

Acacia catechu (Katha) and its Medicinal Applications: A Review

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ABSTRACT

This review aims to have deep intensive knowledge about the general description and medicinal uses of *Acacia catechu*. *Catechu* is an extract of the wood of the *Khair tree*. This has been used for centuries throughout the world to treat several diseases. The drug has been in use for the treatment of infection, inflammation, pain management, skin diseases, and wounds. Recent studies have exhibited that this drug contains several phytochemicals that possess antimutagenic activities in cancer cells. The drug has also been used for the treatment of skin non-healing ulcers. This review article has demonstrated the different chemical constituents imparting in the healing of wounds/ulcers.

Keywords: *Acacia catechu*, Tannins, Fisetin, Catechin, Cyanidanol, Unani medicine, Non healing ulcers.

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Received: 08-07-2024;

Revised: 14-07-2024;

Accepted: 26-07-2024.

INTRODUCTION

Katha/ White catechu (Acacia catechu) is a genus of shrubs and trees that are a member of the subfamily *Mimosaceae* of the family *Fabaceae*. *Catechu* is an extract of the wood of the *Khair tree*. The process of decoction of *Acacia catechu* obtains it. It is present in the form of a white crystalline reddish substance. It has different types of varieties but the two major forms widely available are red and white. Several spikes are present in the plant; the leaves are similar to *barg-e-babool*, and the plant contains small yellowish flowers. *Acacia catechu* Willd. It is largely found in the forests of Eastern India.^[1,2,6] *Acacia catechu* is used in many pharmaceutical applications such as immunomodulatory, anti-hyperglycemic, hepatoprotective, anti-diarrheal, anti-nociceptive, anti-hyperlipidemic, anti-ulcer, antioxidant, anti-diabetic, anti-proliferative, anti-bacterial, anti-fungal, hemolytic, and anti-inflammatory.^[3]

Actions

The bark of the *Acacia catechu* is *Qābiḍ* (astringent) and is used fully in *Ishāl* (diarrhea) alone or combined with cinnamon or opium. Cutch from wood—powerful astringent (in urinary and vaginal discharge), *Hābis al-Ishāl* (antidiarrheal), *Hābis-i-Dam* (hemostatic); used for treating *Sayalān al-Mukhāt* (excessive

mucous discharges), *Jarayān al-Dam* (Haemorrhages), relaxed conditions of gums, throat and mouth, stomatitis, irritable bowel; also used as a *Dāfi'-i-Ta'āffun* (antiseptic) and *Dāfi'-i-Judhām* (antileprotic) drug. Indications of the dried pieces of heartwood in *Awrām* (inflammations), *Amrād-i-jild* (skin diseases), and *Amrād-i-Nizām-i-Bawl* (urinary system disorders), and recommends its use as a *Muṣaffī-i-Dam* (blood purifier), in diseases caused by lipid disorders. The heartwood contains a *Muḥāfiẓ-i-Jigar* (hepatoprotective) principle. Root extract shows antibacterial and fungicidal activity and seed extract shows leuco-agglutinating activity against leukemic cells.^[4,5]

Ethnobotanical Descriptions

A tree with a crooked trunk, spiny branches, brown bark, and reddish-black heartwood, attaining a height of about 12 m. Its leaves are bi-pinnate, each showing from 10 to 20 pairs of pinnae. Each pinna or lobe of the bi-pinnate leaf possesses from 20 to 30 pairs of leaflets. The flowers are yellow and borne on elongated dense racemes. The fruit is a brownish, flattened legume containing several brown shining seeds (Figures 1 and 2).^[6]

Habitat

Khair trees grow extensively in Uttar Bihar, Pradesh, Himachal Pradesh, Gujarat, and Madhya Pradesh. Maharashtra and to a lesser extent in the southern states of Karnataka, Andhra Pradesh, and Tamil Nadu. *Khair* trees are grown as a highly profitable commercial crop in Uttar Pradesh and Gujarat *Khair* trees are also found in Nepal and Burma.^[7]



DOI: 10.5530/phrev.2024.18.8

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Figure 1: *Acacia catechu* plant.



Figure 2: *Acacia catechu*.

Uses

Kath is used in the form of powder to treat the *Jarayān al-Dam* (hemorrhage), *Litha Dāmiya* (bleeding gums/ scurvy), *wrām-i-Litha* (gingivitis), and *Qulā'* (Mouth ulcer).^[1] Dusting powder of Kath is used on various types of *Qurūh* (wounds).^[1] Making a pill with nutmeg or cinnamon and feeding it is beneficial for diarrhea.^[8] *Katha* and *belgiri* mixed in equal quantity are useful in *Sahj-i-Amā'* (abrasion of the Intestine) and *Maghs / Maror* (intestinal colic).^[8] *Katha* along with *tabasheer* (Bamboo silica) useful in curing *Qulā'* (Mouth ulcer).^[8] For boosting gum strength, combine it with the seeds of *Bonducella* and *Ferri sulphas*.^[9] In cases of hoarseness, sore throat, voice loss, etc., a tiny piece held in the mouth and let to gently dissolve functions like an astringent lozenge. It is also very helpful in cases of mercurial salivation, bleeding, ulcerations, and sponginess of the gum.^[9] It can be used for chronic ulcerations with foul discharges when combined with lard or simple ointment.^[9] A small amount of powdered copper sulphate (15 grains per ounce) may be added in stubborn instances. The decoction helps clean painful or cracked nipples, and the tincture is a great treatment for bed sores that are at risk.^[9] *Kath-bol*, a concoction of catechu and myrrh, is given to mothers after childbirth as a tonic and to encourage milk supply.^[9] The heartwood is inhaled to stop bleeding from the nose.^[2]

