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Literary Review on *Kebuka* [*Costus speciosus* (J.Koenig) Sm.]

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ABSTRACT

Introduction: The plant *Kebuka* a is a perennial herb used in Indian systems of medicine and is widely used in folklore medical practice throughout the world. *Kebuka* (*Costus speciosus* (J.König) Sm.) belonging to the family Costaceae, is one among the plants described under *Shaka Varga* (Group of vegetables), a sub-group of *Ahara varga* (Group of eatables) as mentioned in classical treatises of Ayurveda. **Aim:** To obtain a comprehensive review on *Kebuka* (as a medicinal plant) from Ayurvedic scriptures and Ethnomedicinal use of the plant. **Results:** Various names have been attributed to it in the classics. The single use of the drug and its use in compound formulations is mentioned in *Brhattrayi* and *Nighantus* of *Ayurveda*. The drug shows wide application under ethnomedicinal practices. **Conclusion:** Through the review, the medicinal aspects of the drug were understood as mentioned in Ayurveda classics and from ethnomedicinal uses. Since the drug is widely distributed and easily available in the most parts of Indian subcontinent, further pre-clinical and clinical research on the drug is required to establish the therapeutic efficiency and it's mechanism of action in various disorders.

Key words: *Ayurveda, Kebuka, Costus speciosus, Spiral flag, ethnomedicine*

INTRODUCTION

Medicinal plants have always been of a great importance to the health care sector, for the needs of an individual. The healing powers of traditional herbal medicines have been realized since antiquities. About 65% of the world population has access to local medicinal plant knowledge system. India is sitting on a gold mine of well-recorded and traditionally well practiced knowledge of herbal medicine. India has an officially recorded list of 45,000 plant species and estimation put the list of 7500 species of medicinal plants growing in its 16 agroclimatic zones under 63.7 million hectares of forest coverage.[1] With an ever-increasing global inclination towards herbal medicine, there is a high demand for a huge raw material of medicinal plants. Medicinal herbs are moving from fringe to mainstream use with a greater number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals.[2]

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RESULT

Botanical Source: *Costus speciosus*

Family: Costaceae

Synonyms[3,4]

Kemuka, Kembuka, Peculā, Pelu, Peluni, Dalashālini, Kebuka, Kevuka, Kesura[5]

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Vernacular names

English	Spiral flag
Hindi	Keu, Keukand, Kemua
Kannada	Kuntige gidda, Kundige gidda, Benne kundige, Arati kundige
Marathi	Penva, Pinnham Kobee
Gujarati	Paskarmula, Valakdi
Telugu	Kashmeeramu, Cengalvakostu
Tamil	Kostam
Malayalam	Channakoova
Bengali	Keu, Keumut
Assamese	Tara
Oriya	Kudho, Chittorokudho

Habitat[6,7]

The herb is commonly found throughout India up to an altitude of 1200m in moist undergrowth, commonly along roadsides, streams and in wastelands. It is distributed in the Himalayas including Siwalik range, Bihar, Orissa, Uttaranchal, Bengal and in some part of Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Karnataka, Andhra Pradesh, Kerala etc. Distributed in Indo-Malaysia, Sri Lanka, Malay Islands and China.

Part Used: Root and Rhizome

Morphology[8]

An erect plant 1.2-2.7 m. high; rootstock tuberous, insipid; stem sub-woody at the base. **Leaves** 15-30 by 5.7-7.5 cm., subsessile, spirally arranged, oblong or oblanceolate-oblong, acute or acuminate, often cuspidate, glabrous above, silky-pubescent beneath, base rounded; sheaths coriaceous; ligule 0.

Flowers white, numerous, in very dense spikes 5-12.5 by 3.8-7.5 cm.; bracts 2-3.2 cm. long, ovate, acuminate, often pungently mucronate, bright red; bracteole solitary below the calyx, 16 mm. long.

Calyx 3.2 cm. long; lobes 6 mm. long, deltoid-ovate, cuspidate. **Corolla**-tube as long as the calyx; lobes ovate-oblong, apiculate, the lateral lobes 3.5 by 1.3 cm., the dorsal 4 by 2 cm. Lip suborbicular, white with a yellow centre, 5 cm. and more in diam., concave, plicate, crisped, the margins sometimes meeting in the middle; disk pubescent and with a tuft of hairs at its base. **Stamen** 3.8-4.5 cm. long, with a tuft of hairs at the base of the filament; connective petaloid, 13 mm. broad, pubescent, produced into a glabrous appendage as long as the linear anther-cells. **Style** 3.8 cm. long, slender; stigma with a semilunar ciliate mouth. **Capsules** globosely 3-gonous, 2 cm. diam., red. Seeds black, with a white aril.

