AYURPUB.com
INTERNATIONAL AYURVEDA PUBLICATIONS

REVIEW ARTICLE *ISSN 2456-0170*

KAKODUMBARA (*Ficus hispida* L.*f*.) – A PRAGMATIC REVIEW

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ABSTRACT

Kakodumbara is an uncelebrated medicine in the present time. The botanical source is *Ficus hispida* L.f., which rightly gives an idea about the hirsute nature of this Fig. Ethnomedically *Kakodumbara* have been used in the treatment of various diseases like, vitiligo, ulcers, psoriasis, hepatitis, dysentery and purgative. *Kakodumbara* (Hairy Fig) has been mentioned in *Brihatrayees* as well as in *Nighantus* (Lexicons) in the treatment of *Shwitra* (Leucoderma), Menorrhagia and Bleeding disorders. *Kakodumbara* contains wide varieties of compounds like alkaloids, flavonoids, phenols, carbohydrates, proteins, sterols, phenols and terpenes. Few of the traditional medicinal values attributed to *Kakodumbara* have been established through various research works. Its useful part is Fruit which is not taken other than medicinal purpose. The present review is an effort to give a detailed account of review on Ayurveda literature, Botanical description and Powder microscopy.

KEYWORDS: *Kakodumbara*, Ayurveda, *Ficus hispida*

INTRODUCTION

Over Centauries plants have been used as medicine by the Mankind. Few medicinal plants are yet to be explored completely. *Kakodumbara* is a tree found in wild, fruits resembling fig fruit but more hairy as the botanical name (*Ficus hispida*L.f.) suggests and is distinguished from other Ficus species because of the presence of opposite leaves as the synonym *Ficus oppositifolia* Roxb. propose. In the classical texts of Ayurveda, *Kakodumbara* is mentioned in the treatment of *Switra* (Leucoderma), *Vrana* (Wounds), *Kushta* (Skin diseases), *Daha* (Burning sensation), *Atisara* (Diarrhoea) and *Raktapitta (*Bleeding disorders). This drug is yet to be explored for its wide range of utilities. Hence in this article an attempt is made to review on *Kakodumbara* from different classical texts with special reference to Pharmacognosy.

AYURVEDA LITERARY REVIEW

ONOMATOLOGY

The word *Kakodumbara* means *kakanam hrisvodumbara* (small fig fruit which is eaten by crows)[1].The word Ficus in Latin refers to Fig, Fig tree; Hispida is a derivation of Latin word 'hispidus' which means hairy or bristly[2].

SYNONYMS OF KAKODUMBARA[1,3]

Katina (Fruits are hard)
Kharapatri (Leaves are scabrous)
Jaghanephala (Fruits appears on the trunk)
Phalabharika (Fruits appears in bunches)
Rajiphalgu (Fine streaks on Fruits)
Switrabheshaja (Medicine for Leucoderma)
Kushtaghni (Cures Skin diseases)

CHRONOLOGICAL LITERARY REVIEW

1. In *Brihattrayee*, In the context of *Shwitrachikitsa Kakodumbaraphala rasa* along with *guda* is mentioned[4,5,6].
2. In *Chakradatta*, *Kakodumbaraphala* is mentioned in *Raktapitta Chikitsa*[7]
3. In *Yogaratnakara Kakodumbaraphala rasa* is mentioned in the treatment of *Asrigdhara* and *Kakodumbara* is included in the treatment of *Pradara*[8].

GANA/VARGA`

Table No.1: Showing Gana/ Varga

Classical Text	***Gana/Varga***
Charaka Samhita[4]	*Sramahara*
Bhavaprakasha	*Vatad ivarga*
Dhanwantari nighantu[10]	*Amradi varga*
Kaiyyadeva Nighantu[11]	*Oushadi varga*
Madanapala Nighantu[12]	*Vatadi varga*
Raja nighantu[13]	*Amradi varga*
ShodalaNighantu[14]	*Amradi varga*

RASA PANCHAKA[11]

Rasa – Kashaya, Madhura

Guna – Guru

Veerya – Sheeta

Vipaka – Madhura

Doshaghnata – Tridoshajit

Karma –Tarpana, Brihmana, Grahi, Vishtambhi, Asrajit

Rogaghnata- Kshata, Daha, Vishaghna

TAXONOMICAL CLASSIFICATION[2]

Table No.2: Showing Taxonomical Classification of *Ficus hispida* L. *f.*

Kingdom	**Plantae**
Division	Angiosperms
Class	Eudicots
Order	Rosales
Family	Moraceae
Tribe	FiceaeDumort.
Genus	Ficus L.
Species	Hispida
Scientific Name	*Ficus hispida L.f.*

VERNACULAR NAMES[15]

English: Hairy Fig

Kannada: *Kaduatthi*

Tamil: *Ottannalam, Peyatti*

Telugu:*Boddamatti, Kakamedi*

Malayalam:*Erumanakku, Peyatti*

Hindi:*Gobla, Kagsha*

Arab: *Tinebarri*

BOTANICAL DESCRIPTIONS[16]

