TRADITIONAL USES, MEDICINAL AND PHYTOPHARMACOLOGICAL PROPERTIES OF CAESALPINIA CRISTA LINN - AN OVERVIEW

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ABSTRACT

Caesalpinia Crista of family Fabaceae is a moderately size deciduous tree, growing wild throughout the deciduous forest of India. It is popular in indigenous system of medicine like Ayurveda, Siddha, Unani and Homoeopathy. In the traditional system of medicine various plant parts such as leaves, stem, root, seed and oils are used as anthelmentic, febrifugal, periodic, tonic, and vesicant. They are used to treat colic, convulsions, leprosy, and palsy. The oil from the seeds is said to soften the skin and remove pimples. The bark is antiperiodic, rubefacient and to counteract toothache.

The present review is therefore, an effort to give a detailed survey of the literature on its Phytopharmacological and medicinal properties and traditional uses.

Keywords: Phytopharmacological, Fabaceae, febrifugal, rubefacient, collyrium.

INTRODUCTION

Medicinal plants continue to be an important therapeutic aid for alleviating the ailments of human kind. The search for eternal health and longevity and for remedies to relieve pain and discomfort drove early man to explore his immediate natural surroundings and led to the use of many plants, animal products, and minerals, etc. and the development of a variety of therapeutic agents. Today, there is a renewed interest in traditional medicine and an increasing demand for more drugs from plant sources. This revival of interest in plant-derived drugs is mainly due to the current widespread belief that “green medicine” is safe and more dependable than the costly synthetic drugs, many of which have adverse side effects.

Description

Caesalpinia Crista of family Fabaceae is a prickly shrub or woody vine reaching a length of 10 m or more also known as Sagargoti (Marathi). Leaves are bi-pinnate, often nearly 1 m long, with the rachis armed with stout, sharp, recurved spines. The leaflets also number 10 pairs and are oblong, 2 to 5 cm long and somewhat hairy. The Flowers are yellow, borne in axillary, simple or panicled raceme and about 1 cm long. The Fruits are pods, oblong 5 to 7 cm in length, inflated and covered with slender spines and contain one or two seeds. The seeds are large, somewhat rounded or ovoid, hairy, grey and shiny.

Uses

The famous utility in Satpuda region among the Adivasi people is anthelmentic. The other mentioned utility of different parts like seeds are sometimes used in necklaces are considered febrifugal, periodic, tonic, and vesicant. They are used to treat colic, convulsions, leprosy, and palsy. The oil from the seeds is said to soften the skin and remove
pimples. The bark is antiperiodic, rubefacient and plant to counteract toothache. A leaf decoction is as collyrium. The different parts such as Leaves, seed, root, bark is also used in Colic fever, intermittent fever, malaria, menstrual complaints, pneumonia, skin diseases, swelling, tonic, pulmonary tuberculosis and as a uterine stimulant, to cleanse the uterus. It also alleviates the fever, edema and abdominal pain during this period.

SYNONYMS
Caesalpinia paniculata, Caesalpinia paniculata, Guilandina paniculata, Guilandina semina Lour.

VERNACULAR NAMES
English name: Teri pods, Fever nut.
Hindi: Katuk Ranja, Karanjava.
Marathi: Sagargoti, Gajra, kanchak.
Sanskrit: Putrakaranj.
Gujarati: Kanchaki, Kankachia.
Bengali: Lata Karancha.
Kannada: Gujugi, Gaduggu.
Tamil: Kalarkodi, Kalichikai.
Telugu: Guchepikka Kachkai, Gachakaya.
Konkani: Vakeri.

Fig.1: Flowers of C. crista  
Fig.2: Fruits of C. crista

TAXANOMY
Caesalpinia crista falls under the scientific classification as follows

Scientific classification
Kingdom: Plantae
Phylum: Magnoliophyta
Class: Angiospermae
Order: Fabales
Family: Fabaceae
Genus: Caesalpinia

Species: Caesalpinia crista.

HABIT AND HABITAT
The plant grows all over India especially in sea coast and in many forests and hills. It is frequently found around the marshy land, plain land. The Plant is a prickly shrub or woody vine reaching a length of 10 m.

