



AN OVERVIEW ON ACACIA CATECHU

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ABSTRACT.

Acacia catechu a moderate sized tree, found mostly in dry parts of India is belonging to family leguminosae sub family: mimosiasae. Heart-wood, light red, turning brownish-red to nearly black with age, attached with whitish sapwood, fracture hard, taste, astringent (protein precipitator). *Acacia catechu* commonly known as Katha or Karangali is widely used in India for its various pharmacological effects. It is used in the treatment of passive diarrhea either alone or in combination with cinnamon or opium. The main chemical constituent of *Acacia catechu* are catechin, epecatechin, epigallocatechin, epicatechingallate, phloroglucin, protocatechuic acid, quarcetin, poriferasterol glycosides, lupenone, procyanidin, kaemferol, L-arabinose, D-galactose, D-rhamnose andaldobiuronic acid, afzelchin gum ,mineral and taxifolin. Catechin: biologically highly active. It is used as a haemostatic agent. The concentrated aqueous extract known as Khayer gum or Kutch is an astringent, cooling and digestive, beneficial in cough and diarrhea, applied externally to ulcer, boils and skin eruptions and is used extensively in Ayurvedic formulations. The seeds of the plant are reported to possess hypoglycemic activity in rats. *Acacia catechu* also shows hypotensive effect. The water decoction of *Acacia catechu* is widely consumed as health drink especially in Kerala and other south Indian states. It is believed that the water decoction can purify blood, improve skin texture and boost body's defence mechanism (personal communication). Since, the plant is widely used for treatment of various ailments and is a constituent of many formulations.

KEYWORDS: *Acacia catechu*, Astringent, Catechin, Epecatechin, Epigallocatechin, Quarcetin etc.

INTRODUCTION

Immunomodulatory agents are used to either suppress or stimulate the immune responsiveness of an organism against the invading antigens. Several plant products have been reported for immunomodulatory activity and many formulations of these plant products are available to enhance the immune system. The dried bark of *Acacia catechu* (family: leguminosae, sub family: mimosiasae) commonly known as Katha or Karangali is widely used in India for its various pharmacological effects. It is used in the treatment of passive diarrhea either alone or in combination with cinnamon or opium [1]. The concentrated aqueous extract known as Khayer gum or Kutch is an astringent, cooling and digestive, beneficial in cough and diarrhea, applied externally to ulcer, boils and skin eruptions and is used extensively in Ayurvedic formulations [2]. The bark in combination with other drugs is prescribed for snakebite [1]. The seeds of the plant are reported to possess hypoglycemic activity in rats [3]. *Acacia catechu* also shows hypotensive effect [4]. The water decoction of *Acacia catechu* is widely consumed as health drink especially in Kerala and other south Indian states. It is believed that the water decoction can purify blood, improve skin texture and boost body's defence mechanism (personal communication). Since, the plant is widely used for treatment of various ailments and is a constituent of many formulations, apart from its long term use as health drink, the present study was undertaken to investigate its effect on cell mediated and humoral immunity.

CULTIVATION The tree can be propagated by planting its seeds, which are soaked in hot water first. After about six months in a nursery, the seedlings can be planted in the field [5].

DESCRIPTION

- a) Macroscopic Heart-wood, light red, turning brownish-red to nearly black with age, attached with whitish sapwood, fracture hard, taste, astringent.
- b) Microscopic Transverse section of heart-wood shows, numerous, uni-to bi-seriate medullary rays, vessels occurring isolated or in small groups of two to four, xylem fibres with narrow lumen occupying major portion of wood, xylem parenchyma usually predominantly paratracheal, forming a sheath around vessels, wood consists of crystal fibres with 14-28 segments, each having one prismatic crystal of calcium oxalate, a few tracheids with scalariform thickening, some of cells, including vessels, filled with brown content, prismatic crystals

of calcium oxalate present in a number of cells throughout the wood. Powder- Brown coloured, under microscope shows a number of xylem fibres, vessels, crystal fibres and prismatic crystals of calcium oxalate.

ACTIVE CONSTITUENTS

The main chemical constituent of acacia catechu are catechin, epecatechin, epigallocatechin, epicatechingallate, phloroglucin, protocatechuic acid, quarcetin, poriferasterol glycosides, lupenone, procyanidin, kaemferol, L-arabinose, D-galactose, D-rhamnose andaldobiuronic acid, afzelchin gum ,mineral and taxifolin. Catechin: biologically highly active. It is used as a haemostatic agent.

PHARMACOLOGICAL ACTIVITIES AND USES

Taxifolin: it possess antifungal, antiviral, antibacterial, antiinflammatory and anti oxidant activity.