Habit - A shrub or small tree, all parts more or less hispid- pubescent; internodes hollow. Leaves – usually opposite, petiolate, membranous, 10-30 by 5-15 cm, ovate, oblong or subovate, apiculate or shortly and abruptly acuminate, toothed or entire, the lower surface hispid-pubescent, the upper surface hispid-scabrid, base rounded, subcordate or subcuneate, petioles 1.3-3.8cm long, densly hispid; stipules 2 to each leaf, ovate- lanceolate.Receptacles – 1.3-2.5cm across, turbinate, obovoid or subpyriform, yellowish when ripe, slightly umbonate, hispid and sometimes with bracts scattered along the sides, on peduncles 5-15mm long in pairs from the axils of the leaves, or in fascicles from shortened tuberculated branches from the old wood, or in pairs or fascicles on elongate stipular bracteates sometimes leafy branches issuing from the larger branches and stem and often reaching to or even penetrating the soil; basal bracts 3.Male Flowers – rather numerous, near the apex of the receptacle containing the galls. Sepals 3, concave, hyaline.Stamen 1; another broad; filaments short.Gall Flowers – pedicellate.Perianth 0. Ovary – smooth, globose; Style short, subterminal; stigma dilated.Fruit – ovoid , globular or pear shaped, shriveled, greyish brown colored, sychonium, developing from

an entire hypanthodium inflorescence, measuring 1.0 to 2.5cm in diameter, surface rough and granular, surrounded by small bracts at the top around the centrally located orifice and a small stout pedicel at the base, the fleshy part, the hollow receptacle , internally is studded with numerous achenes. The achenes are ovoid, glabrous, straw colored to brown colored and about 1.5 to 2.0mm in length

Flowering and Fruiting Time

PHARMACOGNOSY[17]

Macroscopic Characteristics:

FRUIT: 1.3-2.5cm across, turbinate, obovoid to subpyriform, slightly umbonate, hispid with bracts scattered along the sides on peduncles 5-15mm long in pairs from the axils of the leaves.

Microscopic Characteristics:

TS of fruit is circular to oval in outline, encircled by hairy epidermis, shows a small orifice at top and pedicel at base. The fleshy receptacle traversed with lactiferous vessels and vascular strands. It is internally studded with plenty of fruitlets, leaving a hollow in the centre.

Powder Microscopy:

Ficus hispida L.f.

Fruit Powder: Light Brown color, Rough to touch, Smell nauseous, Bitter in taste

Procedure: Powder treated with chloral hydrate and water observed under the microscope following fragments of tissues were observed.

Observation: Shows trichomes, attached with the cells of the epidermis or their broken fragments scattered as such throughout; they are both simple and glandular, the latter being very few, and clavate. Simple Trichomes are (1) unicellular, short, straight or bent and warty. (2) long – thick walled, and with bulbous base**, rosette crystals of calcium oxalate** scattered as such or embedded in the parenchymatous cells of the receptacle. Longitudinally cut fragments of annular vessels and fragments of lignified, thick-walled, pitted scelerids in surface view from achene.

Plate No.1 : Showing Powder Microscopy of *Ficushispida*L.f(Fruit)

