

Available online on 15.06.2020 at <http://jddtonline.info>

Journal of Drug Delivery and Therapeutics

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Review Article

Biological Potential of *Caesalpinia bonducella* Seeds: A Review

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ABSTRACT

Caesalpinia bonducella L. is a medicinal plant belonging to the family Caesalpiniaceae. The plant is found in all over India. The plant is a large prickly shrub. It is popular in indigenous system of medicine like Ayurveda, Siddha, Homoeopathy and Unani. In Indian traditional plant medicine, it has been considered as an important remedy for the treatment of several diseases. The plant has been reported to possess antimalarial, antifungal, antioxidant, anticancer, antipyretic, antifertility antiviral and antimalarial etc. activities of various parts of *C. bonducella* plant. It can be concluded that *C. bonducella* can become the best source of medicine in future on various ailments with further investigations. Hence attempts have been made to take collect and compile the information about the traditional use of various parts of *C. bonducella* in various ailments, chemical constituents from various parts and the effective use of various extracts for treatment of different diseases.

Keywords: *Caesalpinia bonducella*, Pharmacology, Nutritional Values.

Article Info: Received 27 March 2020; Review Completed 13 May 2020; Accepted 20 May 2020; Available online 15 June 2020



Cite this article as:

Gadakh MJ, Jadhav RS, Vikhe DN, Biological Potential of *Caesalpinia bonducella* Seeds: A Review, Journal of Drug Delivery and Therapeutics. 2020; 10(3-s):308-310 <http://dx.doi.org/10.22270/jddt.v10i3-s.4059>

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INTRODUCTION:

The herbal medications play most important role in the wellbeing framework of people over the world. It is required to comprehend the particular constituents in the herbal medications which are compelling in the diverse treatments. There are numerous verifications showing the significances of herbal plants utilized in the distinctive traditional frameworks.¹ It is seen that numerous restorative plants are utilized to fix ailments like stomach related issues, cardiovascular disorders, metabolic issues, liver issue, kidney issue and the disorders of central nervous systems.² Phytochemicals are essential for the assurance of plants just as insurance of individuals from different types of diseases.³ At the most 5% of the 300,000 types of the plants worldwide have been examined experimentally for their therapeutic use. It is seen by the specialists that the developing nations rely upon the medicinal plants to fix the sicknesses especially in the district where there is the absence of hospitals.⁴ *Caesalpinia bonducella* is ordered under the group of Caesalpiniaceae. It is otherwise called *C. bonducella* Flem and *C. crista* Linn. Generally it is called Fever Nut, Bonduc Nut and Nicker Nut also.⁵ In traditional system of Indian, i.e Ayurveda, *Caesalpinia bonducella* (roxb) is generally utilized for its antiperiodic, antipyretic, calming, anthelmintic, antimalarial and

further more for various infections like skin ailments, hydrocele, leprosy, spasms, orchitis, paralysis and analogical nervous complaints. It additionally described to have antioxidant, antibacterial, antitumor and antidiabetic actions.⁶ It is valuable to set up the moisturizer for the treatment of agony type cellulitis in Chinese customary medicines.⁷

PHARMACOLOGICAL ACTIVITY:

Antioxidant Activity:

The ethanolic concentrates of *C. bonducella* seeds contained good level of phenolic constituents and were prepared for repressing, quenching free radicals to cease the radical chain reaction, and acting as reducing agents.⁸ The potential antioxidant activity was confirmed by DPPH for ethanol leaf extract of *Caesalpinia bonduc*. The results demonstrate that the antioxidant activity may add to the cytotoxic nature of the plant which may be the future study to be carried out.⁹ Chloroform extract of *Caesalpinia bonducella* seeds shows antioxidant activity.¹⁰

Anticancer:

Caesalpinia bonducella is compared with already established anti-cancer drugs, the binding energy was highly comparable as well as interactions with the proteins. They further possess good ADMET characteristics, indicating

these phytochemical isolates can likewise be viewed as safe and thus be further developed into active commercial anti-cancer drugs.¹¹

