ABSTRACT

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Pongamia pinnata is commonly known as Indian Beech Tree, Honge Tree, or Pongam Tree; it originates from India only. It can produce edible oil like bio-diesel, starch, ethenol, and biogas through the method of fermentation. The Pongamia pinnata is an easy method to generate diesel, and some electrified villages in India have created their own power systems to run the pumps and other machinery. This Pongamia pinnata is most useful in the treatment of various diseases in human beings, which has already been proven. This review has proved the different pharmacological activity like antipyretic, anti-inflammatory, larvicidal, anti-ulcer, antifungal, and hepatoprotective, etc. Alkaloids and fatty acids are present in the higher level constituents of the Pongamia pinnata.

KEYWORDS: Pongamia pinnata, antipyretic, anti-inflammatory, larvicidal, anti-ulcer, antifungal activity.

INTRODUCTION

Pongamia pinnata is an evergreen shrub or tree. The tree height is 15-25 meters with a straight or crooked trunk 50-80 cm or more in diameter and broad crown of spreading or drooping branches. The bark colour is grey-brown, smooth or faintly vertically fissured. The leaves are alternate, imparipinnate with a long slender leafstalk, hairless, pinkish-red when young, glossy appearance dark green above and dull green with prominent veins present. Leaflets 5-9, paired except at end, short-stalked, ovate elliptical or oblong, 5-25 x 2.5-15 cm, obtuse acuminate at apex, rounded at base, not toothed at the edges, slightly thickened. Inflorescence raceme-like, axillary, 6-27 cm long, bearing pairs of strongly fragrant flowers; calyx campanulate, 4-5 mm long, truncate, finely pubescent. Flower clusters at base of and shorter than leaves, to 15 cm long, slender, drooping. In India, seed ripens from February to May.
Pod production starts 5-7 years after sowing. They do not open naturally, and must decay before seeds can germinate.

**Scientific classification**

![Pongamia pinnata](image)

**Fig: 1 Pongamia pinnata**

Kingdom: Plantae (Autotrophic plants, green algae, and red algae which generally acquire nutrients through photosynthesis and display alternation of generation).

Order: Fabales (Flowering plants)

Family: Fabaceae (Or Leguminoseae, legumes that develop nodules which house nitrogen-fixing cyanobacteria. This is the most diverse family in the order fabales)

Genus: Pongamia (Or Indian beech tree)

Species: *P. Pinnata* (Pinnate shaped leaves, the only member of the *Pongamia* genu)

**Vernacular names**

Hindi- karanj, Tamil: Pungai, Malayalam: Ponnu, Unnu, Oriya: Koranjo, Kannada: Honge
Marathi: Karanj, Telugu: Pungu, Gujarati: Karanja, Bengali: Karanj, Assamese: Karchaw
Sanskrit: Karanjah.

**Medicinal value of *Pongamia pinnata***

Flower- bleeding hemorrhoids, or piles, Fruit- abdominal tumors, female genital tract infections, ulcers, and haemorrhoids, Seed extracts can be used to heal the scar tissue tumors, treat high blood pressure, and treat anemia. Powder reduces fever and helps in treating bronchitis and whooping cough, Oil (extracted from seed)- used as an astringent and to kill parasitic worms Helpful in treating whooping cough, piles, liver pain, chronic fever, ulcers,
and leprosy. Relieves sore joints and muscles and arthritis. Used to treat eczema and other skin irritations when mixed with zinc oxide.

*Pongamia pinnata* is a good remedy for many human diseases, it is useful to treat the *mycobacterium leprae*, the bacterium responsible for the disease of leprosy. The root extract of this plant have anti ulcer property caused by *H.pylori*. It is effectively managed the diarrhea particularly caused a strains of *E.coli*. The plant has an anti pyretic activity also mainly the brewer’s yeast or saccharomyces cerevisiae induced pyrexia. Its leaf extract have insecticidal effect like head lice, Antifilarial effect against the *Wuchereria bancrofti*, *Pongamia pinnata* oil is good antifungal property against the organisms like *Aspergillus niger*, *Aspergillus fumigatus*. Antimalarial effects also already proved against the organisms of *Plasmodium falciparum*.