Table 1: Morphological and General Characters

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Shrub</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foliage</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Roots</td>
<td>Deep roots, Tap roots</td>
</tr>
<tr>
<td>Type of stem</td>
<td>Hard Wooded</td>
</tr>
<tr>
<td>Leaf Type</td>
<td>Bipinnately Compound, Elliptical, Ovate</td>
</tr>
<tr>
<td>Leaf Arrangement</td>
<td>Alternate</td>
</tr>
<tr>
<td>Leaf Colour</td>
<td>Green</td>
</tr>
<tr>
<td>Leaf Surface</td>
<td>Glossy</td>
</tr>
<tr>
<td>Odour</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Taste</td>
<td>Bitter</td>
</tr>
<tr>
<td>Plant Height</td>
<td>Medium (10-20m)</td>
</tr>
<tr>
<td>Actual Height</td>
<td>Maximum: 15 Meter</td>
</tr>
<tr>
<td>Plant feature</td>
<td>Forest, hill side, ornamental, sea side plant, Spiny</td>
</tr>
<tr>
<td>Plant Utilities</td>
<td>Flower and Garden, Industrial, Commercial and Medicinal Plant</td>
</tr>
<tr>
<td>Season</td>
<td>Perennial</td>
</tr>
</tbody>
</table>
PHYTOCONSTITUENTS PRESENT
The preliminary phytochemical investigation showed the presence of carbohydrates, alkaloids, Glycosides, tannins, flavonoids & Coumarins.

TRADITIONAL/AYURVEDIC UTILITIES
Caesalpinia crista is used in vast range of diseases. It is the best panacea for abdominal pain due to flatulence, as it effectively alleviates the vata dosha. The powder of its roasted seeds with ghee mitigates the condition and relieves the pain. During postpartum period, the abdominal pain is eliminated with the roasted seed powder, asafoetida, ghee and little amount of salt. The seeds powder, given with milk, controls the diarrhea. The skin of the seed being astringent is beneficial as a medicament for diarrhea, dysentery and colitis. In worm infestations, the juice of its leaves or powder of its roasted seeds is given along with palasa, amra and haridra.

Latakaranja (combination of its roasted seeds powder and pippali (1:1) with honey) is the best medication for malarial fever. The combination of its roasted seeds powder, pippali (1:1) is given with honey, approximately 0.5 gm., three times a day for 3-4 days duration. Another combination recommended for malaria is the powders of marica and latakaranja (Sakra vati). The splenic enlargement due to malaria, responds well to latakarnja. The leaves fried in ghee, eliminate vata and relieve constipation, hence valuable in piles.

The seeds are stimulant to the uterus, improve the menstrual discharge in oligomenorrhea and reduce the pain in lower abdominal region. The skin of the seed is extremely beneficial in the treatment of leucorrhea. The seeds also render contraceptive activity. Latakaranja is used as a bitter tonic. It is also a useful remedy for cough and asthma, as it alleviates the kapha dosha. For this purpose, the tender leaves (fresh juice) are given along with the honey to ward off the mucous secretions. The oil prepared from the leaves, is a valuable nervine tonic.

PHYTOCHEMICAL PROPERTIES
The literature has revealed that seeds and leaves of plant contain around fourteen compounds. The isolated compounds are cassane and norcassane-type diterpenes. The stem part and root part constituents two novel peltogyonoids, pulcherrimin and 6-methoxy-pulcherrimin, one novel homoisoflavonoid, 8-methoxybonducellin, and the known compounds bonducellin, 2, 6-dimethoxybenzoquinone, 2', 4', 4-trihydroxychalcone and 2', 4-dihydroxy-4'-methoxychalcone. From the methanolic extract of seed kernels of Caesalpinia crista from Myanmar, five new cassane-type diterpenes, caesalpinins MA-ME (1-5), and three new norcassane-type diterpenes, norcaesalpinin MA-MC (6-8), have been isolated, together with 12 known cassane-type diterpenes, 14(17)-dehydrocaesalmin F, caesaldekarin e, caesalmin B, caesalmin C, caesalmin E, 2-acetoxy-3-deacetoxycaesaldekarin, 2-acetoxycaesaldekarin, caesalpinin C, 7-acetoxybonducellpin C, caesalpinin E, norcaesalpinin B, and 6-acetoxy-3-deacetoxycaesaldekarin.

PHARMACOLOGICAL PROPERTIES
1. Anthelmintic activity
The bark extract of Caesalpinia crista (L.) were evaluated for anthelmintic activity using adult earthworms, which exhibited a spontaneous motility (paralysis) With 50 mg/ ml of aqueous extract the effects were compared with 3% piperazine citrate. There was no final recovery in the case of worms treated with aqueous extract in contrast to piperazine citrate, the worms recovered completely within 5 hrs. This result shows the anthelmintic nature of the extract.