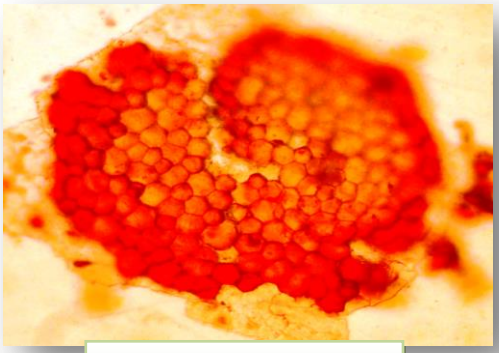

Fig No. 1: Endosperm

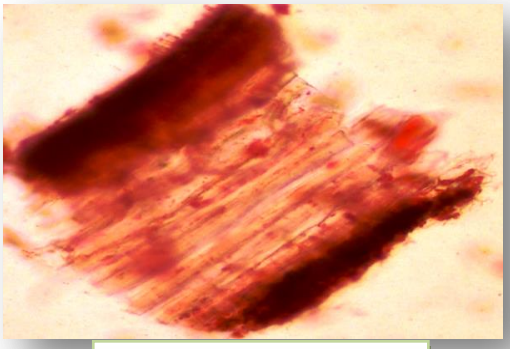

Fig No.2: Spathe of Stalk

Fig No.3: Thick walled Trichome

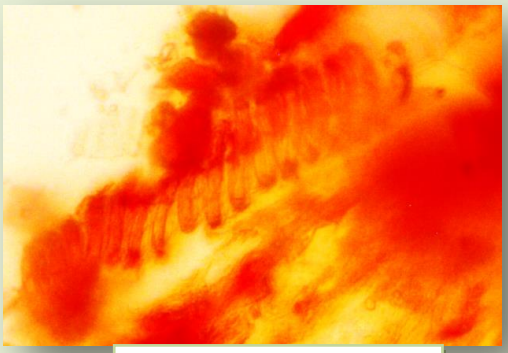

Fig No.4: Spiral vessel

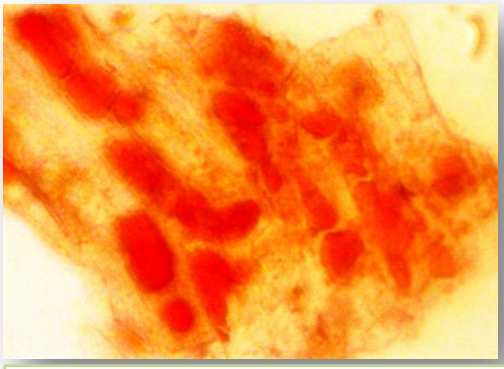

Fig No.5: Rosette crystals of calcium

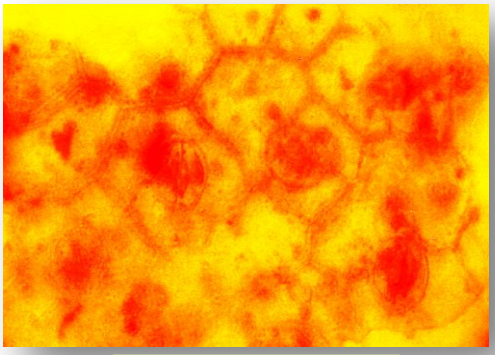

Fig No.6: Stomata

CHEMICAL CONSTITUENTS[18]

Table No.3: Showing Chemical constituents of different parts of *Kakodumbara*

Part	Chemical constituent
Bark	lupeol acetate, β-amyrine acetate, β-sitosterol, 10-ketotetracosyl arachidate
Leaves	6-O-methyltylophorinidine and 2-demethoxytylophorine, and a novel biphenylhexahydroindolizinehispidine , phenanthroindolizidine alkaloid, *n*-alkanes, coumarins, and triterpenoid, hispidin, oleanolic acid, bergaptine, β-amyrine, and β-sitosterol
Fruit	linalool, linalool oxide, terpeneol, and 2,6-dimethyl-1,7-octadiene-3,6-diol,

PHARMACOLOGICAL ACTIVITY BASED ON RESEARCHES[19,20,21]

Table No.4: Showing Research works on *Ficushispida*L.f.

Research Title	Part Used	Result
Evaluation of Nephroprotective Activity of Fruits of *Ficu shispida* on Cisplatin-Induced Nephrotoxicity	Fruits	methanolic extract showed significant nephroprotective activity than nephrocuration on cispaltin induced nephrotoxicity.

Antinociceptive Activity Studies with Methanol Extracts of *Ficus Hispida* L.f. Leaves and Fruits in Swiss Albino Mice	Leaves and Fruits	Both leaf and fruit extract of *Ficus Hispida* contain strong antinociceptive components
In vitro Cytotoxicity and Apoptotic Assay in HT-29 Cell Line Using *Ficus hispida* Linn: Leaves Extract	Leaves	*F. hispida* for the cell viability against HT-29 cell line at varying concentration ranges of 0 µg, 15 µg, 31 µg, 62 µg, 125 µg, and 250 µg. The end result showed that HT-29 cell viability decreases in a concentration-dependent manner

DISCUSSION AND CONCLUSION

Kakodumbara (Ficus hispida L.f) is wildly found throughout India, and its description can be traced from almost all Ayurveda classical textbooks and *Nighantus* (Lexicons). The Fruit is considered as inedible but possess many therapeutic properties with momentousness to *Switra* (Vitiligo) especially. The *Tridoshahara* and *Vishaghna* property of *Kakodumbar*a makes it inestimable among the medicinal plants. Few important pharmacological activities are proved but this drug is yet to be explored completely. Recent research reports suggests the strong cytotoxic activity of Kakodumbara. Hence, differentstudies has to be taken up to rediscover the wide ranged utility of the drug to fulfill the need of today's health research.

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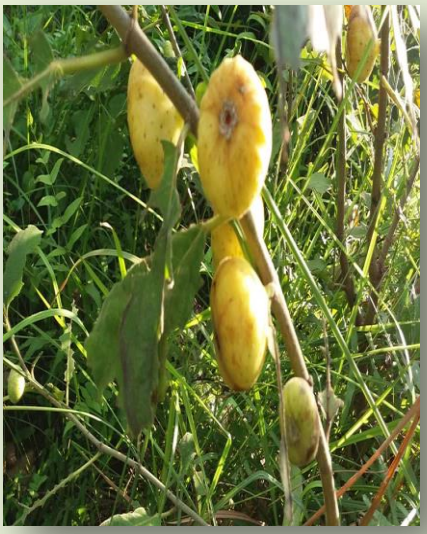
Source of support: Nil,
Conflict of interest: None Declared

Cite this article as
Aathira Sreekumar: Kakodumbara (Ficus Hispida L.F.) – A Pragmatic Review ayurpub; IV(5): 1352-1358

Ficus hispida L.f. tree

Unripe fruits of *Ficus hispida L.f.*

Section of *Ficus hispida L.f.* fruit



Ripe fruits of *Ficus hispida L.f.*