegans</i>	41	(Indian Rosewood) <i>D. sissoo</i>
17	(Jacarand -Rosa) <i>D. foliolosa</i>	42	(Sabuarana) <i>D. spruceana</i>
18	(Jacarandá-Rosa) <i>D. frutescens</i>	43	(Rosewood) <i>D. stevensonii</i>
19	(Pau-De-Estribos) <i>D. frutescens</i> var. <i>frutescens</i>	44	(Ver'nica) <i>D. subcymosa</i>
20	(Jacarand -Rosa) <i>D. frutescens</i> var. <i>tomentosa</i>	45	(Rosewood) <i>D. trichocarpa</i>
21	(Ebano) <i>D. funera</i>	46	(Dalbergia) <i>D. tucurensis</i>
22	(Tripa-De-Galinha) <i>D. gracilis</i>	47	(Heliotropio) <i>D. villosa</i>
23	(Sebastiao-De-Arruda) <i>D. hortensis</i>	48	(Heliotropio) <i>D. villosa</i> var. <i>barretoana</i>
24	(Jacaranda) <i>D. inundata</i>	49	(Rosewood) <i>D. xerophila</i>
25	(Shisham) <i>D. lanceolaria</i>	50	(Yucatan Rosewood) <i>D. yucatanensis</i>

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