ABSTRACT: In traditional medicinal trees, Dalbergia sissoo is a popular species around the world. It has been used for therapeutic purpose from thousands of years and now there is a growing demand for plant based medicines, health products, pharmaceuticals and cosmetics. Dalbergia sissoo is a widely growing plant which is used traditionally as anti-inflammatory, antipyretic, analgesic, anti-oxidant, anti-diabetic and as antimicrobial agent. Several chemical constituents have been isolated and identified from different parts of the plant belonging to the category of alkaloids, glycosides, flavanols, tannins, saponins, sterols and terpenoids. Compounds isolated from Dalbergia sissoo like an isoflavone, biochanin is a potent chemotherapeutic cancer preventive agent with a distinct estrogenic activity. Dalbergia sissoo possesses several pharmacological activities however, it is essential that more clinical and pharmacological studies should be conducted to investigate the unexploited potential of this plant. A review of plant description, phytochemical constituents present, traditional uses and pharmacological activities of Dalbergia sissoo are given in the present article.

INTRODUCTION: Dalbergia sissoo, commonly known as Indian Rosewood, is a deciduous tree, also known as sisu, sheesham, tahli and Tali. It is native to the Indian Subcontinent and Southern Iran. Dalbergia sissoo is the state tree of Punjab state (India) and the provincial tree of Punjab province (Pakistan). It is found growing along river banks below 900 metres (3,000 ft) elevation, but can range naturally up to 1,300 m (4,300 ft). It can withstand average annual rainfall up to 2,000 millimetres (79 in) and droughts of 3–4 months. It prefers soils from pure sand and gravel to rich alluvium of river banks. Shisham can grow in slightly saline soils. Seedlings are intolerant of shade.

Taxonomical Classification:
- Kingdom: Plantae
- Division: Magnoliophyta
- Phylum: Tracheophyta
- Class: Magnoliopsida
- Order: Fabales
- Family: Fabaceae
- Genus: Dalbergia
- Species: D. sissoo
Binomial name: *Dalbergia sissoo* DC.

Synonyms:

Common names:
Sanskrit (Shishapa, aguru), English (Indian Rosewood, Bombay blackwood), Hindi (Shisham, sissu, sisam), Tamil (Sisso, gette), Bengali (Shishu), French (Ébenier juane), Arabic (Arabic) 3.

Botanical Description:
*Dalbergia sissoo* is a medium to large size deciduous tree. It is of about 25 meters high with grey-yellow trunk, longitudinal crack, and downcast twig. Leaves are leathery, pinnately compound, alternate leaflets, petiolated leaf stalk, measures about 15 cm long, each leaflet widest at the base, to 6 cm long with a fine pointed tip. Flowers are whitish to pink, fragrant, nearly sessile, and in dense clusters. Pods are oblong, flat, thin, strap-like 4–8 cm long, 1 cm wide and light brown (Fig. 1 and 2). They contain 1–5 flat bean-shaped seeds 8–10 mm long. It has a long taproot and numerous surface roots which produce suckers. Young shoots are downy and drooping, stems have 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 (Fig. 1 and 2) 1.

Geographical Distribution:
*Dalbergia sissoo* is found in tropical to subtropical climates in natural and planted forests, very widely distributed in Pakistan, India, Bangladesh, Israel, Afghanistan, Persia, Iraq, Kenya, US and Tanzania 4.

Phytochemical Constituents:
Isoflavone-Ö-glycoside, Biochenin A, tectorigenin, 7, 4 dimethyle tectorigenin and 7-O- methyle tectorigenin, Mesoinisitol, 7-O- methyle tectorigenin and 4’-rhamnoglucoside, Isocaviunin, tectorigenin, dalbergin, caviunin and tannins, Dalberginone, dalbergin, dalberginone, dalbergichromene, Dalbergin, nordalberginones, dalbergichromene, fixid oil and essential oils. Compounds isolated from *Dalbergia sissoo* like an isoflavone, biochanin is a potent chemotherapeutic cancer preventive agent with a distinct estrogenic activity. Two rare glycosides kaempferol and quercetin rutinosides are also isolated 5, 6.

Traditional uses:
Its leaf juice is used for eye ailments. Wood and bark act as abortifacient, anthelmintic, antipyretic, aphrodisiac, expectorant, and refrigerant also used in anal disorders, blood diseases, burning sensations, dysentery, dyspepsia, leucoderma, skin ailments, blood disorders, burning sensations, eye and nose disorders, scabies, scalding urine, stomach problems, and syphilis, boils, eruptions, leprosy and nausea.

