



MEDICINAL BENEFITS OF *ARECA CATECHU* - A REVIEW

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ABSTRACT

Areca catechu is commonly grown abundantly in coastal Karnataka. The seed of the plant areca is part of various ayurveda medicinal formulations indicated in different diseases. Also chewing betel nut along with betel leaf is not only mentioned in Ayurveda but also it is a part of Indian tradition which is named as tambula sevana which helps in digestion of food. There are different folklore practices related to this tree, where its different parts are used as medicine for burn wounds, to avoid abortion etc. The efficacy of these practices has been proven through various studies and also research has explored newer uses of this tree, like the arecoline found in seed is found to be efficacious in AD. Hence this review aims at compiling the proven medicinal benefits of different parts of the tree with an aim to aid further researches to benefit medical practices, as the drug is available abundantly.

Keywords: *Areca Catechu*, Folklore practices, Arecoline

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INTRODUCTION

Acacia catechu is abundantly found in coastal Karnataka. It belongs to the family of Arecaceae. It is a tall, solitary, erect tree growing up to approximately 15–25 m high and 10–20 cm in diameter. The stem is “woody” and gray with conspicuous nodes. The leaves are present as fascicles at the top of the stems. The leaves are 1.3–2.7 m long (including petiole) and are light green to green; the lanceolate blades are multitudinous and both surfaces are glabrous with lengths of 30–60 cm and widths of 2.5–4 cm^[1].

AIMS AND OBJECTIVES

This review aims at compiling the common folklore practices related to different parts of *Acacia catechu* and the research works which have been conducted on various parts of this tree to aid further researches.

MATERIALS AND METHODS

Few folklore practitioners and Ayurveda doctors were interviewed regarding the uses of *Acacia catechu* in and around Moodbidri, Karnataka. Also all papers related to *Acacia catechu* were reviewed using keywords related to parts of this tree in PUBMED, Google and Google Scholar. Review articles, animal studies, clinical studies, analytical studies were all included.

The articles related to its uses in curing plant diseases and veterinary uses were excluded.

Medicinal benefits of Roots

Roots have been used in folklore medicine like the decoction of root is used in Cambodia for liver disorder and sore lips^[2] We found few studies on the roots of *Acacia catechu* exploring its pharmacological properties. The root has been reported to possess antibacterial and antifungal properties. The root extract showed better efficacy than leaf extract and the conventional chemical bactericide, Chloramphenicol against *Pseudomonas aeruginosa* and several other bacteria.

Medicinal benefits of stem

The stem is whitish in color and grows tall. In coastal regions the stem processed to oil has got anti-inflammatory action and is found effective in joint pain among the elderly. There are various research studies related to stem and stem bark of *Acacia catechu*. Barman *et al.* is one such which proved the efficacy of crude methanol extracts of stems in acetic acid induced gastric pain writhing model in Swiss albino mice. The study also suggested dose dependent reduction of constrictions in doses of 50, 100, 200 and 400 mg extract administered per kg body weight^[3]. Studies have also suggested the efficacy of *Acacia catechu* stem in reducing

serum glucose levels dose-dependently using its methanol extract and was also significant when compared with the control^[4].

Medicinal benefits of Leaves

The leaves are used in its wet as well as dry form for various pharmacological property. *Acacia catechu* leaf sheath burnt made into ash mixed with oil when applied over the abscesses shows suppurative action and it's also found effective in nailbed infections among the rurals of coastal Karnataka. In few South east Asian countries, *Acacia catechu* leaves are used internally for respiratory ailments like bronchitis, cough and juice of tender leaves is mixed with oil and applied as an embrocation in cases of lumbago^[5].

Studies have proven its antinociceptive activity which was comparable to that of 400 mg aspirin per kg body weight even at the lowest dose of 50 mg extract per kg body weight ^[6]. The leaves have shown antibacterial effects against *Bacillus cereus* and *Pseudomonas fluorescens*^[7]. They are proven as anti-inflammatory through protein denaturation method and by HRBC membrane stabilization method. With Diclofenac sodium being used as a standard drug, chloroform extract, and methanolic extract showed significant percentage inhibition when compared to the control^[8]

Medicinal benefits of Flowers

Flowers of *Areca catechu* are unisexual, with the same inflorescence containing both male (staminate) and female (pistillate) flowers. Both types of flowers have six petals. Female flowers are bigger in size (1.2–2 cm [0.5–0.8 in] long), borne at the base of each terminal branch. It has six minor sterile stamens and an ovary having three cells carrying a triangular stigma along with three different points at the apex. Several male flowers spread from there out to the tip of the branch. The folklore practitioners often use the inflorescence of *Acacia catechu* along with sugarcandy is used internally in gynecological problems, pregnancy and also in regulating ovulation. The flowers of *Acacia catechu* are often used in the Unani system of medicine for different uses like to clear oral secretions and strengthen teeth and gums. It has been known to be an appetizer, febrifuge, diuretic, haemostatic, cardiotoxic, aphrodisiac, and also used to treat leucorrhoea and diarrhoea. The flower juice is indicated to be taken with betel leaf to aid digestion^[9-12].

