

REVIEW ON *THEV - COLOCASIA ESCULENTA* (LINN.) SCHOTT. : EMERGING LEGENDARY MEDICINAL PLANT

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ABSTRACT

Plants in the vicinity with therapeutic potentialities are highly beneficial for treatment modalities. Comprehensive literary knowledge and documentation is an aid to physician to develop best outcome in the service of humanity. *Thev - Colocasia esculenta* (Linn.) Schott. of family Araceae is commonly available throughout India in wet places. It is widely used by folklore practitioners in the treatment of Otagia, Otorrhoea, Asthma, Arthritis, Neurological and Skin disorders. References about the plant are available in *Samhita*, *Nighantu* and contemporary texts. Literary review material from *Samhita*, *Nighantu* and contemporary texts is collected along with its information in the relevant current textbooks and journals. The plant has been considered as botanical source for various *stha-vara dravya* mentioned in the classical literatures with diverse therapeutic potentialities. All parts of *Colocasia esculenta* (Linn.) Schott. is easily accessible, simple, safe and potent medicine in the treatment of different ailments.

Keywords: Vicinity, *Thev*, Review, Folklore.

INTRODUCTION

Plants have been an important source for medicinal purposes since time immemorial and traditional medicine is documented to be used by about 80% of world's population¹. *Ayurveda* advises the use of locally available drugs to manage the patients of that region. According to *Acharya Bhavamishra* the plants found in the surroundings are very much beneficial and potential in treating multiple diseases. Hence it is

necessary to collect the information of every single plant and evaluate its value as ethno-medicine.

One such familiar plant commonly available throughout India in wet places is *Colocasia esculenta* (Linn.) Schott. a member of Araceae family is called *Pindalu*, *Aluki* in Sanskrit, *Kesu* in Kannada and *Thev* in Tulu language. The whole plant is edible and used in *Tulunadu* (Coastal South India) to prepare many culinary

dishes like *Pathrode* (leaf pan cake), *Kesuvina gojju* (*Colocasia* stalk curry), *Kesuvina soppu chutney* (*Colocasia* leaves seasoned paste). The pressed juice of petiole of this plant is said to be effective in the management of Otaglia and Otorrhoea according to traditional usage mentioned in the literatures.²

Henceforth, this descriptive study is an effort made to review the reference of *Colocasia esculenta* (Linn.) Schott. in various *Samhita*, *Nighantu* and contemporary literatures.

MATERIALS AND METHODS

Source of data: The information about the plant with respect to its categorization, synonyms, morphology, properties and actions was compiled from various *Samhita*, *Nighantu*, contemporary textbooks, publications and journals.

RESULTS

It can be reviewed mainly under purview of *Veda & Purana*, Classical literatures and Contemporary textual.

Veda & Purana:

The plant *Thev - Colocasia esculenta* (Linn.) Schott. is not stated as a botanical source for any of the *dravya* mentioned in the *Veda* or *Purana*.^{3,4,5}

Classical literatures:

The plant is mentioned in *Charaka Samhita*^{6,7,8}, *Sushruta Samhita*⁹, *Bhela Samhita*¹⁰, *Bhavaprakasha Samhita*¹¹, *Ashtanga Sangraha*¹², *Ashtanga Hridaya*¹³ and *Bhaishajya Ratnavali*¹⁴ with various names such as *Pindalu*, *Aluka*, *Pindaluka*, *Aruvi* under *Shaka varga* for which *Colocasia esculenta* (Linn.) Schott. is stated as botanical source by recent authors. Various synonyms, morphology, properties and actions of this plant is explained in *Madanapala nighantu*¹⁵, *Bhavaprakasha nighantu*¹⁶, *Raja nighantu*¹⁷, *Saligram nighantu*¹⁸, *Priya nighantu*¹⁹, *Hridayadeepa nighantu & siddha mantra*²⁰ and *Nighantu adarsha*²¹. *Colocasia esculenta* (Linn.) Schott. was called by various names like *Pindaluka*, *Aluki*, *Aluka*, *Pindalu* etc in the *nighantu*.

Nirukti³⁸

Aaluki- Stri, *Deerghaakaara sookshma raktaluhu*.
Aalukam- Klee, *Aalu + Swartheakan*. *Moola visheshaha aalu iti bhaasha*.

Pindaluhu- Pum, *Pindavat sthoola aaluhu*.