Dose

1-3 g.^[1] Heartwood: 20-30 g for decoction.^[5]

Reformer/Musleh

Musk (*Moschus mosifera*) and *Amber* (*Ambergris*).^[10]

Substitute

Geru (Silicate of Alumina) and *Mazu* (*Quercus Infectoria*).^[10]

Compound formulation/Murakkabat

Zarur-e- Qulā, *Sanūn -e-post Magellan*, *Marham -e-Raal*.¹ *Sanūn -e-mustahkam dandan*, *habbe lemu*.^[10]

Chemical constituents

The pods contained steroids/terpenoids, flavonoids, tannins, phenolics, saponins, crude protein, ether extractive, nitrogen-free extract, calcium, phosphorus, iron, niacin, ascorbic acid, glycolipids, phospholipids. The leaves were found to contain hemicellulose, lignin, cellulose, and total minerals while the ethanolic extract contained quercetin, poriferasterol- β -D-glucoside, quercetin-3-0-arabinofuranoside, quercetin-3-0-rhamnoside, and quercetin-3-0-galactoside. The acetone extract of the heartwood contains epicatechin, dicatechin, catechin, kaempferol, dihydrokaempferol, taxifolin, and isorhamnetin and stem bark containing flavonoids. The gum from the bark was found to contain D-galactose, L-arabinose, D-rhamnose, and L-glucuronic acid.^[11]

Pharmacological studies

In addition, tannins have been discovered to be responsible for astringent action ions in the human body and have been thought to have good potential for treating wounds in the human body. These active compounds, such as catechin or epicatechin, perform significant functions as an anti-inflammatory and antioxidant agents.^[3] Steroids stimulate fibroblast collagen production, which accelerates wound healing.^[12] It has been proposed that flavonoids have anti-inflammatory properties that include inhibiting pro-inflammatory enzymes like lipoxygenase and cyclooxygenase-2, inhibiting NF-kB and Activating Protein-1 (AP-1), and activating phase II antioxidant detoxifying enzymes that aid in the healing process of wounds.^[13] Flavonoids reduce lipid peroxidation. They also delay the onset of cell necrosis. Improved vascularity supports the survival of collagen fibrils by minimising cell damage and aiding in wound healing. It also reinforces collagen fibres and promotes DNA synthesis.^[14] Astringent and antibacterial properties of catechu result from its high tannin content.^[5] Tannins aid in wound healing in a variety of ways, such as by scavenging reactive oxygen species and free radicals, promoting wound contraction, enhancing the formation of capillary channels, and stimulating fibroblast proliferation.^[15] Additionally, it was shown that *A. catechu*'s ethanolic bark extracts had anti-diabetic activities, which are attributed to the suppression of α -glucosidase and α -amylase activity.^[3] By preventing the oxidation of Low-Density

Lipoproteins (LDLs), reducing blood platelet coagulability, and raising coronary vasodilation, flavonoids, and Methyl-catechin also assist in reducing the risk of coronary artery disease and atherosclerosis.^[3,5] In research, the antiproliferative effects of *A. catechu* bark extracts/fractions on six human cancer cell lines—the A549 lung, PC-3 prostate, MCF-7 breast, Hep-G2 liver, HeLa cervix, and IMR32 cell line—were examined.^[3] *Epidermophyton floccosum*, *Trichophyton rubrum*, and *Microsporum gypseum* were the three human pathogenic fungi used in an *in vitro* evaluation of the antifungal activity of an ethanolic extract from *Acacia catechu*.^[3] Fisetin, catechin, and cyanidanol may protect against liver damage.^[5]

CONCLUSION

For many years, traditional medicine has utilized *Acacia catechu* alone or in combination with other suitable medications to treat various or in combination with other suitable medications to treat a variety of ailments. Additionally, it can be quite beneficial in treating and preventing some disorders. *Acacia catechu* should be further researched as a potential alternative for the treatment of wounds in light of the rising incidence of chronic disorders like non-healing ulcers.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the HoD Prof. Saiyad Shah Alam, who provided invaluable assistance and insights during the research process. Their expertise and guidance were instrumental in the successful completion of this study. We also

extend our thanks to National Institute of Unani Medicine for providing the necessary resources and facilities for this article.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Cite this article: Danish AM, Nasim M, Jarahat MSI, Alam SS. *Acacia catechu* (*Katha*) and its Medicinal Applications: A Review. *Pharmacog Rev*. 2024;18(35):82-4.