Studies have proven its superoxide radical scavenging activity and reduce Power in a dose-dependent manner. The distilled water extract had higher activity than its methanol extract^[13].

Medicinal benefits of fruit and seeds

The fruit of the plant is ovoid, green when unripe and bright orange when it ripens and the ripened fruit peeling acts as tincture for wound and ulcers. The seed or endosperm is known as Areca Nut or betel nut. The medicinal properties of Arecanut have been known for more than 2000 years. This is the most commonly used part of the plant possessing various In fact, various pharmacological activities. The unique aroma of this nut makes it a good mouth freshener and due to its ready availability it's widely used among the coastal people.

In folklore practice the betel nut powder is commonly used in prameha condition. Also the nut is processed into oil and is used in ring worm infestation mainly in coastal Karnataka. Betel nuts have been used in toothpaste to prevent cavities due to antibacterial properties and also made into a dentifrice due to astringent properties [14,15].

Arecanut has been proven to have tannin content and therefore acts as good digestive and laxative and its impact on different systems of the body in different forms in Ayurvedic system of medicine.

In the gastrointestinal system, pretreatment of *Acacia catechu* was effective in protecting the gastric mucosa in doses of 250mg/kg and 500mg/kg^[16]. Arecanut contains arecoline, It has been which can stimulate the choline *M* receptor and promote an increase in

sweating, salivation and peristalsis which helps to improve human digestive function^[17]. Salehi et al suggested that arecanut possess the properties to act against diarrhea, ulcers, dyspepsia, gastrointestinal inflammation, flatulence, hyperemesis grvida^[18]. Aqueous extracts of *Areca catechu* L. have been proven to be potent antioxidant and anti-inflammatory. It has also shown hepatoprotective action by reversing the oxidative damage in hepatic tissues induced by CCl₄^[19].

In the neurological system, Arecanut helps in improving learning and memory. Arecoline activates *M* receptors and stimulates parasympathetic nerves, provides acetylcholine like effect and also can have inhibitory effect on GABA which brings excitement. Arecoline has been giving encouraging results in Alzheimer's dementia also^[20-22]. The other constituents of seed like Arecaidine and guvacie inhibits uptake of GABA and α -alanine, with very little anticonvulsant activity^[23]. Betel nuts cause euphoric effects. Arecoline also helps in treating neurological disorders owing to its cholinergic property^[24].

In the cardiovascular system, studies suggest anti-hypertensive effects of betel nuts^[25]. Chewing betel nuts shows symptoms which suggest an increase in blood flow within a short time period.

Areca nut has shown its effect on hormones like reducing serum estradiol levels in female mice suggesting its use as contraceptive^[26]. It is proven to be antibacterial against primary cariogenic bacteria, *Streptococcus mutans*, and glucosyltransferase from *S. mutans* and also antimalarial^[27,28].

Many studies have proven the anti-diabetic and hypoglycemic activity of areca nut. It is considered as a natural α -glucosidase inhibitor that treats postprandial hyperglycemia^[29]. It was also proven in an in vitro study that arecoline helps survival and growth of glial cells^[30]. The hexane and aqueous fractions have shown antidepressant potential^[31]. Areca nut extract has shown an increase in collagen synthesis, improvement in skin elasticity, skin hydration and skin wrinkles which suggests its anti-aging property and future use in cosmetics^[32]. Areca extracts have proven to be hypolipidemic by lowering the triglyceride absorption and plasma lipid concentration^[33]. Areca nuts have shown beneficial effects in wound healing. Different extracts have been evaluated on incision, excision and burn wounds. The polyphenols present in the seed are hypothesized to enhance healing in burn wounds and alkaloids to increase the tensile strength and faster contraction of wounds^[34].

CONCLUSION

Thus the review shows the multiple benefits of the tree in different aspects. It also provides a newer understanding of the reason behind using the seed, flowers and leaves in day-to-day life in India (esp. coastal Karnataka). Though its benefits are recognized, most of them are preliminary studies. Also there are only a few studies found with respect to its roots and flowers. There is a need to conduct different types of studies related to this tree as it is easily available and all parts are useful. Hence the review might aid further research which will help to use *Areca catechu* efficiently in medical practice.

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