Pindalukam- Klee, *Pindalurivapatikrutihi*.
Ivartheakan. *Aalu visheshaha*.

Refers to elongated or round shaped, smaller variety of tuber.

Synonyms

Synonyms mentioned in *Samhita*

Aluka^{6,9}, *Pindalu*^{6,10} and *Pindaluka*^{6,9,12,13} are mentioned in *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Sangraha*, *Ashtanga Hridaya* and *Bhela Samhita*,

Synonyms mentioned in *Nighantu*

Aluki^{16,18,19,21}, *Pindaluka*^{15,17,20}, *Shankalu*¹⁵ and *Raktalubheda*¹⁶ are mentioned in *Bhavaprakasha Nighantu*, *Madanapala Nighantu*, *Raja Nighantu*, *Shaligram Nighantu*, *Priya Nighantu*, *Hridayadeepa Nighantu & Siddhamantra* and *Nighantu Adarsha*.

Synonyms mentioned in Contemporary texts

Aluki^{22,35,27,36}, *Aluka*^{23,24}, *Pindaluka*³⁵, *Neeli*²³, *Raktalubheda*²³, *Alupam*^{24,33}, *Pindaruka*³⁴, *Kachvi*³⁶, *Kachuhu*³⁶, *Kandaruha*²⁴, *Chatrika*²⁴, *Prthunaalam*²⁴, *Prthuparna*²⁴, *Kundalika*²⁴, *Pinda*²⁴ and *Pindetara*²⁴ are mentioned in *Dravyaguna Vijnana*, *Guna Ratnamala*, *Medicinal Plants of India*, *A Lexicon of Medicinal Plants in India*, *Materia Medica of Ayurveda*, *Medicinal Plants used in Ayurveda*, *Vanoushadhi Chandrodya* and *Indian Medicinal Plants*.

Classical categorization

Madanapala Nighantu and *Priya Nighantu* have explained the plant under *Shaka varga*; *Bhavaprakasha Nighantu* and *Saligram Nighantu* have mentioned under *Kanda Shaka varga*. *Raja Nighantu* has considered the plant under *Moolakadi varga*; the plant has been mentioned under *Pittaghna varga* in *Hridaya Deepaka Nighantu and Siddhamantra* and under *Vachadi varga* in *Nighantu adarsha*.

Rasa panchaka according to different authors

Rasa

It possesses *Madhura rasa* as per *Guna Ratnamala*, *Indian Medicinal Plants (Guna Patham)* and *Review on Indian Medicinal Plants*, *Tikta rasa* as per *Raja Nighantu* and *Indian Medicinal Plants (Guna Patham)*, *Katu rasa* as per *Ashtanga Sangraha*, *Ka-*

shaya rasa as per Indian Medicinal Plants (*Guna Patham*) and *Lavana rasa* as per *Guna Ratnamala*.

Table 1: Guna

Books	Guru	Laghu	Rooksha	Snigdha	Sheeta	Ushna	Sara	Picchila
Su. S.	+	-	-	-	-	-	-	-
Bha.P.N.	+	-	-	+	-	-	-	-
R.N.	+	-	-	-	-	-	-	-
Sha.N.	-	-	-	+	-	-	-	-
P.N.	+	-	-	+	-	-	-	-
N.A.	+	-	-	+	-	-	-	-
P.V.S.	+	-	-	-	-	+	-	+
G.R.M.	-	+	+	-	+	-	+	-
V.C.	-	-	-	+	-	-	-	-
I.M.P. (Gu.Pa.)	+	-	-	-	-	-	-	-
R.I.M.P.	+	-	-	+	+	-	-	-
M.M.	+	-	-	-	-	-	-	-
M.P.A.	+	-	-	-	-	-	-	-

Su.S- *Sushruta Samhita*, Bha.P.N- *Bhavaprakasha Nighantu*, R.N- *Raja Nighantu*, Sha.N- *Shaligrama Nighantu*, P.N- *Priya Nighantu*, N.A- *Nighantu Adarsha*, PVS- *Priya Vrat Sharma*, G.R.M- *Guna Ratnamala*, VC- *Vanoushadhi Chandrodaya*, I.M.P.(Gu.Pa.)- *Indian Medicinal Plants (Guna Patham)*, R.I.M.P- *Review on Indian Medicinal Plants*, M.M.- *Materia Medica*, MPA- *Medicinal Plants used in Ayurveda*

Veerya

Ushna veerya according to *Ashtanga Sangraha* and *Priya Nighantu*; *Sheeta veerya* as per *Review on Indian Medicinal Plants*.