**CONSTITUENTS**

*Pongamia pinnata* tree is reported to contain alkaloids demethoxy-kanugin, gamatay, glabrin, glabrosaponin, kaempferol, kanjone, kanugin, karangin, neoglabin, pinnatin, pongamol, pongapin, quercitin, saponin, b-sitosterol, and tannin. Fatty acid composition: palmitic, 3.7-7.9%, stearic 2.4-8.9, arachidic 2.2-4.7, behenic 4.2-5.3, lignoceric 1.1-3.5, oleic, 44.5-71.3, linoleic 10.8-18.3, and eicosenoic 9.5-12.4%.

**Pharmacological activity in Pongamia pinnata**

**Anti-inflammatory and anti-nociceptive potential activity**

Manoj Kumar Sagar et al[1] evaluated the anti-inflammatory and anti-nociceptive potential of the ethanolic extract of *Pongamia pinnata* stem bark animal models. The antioxidant activity of ethanolic extract of *Pongamia pinnata* and compared with ascorbic acid (Standard) and the analgesic and anti-inflammatory activities in animal models. The extract has an anti-inflammatory effect demonstrated by its inhibitory effects on Carrageenan induced paw edema. The analgesic activity was tested by acetic acid-induced writhing response in albino mice and tail flick method in albino rats. *Pongamia pinnata* showed dose dependent action in all experimental animal models.

**Antiulcer effect**

Mahendra a. giri et al[2] was investigated the antiulcer effect of hydroalcoholic extract of leaves of *P. pinnata* using different models of gastric ulceration in rats.
Antifungal properties
Digamber R. More et al\cite{3} was investigated for its antifungal properties using different plant parts – leaves, bark, roots and seeds. The powdered plant parts were extracted in three different solvents namely distilled water, ethyl alcohol and ethyl acetate. The plant parts were assessed for antifungal activity against two human pathogens: *Epidermophyton floccosum* and *Candida albicans* and two plant pathogens: *Alternaria solani* and *Helminthosporium turcicum*. The seeds of plants possessed highest antifungal activity followed by roots, bark and least activity was observed in the leaves. *Epidermophyton floccosum* was most susceptible to all the extracts closely followed by *Candida albicans* indicating the susceptibility to the components of the extracts. *Helminthosporium turcicum* was most resistant to all the extracts closely followed by *Alternaria solani* indicating the resistance to plant originated chemicals being familiar to such chemicals.

Pediculocidal and Ovicidal activity
Anbu Jeba Sunilson John Samuel et al\cite{4} was studied, various extracts of *Pongamia pinnata* leaves were tested against the head louse *Pediculus humanus capitis*. A filter paper diffusion method was conducted for determining the potential pediculocidal and ovicidal activity of chloroform, petroleum ether, methanol, and water extracts of P. Pinnata leaves. The findings revealed that petroleum ether extracts possess excellent anti-lice activity with values ranging between 50.3% and 100% where as chloroform and methanol extracts showed moderate pediculocidal effects. The chloroform and methanol extracts were also successful in inhibiting nymph emergence and the petroleum ether extract was the most effective with a complete inhibition of emergence. Water extract was devoid of both pediculocidal and ovicidal activities.

Antibacterial activity
Mary Shobha Rani\cite{5} was done the Methanol extracts of *Pongamia pinnata* L(PPM) showed higher antibacterial activity than ethanol extracts of *Pongamia pinnata* L(PPE).