Antiviral Activity:

An ethanolic extract of the root and stem exhibited activity against the Vaccinia virus.¹² Anti-Amyloidogenic/Alzheimer's disease Caesalpinia leaf aqueous extract has anti-amyloidogenic potential. Study showed aqueous extract of Latakaranj could inhibit the Abeta aggregation from monomers and oligomers and able to disintegrate the preformed fibrils.¹³

Antipyretic Activity:

The *Caesalpinia bonducella* seed kernel extract showed marked antipyretic action against Brewer's yeast-initiated pyrexia in rats. The concentrate had good central analgesic action in hot plate and tail flick methods. In conclusion, the study suggested that the ethanolic extract of *Caesalpinia bonducella* seed kernel has strong antipyretic and antinociceptive activities and thus, approves its utilization in the treatment of pain and pyretic disorders.¹⁴ The seed oil of *C. bonducella* is good source for antipyretic agent.¹⁵

Antifungal Activity

The aqueous and ethyl acetic acid extracts of *C. bonducella* seeds show high to moderate antifungal activity against *Alternaria solani*, *Fusarium oxysporum*, *Candida albicans* and *Aspergillus niger*. It indicates *C. bonducella* possesses a potential to control important fungal pathogens. It might be because of the presence of a few bioactive molecules that include oils, saponins, sterols, glycosides, tannins, alkaloids, phenols, resins and flavonoides in seeds of *C. bonducella*.¹⁶

Antifilarial Activity:

C. bonducella- seed part demonstrated microfilaricidal, macrofilaricidal and female-sterilizing adequacy against *L. sigmodontis* and microfilaricidal and female-sterilizing viability against *B. malayi* in animal models, demonstrating the capability of this plant in giving a lead to new antifilarial tranquilize development.¹⁷

Antimalarial Activity:

Cold ethanol, aqueous and hot ethanol extracts of seeds of *Caesalpinia bonducella* showed 56%, 65% and 76% growth inhibition of *P. falciparum* respectively. It supports antimalarial activity of *C. bonducella*.¹⁸

Neuroprotective Activity:

The methanolic and aqueous extract of *Caesalpinia bonducella* (Roxb) has shown significantly neuroprotective activity compare to the standard drug (Vitamin E). Different extracts of the *Caesalpinia bonducella* (Roxb) exerts remarkable antioxidant activity due to possible multiple effects involving significant protection against the oxidative damage, which might be credited to its protective activity on lipid peroxidation and resistance adding to the assurance against oxidative damage.¹⁹

Diuretic Activity:

Both the aqueous and methanol concentrates of *C. bonducella* demonstrated a dose-dependent rise in urine discharge. As for the aqueous concentrate, the maximum increase in urinary excretion was created at 300 mg/kg compared with the methanol extract. Study provide a quantitative basis to explain the traditional use of *C. bonducella* as a diuretic agent in Moroccan population.²⁰

Anti-fertility Activity:

The administration of test drug *Caesalpinia bonducella* exhibit potent antiimplantation activity, anti-estrogenic activity, abortion and anti-estrogenic activity, antioovulatory activity. *Caesalpinia bonducella* Linn. Roxb. Root bark (ERb) can be used for induction in sterility i.e. It can be used as anti-fertility agent.²¹

Nutritional values:

C. bonducella has been reported to contain the nutrients such as crude fibre 12.79 - 14.07%, Protein 18.65 - 20.32%, Fat 6.54 - 7.23%, Carbohydrate 16.91- 18.56%, Food energy (Kcal/100g) 376.27 - 402.12, Calcium 0.150 - 0.184%, Phosphorus 0.17 - 0.22%, Sodium 0.07 - 0.08%, Iron 0.22 - 0.5%, Vitamin C 0.016 - 0.043 (IU/g) and Vitamin A 416.75 - 700.14 (IU/g)²²

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