Vipaka

Madhura vipaka as per *Review on Indian Medicinal Plants*.

Table 2: Doshagnata

Books	Vatahara	Vatakara	Pittahara	Pittakara	Kaphahara	Kaphakara	Tridosahara	Tridoshakara
Su. S.	-	+	-	-	-	+	-	-
As.S.	+	-	-	+	+	-	-	-
P.N.	-	-	-	+	-	+	-	-
Bha.P.N	-	-	-	-	+	-	-	-
Sha.N.	-	-	-	-	+	-	-	-
N.A.	-	-	-	-	+	-	-	-
R.N.	-	-	-	-	-	-	-	+
G.R.M.	-	+	+	-	-	+	-	-
P.V.S.	-	-	-	+	-	+	-	-
M.M.	-	+	-	-	-	+	-	-
I.M.P. (Gu.Pa.)	-	-	-	-	-	-	+	-
M.P.I.	-	-	+	-	+	-	-	-
R.M.P.I	-	+	-	-	-	+	-	-
V.C.	-	-	-	-	+	-	-	-

Table 3: Karma

<i>Karma</i>	Bha. P.N.	P. N.	N. A.	P.V.S.	G.R.M.	MPA	VC	RIMP
<i>Vishtambha</i>	+	+	+	+	-	+	-	+
<i>Ruchikara</i>	+	+	+	-	-	+	+	-
<i>Balya</i>	+	+	+	+	-	+	+	+
<i>Malasthambhaka</i>	-	-	-	-	-	-	+	-
<i>Vrnashothahara</i>	-	-	-	-	+	-	-	-
<i>Raktasthambhaka</i>	+	-	-	-	-	+	-	+
<i>Viryavardhaka</i>	-	-	-	-	-	-	-	+

Adulterants/Substitutes³⁶

As per the Unani system, its *Pratinidhi dravyas* are *dalchini, lavanga, ajwain*.

Contemporary textual:

Distribution, morphology, medicinal uses of different parts, different vernacular names, varieties, chemical composition, cultivation, pharmacological studies, clinical studies, toxicological studies, phytography, phenology are detailed in various floras and contemporary literatures.^{22-27, 29-37}

Botanical source^{37, 39}

Botanical name- *Colocasia esculenta* (Linn.) Schott. (Synonym- *Colocasia antiquorum* Schott.) The generic name *kolokasion* is derived from the ancient Greek word, which meant the edible roots. In Latin, the specific epithet, *esculenta*, means "edible"; belonging to family Araceae.

Habit^{24, 37}

A large herb. Stem slightly swollen at the base of the leaf-sheaths, arising from a hard tapering rhizome. Tubers up to 15cm in diam. Leaves up to 50 x 30cm, ovate to suborbicular-cordate, apex rounded and usually apiculate, basal sinus triangular, dark green, sometimes clouded with black; Petiole erect up to 100cm long, lamina thinly coriaceous, peltate-ovate, cordate at the base, up to 50cm. long, with a triangular sinus cut one-third to half way to petiole, with a dull, not polished surface above, paler and coloured beneath, but rarely glaucous, green or violet. Peduncle much shorter than the petiole up to 50cm long; Spathe c.30cm long, tube oblong, green; limb yellow to orange, narrowly lanceolate, caudate-acuminate, never widely open, curved slightly backwards in flower; Spadix much shorter than the spathe, rather slender up

to 20cm long. Female inflorescence as long as the sterile male inflorescence. Appendix much shorter than the inflorescence, style very short. Stigma discoid.

Habitat^{15, 24, 25, 27, 30, 31, 33, 37}

Colocasia esculenta is a tropically grown plant and considered as one of the primitive cultivated plants. It was probably believed to be first native to the low and wetlands of Malaysia. It is estimated that it was being cultivated in wet tropical India before 5000BC. Apparently coming from Malaysia, and from India it was further on transported towards west to ancient Egypt, where it was portrayed by Greek and Roman historians as an important crop. In Kenya taro root is referred to as arrow root. In India, it is found in moist and shady situations inside forests, at an altitude of 2,440m. In Karnataka, it is common in wet and marshy places like Udupi and Dakshina Kannada district, also seen in places with cool weather like Chikmagalur, Coorg, Hassan, Mysore and Shimoga.