Flowering and Fruiting: July-February.[6]

Source – ALN Rao Ayurvedic Medical College, Koppa

Microscopic Description[9]

Root: The young root shows a single layer of epidermis followed by 8 to 9 layers of cortical isodiametric cells. The innermost layer is the endodermis which encloses a single layered pericycle and a polyarch stele. The central part is represented by xylem parenchyma which gradually becomes thick-walled and lignified. The sclerification start from the centre to the periphery. The cork cambium arises in the third layer of the cortex and forms a thin cork cambium of 3 to 5

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layers of cells and the epidermis finally gets ruptured. The endodermis becomes thick-walled at the inner tangential and radial walls. Tracheids are absent. The xylem vessels are elliptical to somewhat circular in T.S. and possess reticulate type of thickening. Some of the vessels have pointed tail like ends. The xylem fibres are slightly thin walled, pointed at both ends, rarely with forked or truncated ends and bear simple pits on their walls. The xylem, parenchyma are rectangular in shape, devoid of pits on their walls.

Rhizome

The T.S. of the young rhizome shows a single layer of epidermis followed by ground parenchyma in which vascular bundles are scattered. The ground parenchyma is filled with starch grains especially in the outer layer and the starch grains do not bear any striations. With the growth of the rhizome a cork cambium arises in the outer cortical layers which cut off 8 to 10 layers of cork cells. There is a distinct endodermis which limits the extent of cortical parenchyma. Within the endodermis the vascular bundles are more closely scattered in the ground parenchyma. The bundles start the formation of fibres which are slightly thickened and bear simple pits on their walls. All the vascular bundles are of the amphicribal type with phloem encircling the xylem strand.

Gana Vargeekarana

Charaka Samhita	Krimighna - Su. 4/15 Tikta Skandha - Vi. 8/143 Shāka Varga - Su. 27/96
Sushruta Samhita	Tikta Shāka Dravya - Su. 46/263
Ashtanga Hrdaya	Tikta Shāka Dravya - Su. 6/79
Ashtanga Sangraha	Tikta Shāka Dravya - Su. 7/105 Krimighna Mahakashaya - Su. 15/20
Bhava Prakash Ni.	Shāka Varga
Kaiyadeva Ni.	Aushadhi Varga
Siddhamantra	Kaphapittaghna Vātala Varga
Rāja Vallabha Ni.	Madhyāhnika paricheda
Shodhala Nighantu	Lakshmanādi Varga
Hrdaya Deepika	Eka nāma varga
Priya Nighantu	Shatapushpadi Varga Shāka Varga
Abhidhana Manjari	Shāka Varga

Rasa Panchaka

	Ch. [10]	Su. [11]	A.H & A.S. [12,13]	B.P. [3]	K.N. [4]	P.V.S. [14]	API [15]
Rasa	*Tikta*			*Tikta, Katu*	*Tikta, Katu, Madhura*	*Tikta Kashaya*	*Tikta*
Guna	-	*Laghu*	-	*Laghu*		*Laghu, Ruksha*	
Vīrya	*Shita*	-	*Shita*				
Vipāka	*Katu*	-	*Katu*				
Doshaghnata	*K-Phara*	*R-Phara*	*K-P hara* *V-kara*			*K-P hara*	
K=Kapha, P=Pitta, V=Vata, R=Rakta							

Prabhava: Garbhāshaya Sankochaka[14]

Karma/ Action[3,4] [12-16]

Dipana (stomachic), *Pāchana* (digestive) *Rochana* (appetizer), *Hrdya* (cardiotonic), *Grāhi* (absorbent), *Vrishya* (aphrodisiac).

Pharmacological action[6]

Antifertility, abortifacient, ecbolic, oxytocic, estrogenic, antimicrobial, antiviral, antifungal, anti-inflammatory, muscle relaxant, anticholinesterase, diuretic, CNS depressant, antiarthritic, hypotensive, cardiotonic, hypoglycemic, spasmolytic, bradycardiac.

