Avartaki (Cassia Auriculata Linn) – A Review Article

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ABSTRACT
India has about 45000 plant species of which several thousands have been claimed to possess medicinal properties. In many countries traditional medicine forms an integral part of health care system. The knowledge of traditional medicine is very important for the new research work. Systematic documentation is lacking for many medicinal plants in India. One such plant is Avartaki (Cassia auriculata Linn) is described in Nighantu. Avartaki possess the hypoglycaemic, anti inflammatory, antioxidant, antihelminthic, antibacterial activity. More research is needed on this drug to evaluate the pharmacological activities of this drug. This review article deals with Historical review, Vernacular names, synonyms, ayurvedic properties, cultivation and harvesting, research works and therapeutic uses of Avartaki.

KEYWORDS: Avartaki, Cassia auriculata Linn, hypoglycaemic

INTRODUCTION:
In the 21st century, use of herbal medicines are widely used due to their safety, efficacy, and lesser adverse effects. Now a day’s plants have been used with varying success to relieve and prevent diseases all the time. According to WHO 80% of the world population depends on traditional medicine for health care needs.1

Cassia auriculata belonging to Caesalpiniaeae (Fabaceae) is common plant in India, widely used in Ayurveda medicine as a tonic and remedy for diabetes. Cassia auriculata Linn commonly known as Tanner's cassia, also known as "Vilayati Tarvad" in Marathi. The plant has been reported to antibacterial, hypoglycemic and microbicidal activity. The shrub is especially famous for its attractive yellow flower which used for the treatment of skin disorders and body odor 2

CLASSICAL REVIEW OF AVARTAKI
The word meaning of Avartaki is that which improves the complexion or glow of the body. Avartaki – Avarta ev kayti prakashate 3 And another meaning of Avarta is one which borne repeatedly

Vedic period and Samhita period - In Vedas and Samhita there is no mention of Avartaki

Samgraha period First time Acharya Vagbhata the author of Asthang hridaya mentioned Avartaki.

Nighantu kala
Dhanwantari Nighantu was written in 11th cent. All the drugs in this Nighantu are described in 11 Vargas. Synonym, property and action etc of Avartaki are described in Guduchyadi varga. Madanapala Nighantu was written in 14th cent. And its subjects are divided under 13 Varga. Here Avartaki is described in Abhyadi varga. In the same century Kayadeva Nighantu or Pathapathy Nighantu was formed. It is divided into 8 Vargas. This Nighantu also describes the properties of Avartaki in Aousadhi varga. Raja Nighantu (Abhidhanachudamani) divided in 23 Vargas. Here the introduction, properties of Avartaki fall in the Guduchyadi varga.

VERNACULAR NAMES 4
Sanskrit – Avartaki, Chamarang, Pitpusha
English – Tanners cassia, Tanner's Senna Mature tea tree
Hindi – Taroda, Tarval, Tarvar, Tarwal
Gujarati – Awal
Kannada – Tangedu, Taravadagida
Malyalam – Aviram, Avara, jumite, ponnaviram,
Tamil – Avarai, Avarae, Sadurguli, Semmalai, Summai.

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Species - R.N
Vamavisha-Nika - - - - - + - - -

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PROBABLE INTERPRETATION OF SYNONYMS
Interpretation of some important synonyms according to their derivations is given below
Aavrtaki - Which increase the complexion or glow of the body or which born repeatedly.
Aahulyam – Which spread on the ground.
Charmaranga, Charmaranjankarini, Ranagkara - Which used to stained the leather
Mahatali, Mahadajalini, Marutali, Mahajalinkha - The herb which spread like a net on the earth
Pitkala, Pitpushpa, Pitkalika, Pitkla, Pitkalikyukta- Flowers are yellow in colour
Raktapuspi, Raktapushpika - Flowers are red in colour

TAXONOMY 15
Systemic position
Kingdom - Plantae
Subkingdom - Trachobionta
Super division - Spermatophyta
Division - Magnoliophyta
Class - Magnoliopsida
Sub-class - Rosidae
Order - Fabales
Family - Fabaceae
Genus - Cassia
Species - auriculata
DISTRIBUTION AND HABITAT
The shrub occurs on roadside, wastelands, and railway embankments. It is plentiful in the drier districts of Andhra Pradesh, Karnataka, and Tamilnadu found in the dry zones of Southern, Western and central India extending up to Rajasthan in the North; also cultivated in some parts of Punjab, Haryana, Uttar Pradesh and West Bengal and often planted in garden for ornament and as hedges.