Anthelmintic activity of Caesalpinia crista (L.) against trichostrongylid nematodes of sheep, study showed C. crista possess anthelmintic activity in vitro and in vivo, supporting its traditional use in Pakistan.

2. Antimalarial activity
Most of the plant from Caesalpinia species shows antimalarial activity. The isolated diterpenes such as 44 cassane- and norcassane-type diterpenes. Most of the tested diterpenes showed antimalarial activity, norcaesalpinin E showed the most potent activity, more than the drug chloroquine.

3. Antioxidant activity
Study showed the methanolic extract of Caesalpinia crista has potent antioxidant activity and ROS scavenging activity as well as
iron chelating property. (2) Ethyl acetate extract showed a maximum of 49% free radical scavenging activity at the end of 1 hr.

4. Antidiabetic / Hypoglycemic
Most of the plant from Caesalpinia species shows Antidiabetic and Hypoglycemic activity. The ethanolic extract (250mg/ kg/day) lowered blood glucose level within 2 weeks in the alloxan diabetic albino rats confirming its hypoglycemic activity. β -sistosterol isolated from the stem bark was found to posses potent hypoglycemic activity when compared to other isolated compounds. (1) The seed kernel of Caesalpinia bonducella has significant antidiabetic and hypoglycemic effects. Activity may be partly due to a positive effect on glycogen synthesis in the liver, skeletal muscle and heart muscle due to an insulin-like action of its constituents and partly due to stimulatory action on insulin release. (2) The ethanolic and aqueous extracts showed significant blood sugar lowering effect of C. bonducella. (3) The aqueous extract of C. bonducella seed shell showed very significant blood sugar lowering in glucose loaded STZ and alloxan diabetic models.

5. Antifilarial
The Caesalpinia bonducella seed kernel extract and fractions showed microfilaricidal, macrofilaricidal and female-sterilizing efficacy against L. sigmodontin and microfilaricidal and female-sterilizing efficacy against B. malayi in animal models, suggesting a potential for its use in new antifilarial drug development.

6. Anxiolytic Activity
The seed extract of C. bonducella showed a significant and dose dependant anxiolytic activity.

7. Antitumor / Antioxidant Activity
Study of methanol extract of Caesalpinia bonducella showed significant antitumor and antioxidant activity in Ehrlich ascites carcinoma (EAC)-bearing mice.

8. Analgesic Activity
The flower extract of Caesalpinia bonducella showed significant antinociceptive effect in the inflammatory phase of formalin-induced pain and acetic-induced parietal pain.

9. Analgesic / Antipyretic / Anti-Inflammatory
The seed oil of Caesalpinia bonducella could be a potential source of an anti-inflammatory, antipyretic and analgesic agent.

10. Immunomodulatory
The aqueous extract of Caesalpinia bonducella seeds on cell mediated and humoral components of the immune system in rats produced an increase in hemagglutinating antibody titer and a change in delayed-type hypersensitivity suggesting that the extract could be a promising immunostimulatory agent.

11. Anti-Amyloidogenic / Alzheimer's disease
Caesalpinia crista leaf aqueous extract has anti-amyloidogenic potential. Study showed aqueous extract of C. crista could inhibit the Abeta (42) aggregation From monomers and oligomers and able to disintegrate the preformed fibrils.

12. Nootropic / Memory Enhancer
Dried seed kernels of Caesalpinia crista extract have a potential as a learning and memory enhancer. Results suggest C. crista can be beneficial in improving cognition in disorders like demential and other neurodegenerative disorders.

CONCLUSION
The present study shows the Phytopharmacological properties of various bioactive compounds present in the plant. The leaves, seed kernels, seed oil, flowers and fruits are used in India for the treatment of various diseases. The different extracts of Caesalpinia crista shows anthelmintic activity, anti-amyloidogenic activity, immunomodulatory, analgesic, antipyretic, anti-inflammatory, antitumor, antioxidant activity, antidiabetic and hypoglycemic activity, and also used as nootropic or memory enhancer. The pharmacognostic parameters, which are being reported, could be useful in the identification and standardization of a crude drug. The data produced in the present investigation is also helpful in the preparation of the crude drug's monograph and inclusion in various pharmacopoeias. However, more Clinical and Pathological studies should be
conducted to investigate the active potentials of bioactive compounds present in this plant.

REFERENCES