Rogaghnata/ Indications[3,4] [10-15]

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Swāsa (asthma), *Kāsa* (cough), *Arochaka* (anorexia), *Prameha* (diabetes), *Kushtha* (skin diseases), *Jwara* (fever), *Rakta vikāra* (blood disorders), *Rakta pitta* (bleeding), *Bhrama* (giddiness), *Krimi* (helminthiasis), *Shlipada* (filariasis).

Formulation

Yoga	Use/ Reference
Saptacchadādi Yavāgu/ Kwātha	Kaphaja Mutrakrchra (Ch.Chi.26/57, A.H.Chi.11/12, A.S.Chi.13)
Vyoshādi Saktu	Santarpana vikara (Ch.Su.23/20, A. H.Su.14/25, A.S.Su.24/43)
Krimighna Kashāya	Krimi (Ch. Su. 4/15) (A.S.Su.15/20)
Ayaskriti	Kushtha, Prameha, Sthoulya, Shopha (Su.Chi.10/12, A.S.Chi.21)
Kulathādi Ghritha	Jeerna Jwara (A.S.Chi.2/15)
Khadirādi Vati	Sarva Mukharoga (Su.Ut.26/54)
Shatāvaryādi Uttara Basti	Mutraghāta (Su.Chi.13/16)

Posology[17]

Juice: 10-20ml

Powder: 3-6gm

Amayika Prayoga

1. Shlipada (Filariasis): *Kebuka Kanda Niryasa* (exudate) mixed with *Vida Lavana* and *Putikaranja* or *Putranjiva Swarasa* is consumed. (Su.Chi.19/62)
2. *Krimi* (Intestinal worms): *Kebuka Swarasa* (juice) with honey is taken. (Su.Ut.54/25, A.H.Chi.20/26, A.S.Chi.22/28)

Ethnomedicinal use[18,19,20]

The **rhizomes** are rich in starch and fibre, but are cooked and eaten. They are cooked into a syrup or a preserve which is considered wholesome, and fairly nutritious. They are sometimes substituted for ginger, though not as good. The boiled rhizomes are mucilaginous. The **rhizomes** are feebly astringent and considered tonic, anthelmintic, abortifacient, depurative and aphrodisiac. They are given in cold, cough, pneumonia, stomach troubles, rheumatism, dropsy, urinary diseases, and are used as antivermin and maggoticide. The juice of **fresh rhizome** is purgative; mixed with *Acorus calamus* Linn. it is applied in leprosy. In Meghalaya, the decoction of rhizomes and those of *Cyperus rotundus* Linn. and the bark of *Azadirachta indica* A. Juss. is given in jaundice. The **tender shoots**, when boiled in milk, make a good vegetable; they are given as fodder. They can be mixed with other fodders, and can be fed fresh, ensiled and as hay. The **leaves** along with those of *Pueraria lobata* (Willd.) Ohwi and coconut scrapings are ground and boiled and given in mental disorders. The **dried stem** and **leaves** are employed in preparing an *apong* or a rice-beer in Assam. The **bruised leaves** are applied in fevers. A decoction of the **stem** is used in fever. Its juice is given in dysentery and that of **tender shoots** is squeezed into eyes for eye diseases. **Root** is useful in catarrhal fevers, coughs, dyspepsia, worms, skin diseases, and snake bites. **Tuber** is cooked and made into a syrup or preserve which is very wholesome. The **plant** is used in fever, dropsy, cholera, phthisis. puerperal fever, bite of rabid jackal or dog; snake bite; skin diseases, diabetes; bronchitis and asthma; tuberculosis, blood purification, headache; astringent, purgative, tonic; anthelmintic and stimulant. Plant **juice** is used in earache. **Plant** and **rhizome** are used to cure filariasis. The **leaves** are used in scabies and on wounds; in mumps, fever; cough, asthma and for hair growth. The **stem** in used in burning sensation on urination; earache; pus formation, as maggoticide; on wounds; as germicide and for toothache. **Stem juice** is applied on blisters; scalp to cure redness of the eye due to traumatic affliction; on wounds and in eye troubles. **Bark** is used to treat jaundice. **Bark** and **leaf** are used against cholera and in stomach disorders. The **tuber** is used in piles, fever; indigestion; viral hepatitis, rheumatoid arthritis; cold and cough; high fever and severe headache; digestive troubles, constipation; dysentery; as abortifacient and for sterilization. **Tuber** and **stem** are given to cure urinary tract infection. The **rhizome** is used to treat blood in urine; rheumatic pain, as anti-vermin; for abortion; delirium, nausea and vomiting tendency during labour; to expel intestinal