HABIT AND GENERAL FEATURE
A fast growing, profusely branched, tall evergreen shrub, generally 1.2- 3 m height, sometimes reaching up to height of 6 m.

EXTERNAL MORPHOLOGY
Leaves
Leaves nearly sessile, approximate 3-4 inch long rachis grooved, pubisient, furnished with a single linear gland between the leaflets of each pair, stipules broad, leafy persistent, their inner bases with filiform points.

Leaflets 8-12 pairs ¾ -1 inch long, very shortly petioled or almost sessile, more or less glabrous, slightly overlapping obovate-oblong obtuse or emarginated, mucronate, rigidly sub coriaceous, downy.

Inflorescence
Inflorescence Racemes axillary, nearly as long as the leaves, many flowered approximated toward the end of the branches.

Flower
Flowers large, yellowish about an inch long, shortly pubescent, pedicels forming long peduncled shortly pubescent bracted few flowers raceme in the axis of the leaves, bracts leafy, ovate to obovate, lanceolate, acuminate, 3-4 inch long, long persistent, calyx glabrous or nearly so, the sepals cilioate, petals-obovate, rounded, shortly clawed, nearly an inch long, filament glabrous, ovary shortly appressed pubescent, stamens 10

Fruits
Pods pale brown, oblong, 5.5 cm x 1.2-1.8 cm linear oblong at the base in a short stalk, terminating in a long filiform style, very flat, shortly and rather thinly pubescent.

Seeds
Dark brown in colour compressed, tapering towards the base. 6-12 seed per pod.
PROPERTIES OF AVARTAKI

**Table 3 Properties of Avartaki**

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**PROPERTIES**

**Rasa** - Almost all the Acharya given Kashaya and Tiktha rasa for this plant But Raj Nighantu has given Amla rasa.
**Guna** - In Kajiyadeva Nighantu Sara and Guru gunas given to this plant. P.V. Sharma and Yadavji Trikamji Acharya has given Laghu and Ruksha guna.
**Veerya** - There is no difference in opinion about its Seetha veerya.
**Vipaka** - There is no classical reference about vipaka. P.V. Sharma given Katu vipaka. And according to general rule Kashaya and Tiktha rasa possess Katu vipaka.

**KARMAM (ACTION)**

By virtue of their gunas, rasa and veerya the dravya performs certain actions on the body. Different karmas performed by Avartaki as mentioned by various authors are enlisted below.

**Table 4 Different action of Avartaki**

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The stem bark afforded the dimeric procyandin, fisetinidol, and 24.8 % of alcohol extract, in the former was estimated by partial acid hydrolysis.

The heartwood contains an anthocyanidin glycoside, pelargonidin-5-O-β-D galactoside.

THERAPEUTIC USES
Avartaki Ghrutha22 – This is the only one classical reference of Avartaki explained in Asthag hridaya. Prepared by the root of this plant. This should be consumed with interval of one day followed by eating mess of krodra along with unprocessed kanjika. This cured leprosy, lecderoma, and goiter. It also increase intelligence and memory.

A decoction of flowers and flower bud is an excellent remedy for diabetes, they are also used as pessaries to check an excessive menstrual flow.

An infusion of the leaves used as a cooling drink. The bark is highly astringent; it is a valuable substitute for tannic acid. It is also used as an alternative.