Antiulcer activity
M. Sravan Prasad et al\cite{6} was evaluated the antiulcer potential of the methanolic extract of leaves of *Pongamia pinnata* was done against in vivo indomethacin-induced gastric ulcer using pylorus ligation method. All the doses of the leaf extract (100, 200 and 400 mg/kg) significantly (P < 0.01) reduced the ulcer index in this study.
Hepatoprotective effect
Saiprasanna Behera et al[7] was determine the possible protective effect of *Pongamia pinnata* (PP) hydro-alcoholic leaf extract, a plant rich in antioxidant, on hepatic ischemia/reperfusion (I/R) injury. Hydro-alcoholic leaf extract at the dose of 400 mg/kg/day reduced I/R-induced organ injury through its ability to balance the oxidant–antioxidant status.

Anti-inflammatory and analgesic activity
Mani Ganesh et al[8] were investigated for anti-inflammatory and analgesic activity at the doses (p.o.) of 100, 200, and 400 mg/kg body weight. For evaluation of inflammation carrageenan-, histamine- and serotonin induced paw edema served as acute models and cotton pellet–induced granuloma served as a chronic model in rats. The acetic acid-induced writhing response and hot plate method using mice were used to assess analgesic activity. The higher doses of PG (200 and 400 mg/kg, p.o.) were inhibiting carrageenan, histamine and serotonin-induced paw edema as well as cotton pellet –induced granuloma successfully. In addition, PG (200 and 400 mg/kg, p.o.) significantly attenuated the writhing responses induced by an intraperitoneal injection of acetic acid.

Anti-pyretic activity
Jimidi. Bhaskar et al[9] was investigating the anti-pyretic activity of methanol extracts of *Pongamia pinnata* Linn, leaves using experimental animal models. Antipyretic activity was evaluated using the brewer’s yeast-induced pyrexia in rats. The extracts in dose levels of 100 and 200 mg/kg orally were used for anti-pyretic studies.

Divya Singh et al[10] were evaluating anti-inflammatory and anti-arthritic activity of seed extract of *Pongamia pinnata* (L.). The stabilization of HRBC membrane showed a concentration dependent anti-inflammatory activity, and the protection percent increased with increase in the concentration of the P. pinnata hydroalcoholic extract.

Antiviral activity
Brijesh. S el al[11] was evaluated the Crude decoction of dried leaves of *Pongamia pinnata* was evaluated for its antimicrobial (antibacterial, antiigiardial and antirotaviral) effect; and its effect on production and action of enterotoxins (cholera toxin, CT; Escherichia coli labile toxin, LT; and E. coli stable toxin, ST); and adherence of enteropathogenic E. coli and invasion of enteroinvasive E. coli and Shigella flexneri to epithelial cells. The decoction had
no antibacterial, antigiardial and antirotaviral activity, but reduced production of CT and bacterial invasion to epithelial cells.

**Ayurvedic medicines with Pongamia pinnata as ingredient**

Karanja Taila – used in herpes, boils, abscess and eczema
Murivenna – Used for quick wound healing and to relieve pain and inflammation.
Vilwadi Gulika – used in scorpion bite, fever, toxic and psychological conditions.
Maha Manjishtadi Kashayam – Used in gout, syphilis etc Somaraji Tailam – Used in eczema, psoriasis etc.

**CONCLUSION**

*Pongamia pinnata* is an important Ayurvedic medicine, used various diseases. *Pongamia pinnata* twigs were used as tooth brush in ancient period. The Synonym is called *Millettia pinnata*. This plant having the potential pharmacological activity like antipyretic, anti inflammatory, and anthelmintic, styptic, and depurative. It is useful in rheumatism arthritis, whooping cough, skin ailments and scabies. Seed oil is mainly used in cosmetics, in soap making and as a lubricant. Seed oil is also used as insecticidal, nematicidal and bactericidal. Flowers are useful to quench dipsia in diabetes and for alleviating vata and kapha. Leaves are digestive, laxative and useful in flatulence, dyspepsia, diarrhea, leprosy and cough. Bark is anthelmintic and used in pesticides. Dried leaves are used in stored grains to repel insects. The bark also yields a black gum that is used to treat wounds caused by poisonous fish.

**REFERENCE**