Leaf extract has been used to treat sore throats, heart problems, dysentery, syphilis, and gonorrhea. In India and Nepal rural people use *Dalbergia*
sissoo leaves to treat animals suffering from non-specific diarrhoea. People use twigs of tree to clean their teeth.

**Reported Pharmacological activities:**

**Anti-inflammatory activity:**
Anti-inflammatory activity of ethanolic extract of *Dalbergia sissoo* bark was evaluated. It can be concluded that the ethanolic extract 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.

**Anti-termite activity:**
Anti-termite activity of heartwood of *Dalbergia sissoo* was evaluated. It was concluded that the plant extracts can be used as an alternative for synthetic pesticides for the control of termite in buildings.

**Anti-diabetic potential:**
Pankaj singh niranjan et al conducted a study in 2010 to evaluate the anti-diabetic activity of ethanolic extract of *Dalbergia sissoo* leaves in alloxan induced diabetic rats. They concluded that the ethanolic extract of the leaves are 12% more effective in reducing the blood glucose level compared to standard Glibenclamide.

**Analgesic and Antipyretic effects:**
Phytochemical, analgesic and antipyretic activities of ethanol extract of *Dalbergia sissoo* seeds were evaluated. It was concluded that *Dalbergia sissoo* seeds extract has moderate analgesic and remarkable antipyretic activities.

**Anti-helminthic potential:**
Anti-helminthic activity of *Dalbergia sissoo* was determined. The study showed the potential usefulness of *Dalbergia sissoo* against helminthic infections.

**Antioxidant potential:**
Stem bark of *Dalbega sissoo* were evaluated for its antioxidant potential. Finally results shown, among the different extracts of stem bark of the plant, chloroform extract exhibited marked antioxidant activity, whereas methanolic extract shown moderate activity in different in vitro anti-oxidant assays.

**Antimicrobial Property:**
In a study, a herbal preparation containing *Dalbergia sissoo* and *Datura stramoium* was evaluated for its antibacterial potential against pathogenic strains of gram positive (*Staphylococcus aureus* and *Streptococcus pneumoniae*) and gram- negative (*Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*) bacteria. Antibacterial effect was compared to standard antibiotic drugs i.e. Chloramphenicol (30 mcg), Ampicillin (10 mcg), Nalidixic acid (10 mcg) and Rifampicin (30 mcg). Extract was found to be most active against both gram-positive as well as gram-negative bacteria. Clinical isolate of *S. aureus* showed higher sensitivity towards both extract than standard strains, and inhibited growth on most regulatory levels such as inhibition of protein, DNA, RNA and peptidoglycan synthesis. The results of the study shows that extract of *Dalbergia sissoo* and *Datura stramoium* may be used as a potent antimicrobial preparation for prevention and treatment of chronic bacterial infections.

**Antinociceptive Activity:**
The antinociceptive activity of ethanolic extract of the plant bark of *Dalbergia sissoo* was evaluated using tail flick method on Wistar rats. Three different dose levels (300, 500, and 1000 mg/kg) in 0.5% carboxyl methyl cellulose were administered. The antinociceptive extract activities of the all doses were compared with that of the standard drug aspirin (300 mg/kg). The results were found to be significant (P < 0.01). At the above doses, the extract possesses significant dose-dependent antinociceptive activity. Phytochemical investigation of the ethanolic extract showed the presence of carbohydrates, proteins, amino acids, phenolic compounds, and flavanoids. The antinociceptive activity of the bark extract may be due to the presence of phytochemical constituents such as flavanoids.

**Osteogenic Activity:**
One new isoflavone glucoside, caviunin 7-O-[β-D-apiofuranosyl-(1→6)-β-D-glucopyranoside] and a new itaconic derivative, (E)-4-methoxy-2-(3,4-dihydroxybenzylidene)-4-oxobutanoic acid along with series of isoflavones and flavonols with their glucosides and a lignan glucoside were isolated.
from the ethanolic extract of Dalbergia sissoo leaves and were assessed for osteogenic activity in primary calvarial osteoblast cultures. Result showed that compounds exhibited significant osteogenic activity. 

CONCLUSION: In recent years, medicinal plant studies has received much attention as this brings to light the numerous little known and unknown medicinal virtues especially of plant origin which needs evaluation on modern scientific lines such as phytochemical analysis, pharmacological screening and clinical trials. Dalbergia sissoo possesses a variety of pharmacological activities as discussed in present review article. However, it is essential that more clinical and pharmacological studies should be conducted to investigate the unexploited potential of this plant.

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REFERENCES:


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