Decorticated seeds in fine powder or paste are valued for local applications to purulent ophthalmia or conjunctivitis known as “Country sore eye” seeds with their testas and their kernels are finely powdered and blown into the eyes or the powder mixed with coconut or gingelly oil is applied to sore eyes. Seeds are also use in diabetes and chylos urine.
The plant is used in the form of powder mixed with honey or the decoction, especially of flower buds, is administered in chylous urine and diabetes with excellent results. Twigs are used as tooth brushes in the south of Ceylon leaves are used as a substitute for tea. Coffee made from powdered seeds or leaves is good substitute for Coffea arabica and is usefully prescribed in giddiness due to heart disease.27

Flowers useful in urinary diseases, nocturnal emissiory, diabetes and throat infection and considered aid ful for promoting body colour or complexion.28

Dr. Krikpatrik (Cat. Of Mysore drugs) bring to notice the astringent properties of the bark, and speaks favourably of the use of the eyes in chronic purulent conjunctivitis.29

Bark astringent used by the natives to tan and dye leather of buff colour. Workers in iron employ the root in tempering iron with steel 30

The Leaves infusion acts as a cooling drink, and the paste with water and the seeds of Phaseolus radiates and poppy seed they are applied to hepatic eruption.

The leaves and flower juice with triphala churna are used for the treatment of diabetes. Root bark decoction used in hydrocele. In cholera, ajeerna, shula, vomiting, atisara like diseases the root bark is chewed with salt and juice is taken in as cure. In injuries sprains lepa of Avartaki, swarjika, tamarind leaves is very commonly used.31

CULTIVATION 7

➢ Soil and climate
It prefers red, gravelly, well- drained and lime rich soil. It grows on a variety of other soils also including the black cotton and the latinte near the seacoast, as it is not very exacting in its requirements although on water logged ground, the seedings are apt to lot.

➢ Natural Regeneration
The seeds germinate in plenty even on poor; shallow soils with meagre rainfall. Since the plant is very hardy and coppices well, it survives when heavily cut and for bark and for leaf-manure.

➢ Artificial regeneration
The plant is frequently been grown various parts of India forits bark for plantation, stiff, waterlogged or alkaline soil and forestry localities shouldition been avoided. Care being taken to select open places with light, porous, and not too moist soils. Ploughing the land before sowing is advantageous. Direct sowing have been much better results than transplanting. Sowing may be done either broadcast or in lines at aspacing of a 0.9 -1.2 cm for an optimum density. The latter is economical and preferable as it facilitates weeding, thinning or gap filling and interculturing. The seedlings should be thinned out during the first season where necessary, weeding and inter culturing through always not essential, Stumulatge growth irrigation is generally not necessary but flooding once a month, during day season, particularly in acid zone, increase the height.

RESEARCH STUDIES ON CASSIA AURICULATA LINN

1) The antibacterial properties of the Cassia auriculata were tested against ten human pathogens by using five different solvent namely, hexane, chloroform, ethyl acetate, acetone
and methanol. The maximum antibacterial activity recorded in methanol extracts against Vibrio cholerae and Staphylococcus aureus. In separation of compounds, ethyl acetate extract were more spots in (TLC) plate.34

2) The qualitative analysis of the extracts from the root and leaf sample of Cassia auriculata exhibited the presence of phytochemical constituents such as anthroquinone, alkaloids, flavonoids, phenolic compounds, saponins, steroids and tannins.35

3) The antimicrobial activity of crude leaf extract of Aegle marmelos, Chloris virgata, Collinsonia anisata, Feronia limonia and Cassia auriculata were studied in different concentrations (100mg/ml, 200 mg/ml, 300mg/ml) against four pathogenic bacterial strains. Antibacterial potential of leaf extract was assessed in terms of zone of inhibition of bacterial growth. Different concentrations viz., 100, 200, and 300mg/ml of each leaves were used for antimicrobial screening. The antibacterial activity of the extract increased linearly with increase in concentration of extract (mg/ml). The methanol extracts have shown significant antibacterial activity. The results show that among the leaves tested Cassia auriculata and Aegle marmelos was found to be more effective against all the microbes tested.36