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worms; in burning acidity; headache; leprosy; muscle cramp and muscle pain; chicken pox, bone disorders, digestion; snake bite; pus formation in ear; Parkinson's disease; skin diseases; asthma; fever; constipation, dropsy; earache; leukaemia; dysentery; strangury; dyspepsia; scabies, itches, stomach trouble; urinary troubles and to dissolve stones; in rheumatoid arthritis; bone pain; uterine diseases; bronchitis, inflammation, anaemia; filariasis; leucorrhoea; backache; cough; as tonic; astringent, purgative, depurative, stimulant, anthelmintic; lactagogue; hair tonic; on boils; as an antidote for dog bite and has female sexual stimulant property. **Rhizome juice** is used in leprosy; jaundice and filariasis. The **root** is used in asthma and to check pus formation in earache; in helminthiasis, as aphrodisiac; tonic; purgative; anthelmintic; astringent; in catarrhal fever. cough, dyspepsia, worms, skin diseases; urinary troubles; rheumatism; tonsillitis; snake bite; on wounds; cuts; in cold; fever; skin diseases; jaundice, red urine disease and body pain.

Adulterant and Substitute[6,9]

Mostly the rhizome pieces are found adulterated with stem pieces of same plant in market. Used as an adulterant of *Langali* (*Gloriosa superba). Kebuka* is considered as source plant for *Kushtha* – *Saussurea lappa* (English - Costus root) in South India.[21]

Toxicity

A study was carried out to study the sub-acute toxicity of the ethanolic extract of *Costus speciosus in male mice.* The research result showed that the administration of CSE at 275-1100 mg/kg/day for 90 d did not show any significant disturbance in all parameters, except for reductions of cholesterol and blood glucose levels of test animals ($p<0.05$). Thus, indicating the safety of Ethanolic extract of *Costus speciosus* as a candidate if standardized herbal medicine for male contraception.[22]

Result and Discussion

Thorough study and investigation of the drug *Kebuka* - *Costus speciosus* from the available literature – classical texts of Brihattrayi and 8 Ayurveda Nighantus, shows that classical texts of Ayruveda the plant is mentioned under 10 various synonyms out of which *Kebuka, Kemuka and Kembuka* are the most frequent. The plant serves as an important source for its therapeutic use and has wide application both in Ayurveda and ethnomedicinal practice. It's therapeutic application is mostly found in disorders such as *Krimi* (worm infestation), *Shlipada* (filariasis) and *Jwara* (fever) as well as in *Kāsa* (cough), *Shwāsa* (asthma), *Kushtha* (skin diseases), *Mutrakricchra* (urinary tract diseases), *Santarpana vikaras* (diseases due to over nourishment) and other disorders with primary involvement of *Kapha dosha*. It's therapeutic efficacy in the above disorders could be explained through it's *Tikta* (bitter) and *Katu* (pungent) *Rasa* (taste), *Sheeta* (cold) *Virya* (potency), *Laghu* (light) and *Ruksha* (drying) *Gunas* (properties). Since the drug is *Garbhāshaya Sankochaka* (abortifacient) it's usage should be avoided in pregnant, women suffering from infertility and menorrhagia.

Due to it's potent anthelmintic and purgative properties the drug could be considered as a drug of choice particularly for *Kirmi Roga Chikitsa* (treatment of worm infestations).

Conclusion

Current era of globalization of Ayurveda and growth of market of Ayurvedic drugs put newer challenges to the Ayurveda community and Ayurveda Drug Manufacturers, one of the most important is shortage of authentic raw drug materials. One of the solutions for this problem is to draw attention of Ayurveda researchers, practitioners and drug manufacturers to the less known and used, but authentic ayurvedic drugs which have no controversy in it's botanical identification, widely mentioned in classical texts and are easily available throughout Indian subcontinent. The drug *Kebuka*, botanically identified as *Costus speciosus,* is a perennial herb which is commonly found throughout India. Root and Rhizome are the therapeutically useful parts of the plant. The therapeutic efficacy of the plant is evident from both the classical texts of Ayurveda as well as from the wide spectrum of it's application in folklore medicinal

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practice. Since the drug *Kebuka* has no controversy in it's identification and is widely available throughout the country it deserves more attention from ayurvedic community in the form of pre-clinical and clinical research on the drug to establish it's safety dosage, therapeutic efficiency and mechanism of action and further wider implementation in clinical practice.

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