Parts used: Leaves, Bark and Heartwood. In a Study Pawar *et al* explained a dentifrice herbal tooth powder which removed plaque, stain or patches and cleaned and polished tooth surfaces without any abrasive action. The composition comprised the powder of *Acacia catechu*, Menthol and camphor in the proportion of 91%, 2.7% and 6.3% respectively. The powder of *Acacia catechu* was used to remove tarter, plaque and stain and in cleansing and polishing tooth surface without any abrasion action. The powders of menthol and camphor were used as a flavouring agent. A clinical study on this dentifrice herbal tooth powder reported 87-95%, 70-72% and 80-95% reductions in plaque, gingivitis and dental calculus respectively, in about 15 days of treatment [6].

Acacia catechu heartwood extract is found to be an effective antibacterial agent. A study conducted in ethanolic and aqueous heartwood extract of acacia catechu, proved its efficacy as a potent anti bacterial agent. Taxifolin present in heartwood of *Acacia catechu* is found to be responsible for its Anti bacterial effect [7]. Similar study was conducted to evaluate the potency of acacia catechu heartwood extract on dental caries causing microbes and organism associated with endodontic infections like *streptococcus mutans*, *streptococcus salivarius*, *Lactobacillus acidophilus* and *enterococcus faecalis* using disc diffusion method ,MIC and MBC [8].Dental caries is a microbial disease that results in destruction of mineralised tissues in the teeth. Streptococcus mutans and Lactobacillus acidophilus are potent initiator for Dental caries worldwide, hence our study shows that acacia catechu heartwood extract is highly active on oral pathogens and can be

applied in Dental practice in the field of periodontics to treat dental caries, gingivitis, mouth sores and Endodontics to treat enterococcus faecalis which is found in infected root canal possibly causes failure in root canal treatment.

Mycosis is a condition in which fungi pass the resistance barriers of the human or animal body and establish infections.

Fungal infections represent the invasion of tissues by one or more species of fungi. They range from superficial, localized skin conditions to deeper tissue infections to serious lung, blood (septicemia) or systemic diseases hence; an study was conducted to evaluate the anti mycotic activity of *Acacia catechu willd* on selected fungal species like *Candida albicans*, *Aspergillus niger*, *Aspergillus fumigates*, *Mucor spp.* and *Penicillium marneffeii*. Disc diffusion technique was followed for screening anti fungal activity. The results obtained from our study shows that ethanolic extract has got a very good anti mycotic activity against the selected fungal species [9]. Enteric bacteria comprised of *Salmonella sp.*, *Shigella sp.*, *Proteus sp.*, *Klebsiella sp.*, *E. coli*, *Pseudomonas sp.*, *Vibrio cholerae*, and *S. aureus*, which are major etiologic agents of sporadic and epidemic diarrhea both in children and in adults. A study was conducted to evaluate the anti bacterial activity of *Acacia catechu willd* on selected enteric pathogens. Antibacterial activity of ethanolic and aqueous extract of heart wood of *Acacia catechu* was screened against *Salmonella typhi*, [Gram negative bacilli-GNB], *Shigella flexneri* [GNB], *E.coli* [GNB], *Klebsiella pneumoniae* [GNB], *Vibrio cholerae*[GNB], *Pseudomonas aeruginosa*[GNB] and *Staphylococcus aureus*,[Gram positive cocci], using agar well diffusion technique. The results of this study showed that both the extracts at different concentrations exhibited anti bacterial activity against the bacterial species tested [10]. Hence *Acacia catechu* heartwood extract is also proven to be an effective medicinal plant to treat diarrhea caused by enteric pathogens.

IMPORTANT FORMULATIONS Khadiririshta, Arimedidi Taila, Khadiridi Gutiki etc.

DOSE 20-30 g of the drug for the decoction.

CONCLUSION

Acacia catechu is very common plant which is used by the individuals, because it is easily available in the market. It is much beneficial plant for various pharmacological activities such as immunomodulatory activity, hypoglycemic activity in rats, anti mycotic activity antifungal activity, antiviral activity, antibacterial activity, antiinflammatory activity and anti oxidant activity. Mycosis is a condition in which fungi pass the resistance barriers of the human or animal body and establish infections. A study was conducted to evaluate the anti

mycotic activity of *Acacia catechu willd* on selected fungal species like *Candida albicans*, *Aspergillus niger*, *Aspergillus fumigates*, *Mucor spp* and *Penicillium marneffeii*. Disc diffusion technique was followed for screening anti fungal activity. The results obtained from our study shows that ethanolic extract has got a very good anti mycotic activity against the selected fungal species. *Acacia catechu* was screened against *Salmonella typhi*, [Gram negative bacilli-GNB], *Shigella flexneri* [GNB], *E.coli* [GNB], *Klebsiella pneumoniae* [GNB], *Vibrio cholerae*[GNB], *Pseudomonas aeruginosa*[GNB] and *Staphylococcus aureus*,[Gram positive cocci], using agar well diffusion technique. The results of this study showed that both the extracts at different concentrations exhibited anti bacterial activity against the bacterial species tested.

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