4) Effect of cassia auriculata flowers on blood sugar levels, serum and tissue lipids in streptozotocin diabetic rats- in this experimental study Cassia auriculata flower extract (CFEt), at doses of 0.15, 0.30 and 0.45 g/kg body weight for 30 days, suppressed the elevated blood glucose and lipid levels in diabetic rats. Cassia auriculata at 0.45 g/kg was found to be comparable to glibenclamide.37

5) Cassia auriculata: Aspects of Safety Pharmacology and Drug Interaction studies on rats fed with standardized traditional hydro-alcoholic extract and technology-based supercritical extract of Cassia auriculata for 12 weeks. This study indicates that both these extracts are pharmaceutically safe and did not show any significant adverse reactions at the tested doses. The traditional hydro-alcoholic extract did not show any significant effect on pharmacokinetics; however, the technology-based supercritical extract caused a significant reduction in absorption of metformin.38

6) The insulin-receptor-binding effect of Cassia auriculata flower extract (CFEt) in streptozotocin induced male wistar rats, using circulating erythrocytes as a model system. The mean specific binding of insulin to erythrocyte receptors was significantly lower in diabetic control rats than in flower extract, glibenclamide treated diabetic rats, resulting in a significant decrease in plasma insulin. Scatchard plot analysis demonstrated that the decrease in insulin binding was accounted for by a lower number of insulin receptor sites per cell in diabetic control rats when compared with CFEt treated rats. The results suggest an acute alteration in the number of insulin receptors on ER membranes in streptozotocin-induced diabetic control rats. Treatment with CFEt (2.40 ± 0.15) improved specific insulin binding, with receptor number and affinity binding diabetic rats (0.95±0.06). These biochemical observations were supplemented by histopathological examination of pancreas section.39

7) Isozyme diversity in Cassia auriculata Linn done on seeds from fourteen different localities were collected all over India and nine enzymes were screened by native polyacrylamide gel electrophoresis (PAGE) technique and thirty-four putative loci were totally detected. Cluster and factor analyses indicated that there are two major distinct groups or clusters, and thus, seeds collected from a few different localities are enough to capture the genetic variation held by this species. Also isozyme analysis is a reliable, efficient and effective marker technology for determining genetic variations in Cassia auriculata.40

8) Total ten amino acids were present in the Leaves of Cassia auriculata Linn. Among these amino acids the LLeucine, D-Threonine, DL-Isoleucine methionine are essential amino acids whereas L-Cystine, DL-Alanine, Lproline, Glycine, Hydroxyproline, Aspartic acid, Lornithinehydrochloride are non essential amino acids.41

9) The beneficial effect of Tanner’s cassia (Cassia auriculata Linn) extract which prevents hemoglobin glycation and tail tendon collagen properties in streptozotocin (STZ) –induced diabetic rats. The effects of an aqueous extract of Tanner’s cassia and glybenclamide on plasma glucose, insulin, glycosylated hemoglobin and the collagen properties such as total collagen, extent of glycation, advanced glycation end product (AGE) linked fluorescence, lipid peroxidation (hydroperoxides), neutral salt, acid and pepsin soluble collagen were examined in tail tendon of control and experimental groups. Oral administration of Tanner’s cassia (0.45 mg/kg/bw) aqueous extract and glibenglamide to diabetic rats for 45 days significantly reduced blood glucose, glycosylated hemoglobin with increased level of insulin and prevented the abnormalities of tail tendon collagen properties. The results showed that Tanner’s cassia extract has antihyperglycaemic properties and prevents the abnormalities of collagen properties in tail tendon of STZ-induced diabetic rats. Tanner’s cassia extract administration is more effective than glibenglamide.42

CONCLUSION:
From above literature it is concluded that Cassia auriculata Linn. is responsible for the various therapeutic potentials especially in diabetes. It contains a number of phytoconstituents and amino acids. More research is needed to isolate the constituents responsible for the biological actions. There are very less clinical trial done on Avartaki. The literatures showed that the plant is very safe and effective for medicinal uses. So from this review of literature, it was concluded that the plant is having high medicinal value.

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