Taxonomy³⁹**Table 4:** Taxonomical classification

Kingdom	Plantae
Clade	Angiosperms
Clade	Monocots
Order	Alismatales
Family	Araceae
Genus	<i>Colocasia</i>
Species	<i>C. esculenta</i>

Folklore use^{24, 25, 26, 27, 29, 30, 31, 33, 36}

Ethno botanical studies have reported that the plant is used in atrophy, emaciation or cachexia, wounds, cough, bronchitis, anthrax, in heart problems, high

blood pressure and dropsy. All the parts of the plant are acrid, which is attributed to the presence of calcium oxalate crystals in the tissues. The acidity is removed by boiling and by addition of baking soda. In Asia and Africa, this species is also used in traditional medicine to treat arterial hypertension, liver problems, ulcers, snakebites, and rheumatism. Leaves are used in fever, for pain, to prevent stone formation in the urinary tract, to arrest frequent urination and on boils and abscess. The tubers and leaves are a common vegetable in India. They were found to be satisfactory as a source of dietary fibre for diabetics helping in lowering their post-prandial blood glucose level. It has been recorded as an aphrodisiac in Ishaq ibn Murad's manual of Turkish medicine. Used as an anthelmintic, given to eradicate small worms of the stomach and its extract is used in nose ulcers and warts. Pressed juice of the petioles is styptic, used as an astringent and to arrest arterial haemorrhage. It is used in ear ache and otorrhoea and also as an external stimulant and rube-facient. The juice expressed from the leaf stalks of black species is used with salt as an absorbent in cases of inflamed glands and buboes. The exudate and the juice of stalk is applied on bee sting, wounds and cuts. The paste of the petiole is used as lactagogue, in gynaecological disorders and joint pains. The juice from the petiole is used in boils and skin eruptions. Fibre obtained from the leaf stalk has been used for plaiting. The juice of the corm is used in cases of alopecia, internally it acts as a laxative, and is used in cases of piles and congestion of the portal system, for pregnancy, also as an antidote to the stings of wasps, in scorpion sting and other insects. Corm is used for general debility, as tonic, in rickets, as vermifuge, in dysentery, snake bite, in rheumatism, as an ointment for burns and on wounds and injuries as haemostatic, in diabetes and to check helminths.

Vernacular names²⁸

It is termed as *Aluki*, *Alupam*, *Alukam*, *Pindaluka*, *Pindalu* in Sanskrit; *Pattarveli*, *Aruvi*, *Arayi*, *Dhuyiya*, *Kacchu* in Hindi; *Taro*, *Dasheen*, *Eddo*, *Cocoyam* in English; *Kesu*, *kesavedantu*, *shame gadde* in Kannada; *Thev*, *sev* in Tulu; *Chempakizhanna*, *Kaladi* in Malayalam; *Shimelam*, *Shamakkilangu*, in Tamil;

Chamagadda in Telugu; *Aalu* in Marathi; *Kaachu* in Bengali; *Alavi* in Gujarat; *Allum* in Konkani; *Kachalu* in Punjabi; *Saru* in Oriya.

Types²⁵

Two varieties are found in Bombay Presidency- one with dark purple stalks and leaves the other in which these are green.

Method of propagation²⁹

To crop *C. esculenta*, the tops of the tubers are cut off and are replanted.

Flowering and fruiting^{33, 37}

It flowers during August-November and bears fruits throughout the year.

Parts used^{25, 30}

Petioles or leaf stalks, Leaves and Corms.

Chemical composition^{24, 26}

The stem of black and green variety was reported to possess protein, fat, fibre, carbohydrates, calcium, phosphorus, iron, thiamine, nicotinic acid, riboflavin, vitamin C, carotene, vitamin A. Tubers contain much starch, total amino acids, Vit B, Vit C, Carotene, Sapotoxin, Calcium and Phosphorous. They also contain 73.1% moisture, 3.0% protein, 0.1% fat, 1.7% minerals, 22.1% carbohydrates and mucilage. It causes itching because of the presence of Calcium oxalate. The leaves were found to contain flavones, apigenin, luteolin and anthocyanin, oxalates, hydrocyanic acid, phytic acid, and phosphorus.

Culinary^{15, 21}

In **India**, *Colocasia esculenta* (L.) Schott. is commonly used for preparation of dish served in many ways. In the Western coast of India, tall-growing variety of *Colocasia* is extensively used to make *Patrode*, *Patrade*, or *Patrada*, literally a "leaf-pancake". In Dakshina Kannada and Udupi districts of Karnataka state, different parts of the plant are used in the preparations such as *Kesavina gojju* (stalk curry), *Kesavinavele chutney* (seasoned paste) and confectionaries from the corm.

Safety aspects³¹

LD₅₀ of 6000mg/kg bodyweight in the *C. esculenta* leaves extract indicates that the extract may probably be non-toxic and rendered safe for consumption.

Pharmacology³¹

The drug is proven to possess various activities such as Antihyperlipidaemic, Anti-inflammatory activity, Antimicrobial activity, Antifungal, Anthelmintic, Haemagglutinating, Insecticidal activity.

Clinical study³¹

Antihyperglycaemic –

Effect of feeding different levels of fibre (25, 50 and 75g) obtained from the leaves was studied in comparison with control diet and purified vegetable fibre diet (75g isabgol) in 8 healthy volunteers and 6 non-insulin dependent diabetic patients. It was observed that incorporation of fibre in the diet of diabetics significantly reduced the post prandial blood glucose levels.

DISCUSSION

It is a wonderful step if plants in the vicinity, commonly available, are used for the therapeutic benefits. This also assures cost effectiveness. Thus proving the therapeutic efficiency of locally available plants adds to the contribution to the science aiming in modifying the disease pathology and to prevent its complications. *Colocasia esculenta* (Linn.) Schott. a member of Araceae family is commonly known as *Pindalu*, *Aluki* in Sanskrit, *Kesu* in Kannada and *Thev* in Tulu language. It is a very familiar plant available throughout India in wet places and cultivated throughout the hotter parts of India. The pressed juice of petiole of this plant is said to be effective in the management of Otagia and Otorrhoea according to traditional usage mentioned in the literatures.

The plant *Thev - Colocasia esculenta* (Linn.) Schott. is not stated as a botanical source for any of the *dravya* mentioned in the *Vedic* literature and *Puranas*. Classical *granthas* like *Charaka Samhita*, *Sushruta Samhita*, *Bhela Samhita*, *Ashtanga Sangraha* have mentioned the *dravya* named as *Pindalu*, *Aluka*, *Pindaluka* under *Kanda shaka varga* which is identified as *Colocasia esculenta* (L.) Schott by the recent authors.

Nighantus like *Madanapala nighantu*, *Bhavaprakasha nighantu*, *Raja nighantu*, *Saligrama nighantu*, *Priya nighantu*, *Hridayadeepaka nighantu* & *Siddhamantra*, *Nighantu adarsha* have equated *Pindaluka*, *Aluki*,

Aluka to *Colocasia esculenta* (L.) Schott. Most of the *nighantu* have explained this drug under *Kanda shaka varga* along with their properties. Varied opinion of *Rasa panchaka* can be found in the classical literatures.

Distribution, morphology, medicinal uses of different parts, different vernacular names, varieties, chemical composition, cultivation, pharmacological studies, clinical studies, toxicological studies, phytophany, phenology are detailed in various floras and contemporary literatures. Pharmacologically, it is proved to be having Anti-bacterial, Anti-fungal, Anti-inflammatory, Analgesic, Anti-hepatotoxic, Antimicrobial activity. Clinically proven that it is Antihyperglycaemic. The chemical composition of stem of black and green variety was reported to possess protein, fat, mineral matter, fibre, carbohydrates, calcium, phosphorus, iron, thiamine, nicotinic acid, riboflavin, vitamin C, carotene, vitamin A. It is extensively used on the Western coast of India to make several dishes named *Patrode*, *Patrade* or *Patrada*, literally a leaf pancake.

CONCLUSION

Based on the above descriptive study, it can be concluded that all the parts of *Thev - Colocasia esculenta* (Linn.) Schott. is beneficial for the therapeutic purpose and dietary use. It will be effective in Otagia, Otorrhea, General debility, Burns, Wounds, Helminths etc. As it is already considered safe for human consumption, this plant can be taken up for extensive studies to prove efficacy and provide a scientific base in *Ayurveda*.

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