

LITERARY REVIEW ON KOKILĀKSHA - *HYGROPHILA AURICULATA* (SCHUMACH.) HEINE

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<https://doi.org/10.46607/iamj1610052022>

(Published Online: May 2022)

Open Access

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Article Received: 13/04/2022 - **Peer Reviewed:** 27/04/2022 - **Accepted for Publication:** 28/04/2022

**ABSTRACT**

Introduction: The plant Kokilāksha is an annual herb used in Ayurveda and other Indian systems of medicine as well as in Folklore medical practice. Kokilāksha is botanically identified as *Hygrophila auriculata* (Schumach.) Heine, belonging to the family Acantheaceae and is commonly available almost all over the country in waterlogged places. The plant is described as having wide therapeutic action and application in Ayurveda classics, but in spite of its wide availability and extensive mentioning in Ayurvedic texts, no comprehensive literary review is done so far on the plant. **Aim and Objective:** To obtain a comprehensive review of Kokilāksha -*Hygrophila auriculata* (Schumach.) Heine (as a medicinal plant) from Ayurvedic scriptures and Ethnomedicinal uses of the plant and to resolve a few minor controversial points regarding its suggested identification with various Sanskrit synonyms. **Result:** Thorough review of the drug Kokilāksha was done from the Ayurveda literature including Brhat-trayi and 17 Nighantus regarding its medicinal properties, application in various diseases, and usage in compound formulations along with the compilation from ethnomedicinal practice. **Conclusion:** The plant serves as an important source for its therapeutic use. Since the drug is widely distributed and easily available throughout the country, further experimental, pre-clinical, and clinical research on the drug is required to establish the therapeutic efficiency and mechanism of action in the mentioned disorders.

Keywords: Ayurveda, Kokilāksha, Tālmakhana, Vājīkarana, Ethnomedicine

INTRODUCTION

Medicinal plants have been used by humanity long before the prehistoric period for healthcare services. The ancient scholars believed that herbs are highly potent to cure various health-related problems and internal diseases which are otherwise considered difficult to cure. WHO estimated that 80 percent of people worldwide rely on herbal medicines for some aspect of their primary health care needs. According to World Health Organization, around 21,000 plant species have the potential for being used as medicinal plants. *Aushadha* (medicinal plant) in Ayurveda has been given prime importance as it is one among the *Trisutra* i.e., three main divisions of Ayurveda: *Hetu* – causes, *Linga* – clinical features, and *Aushadha* – remedy. *Aushadha* is that which has the potential to bring about the reversal of the process of pathogenesis (*samprapti vighatana*) and eradication of the disease. *Kokilāksha* is one of the herbs widely available in India. It consists of a dried whole plant of *Astercantha Longifolia* Nees. Syn. *Hygrophila Spinosa* T. Anders (Fam. Acanthaceae); It is a spiny, stout, annual herb, commonly available in waterlogged places throughout the country. The plant is used as a whole or its *Moola* (root) or *Beeja* (seed) specifically. The authors have tried to compile a therapeutic review of the plant

from Ayurveda texts. This review gives a view on the synonyms, partly used, morphology, references from *Nighantus*, *Rasa panchaka*, therapeutic action, formulations, and the ethnomedicinal practice of the drug *Kokilāksha* and the controversial aspect in the identification of the plant concerning its synonyms.

Botanical Name: *Hygrophila auriculata* (Schumach.) Heine syn. *Astercantha longifolia* Nees, syn. *Hygrophila spinosa* T. Anderson

Family: Acanthaceae

Synonyms/ Paryaya

The synonyms of the drug *Kokilāksha* are compiled from *Kaiyadeva Nighantu* (KN)¹, *Bhāvaprakāsha Nighantu* (BpN)², *Madanapāla Nighantu* (MpN)³, *Dhanwantari Nighantu* (DN)⁴, *Rāja Nighantu* (RN)⁵, *Amarakosha* (AK)⁶, *Ashtānga Nighantu* (AN)⁷, *Paryāya Ratnamala* (PR)⁸, *Shabdachandrika* (SC)⁹, *Hrdya Deepika Nighantu* (HD)¹⁰, and from Commentaries of Dalhana (Dlh) - (Su.Chi.26/33; Su.Ut.42/112) on Sushruta Samhita, Chakrapāni (CP) - (Ch.Su.4/17,20; Ch.Chi.2.1/24; Ch.Chi.2.4/23; Ch.Chi26/62) on Charaka Samhita and Indu - (A.S.Ut.50/25; A.S.Ut.50/59) on Ashtanga Samgraha, which is represented in Table 1.

(Table 1)

	KN	BpN	MpN	DN	RN	AK	AN	PR	SC	HD	Dlh	CP	Indu
<i>Kokilāksha</i>	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ikshura</i>	+	+	+	+	+	+		+	+	+	+		
<i>Ikshuraka</i>							+				+	+	+
<i>Kshura</i>	+	+	+			+			+	+			
<i>Kshuraka</i>	+	+			+			+					
<i>Ikshuvālika</i>			+								+	+	+
<i>Ikshubālika</i>	+	+		+									
<i>Ikshugandha</i>		+		+	+	+			+				
<i>Ikshugandhika</i>	+		+										
<i>Kandekshu</i>		+				+			+				
<i>Bhikshu</i>	+	+											

(Table 1) mentions synonyms that are common between various authors.

In addition to that, the authors give the following unique synonyms as mentioned in (Table 2):

(Table 2)

KN	<i>Dhwanksha, Kadambashali, Brhatkeshha, Khaggala, Tailaghantika</i>
BPN	<i>Kakekshu</i>
AN	<i>Adhyanda, Sthulakantaka</i>
DN	<i>Kharakashali</i>
PR	<i>Virataru, Chatraka, Atichatraka</i>
MpN	<i>Kshurakodha, Tailakatoti, Ikshu</i>
RN	<i>Shrigali, Shrinkhala, Ranaka, Pichila Shringalaghanti, Vajrasthi, Shrinkhala, Vajrakantaka, Vajra, Shrinkhalika, Peekekshana</i>
Dlh	<i>Talamakhana, Itkata, Khaggali, Virataru</i>
Indu	<i>Karankashali, Karmabhashali, Adhyanda, Tailakantaka</i>
CP	<i>Khagalika, Chatra, Atichatra, Khaggalika, Indra</i>

Table 3: Vernacular names

English	Long leaved barleria
Hindi	<i>Talmakhanna, Kantakaliya, Gokulakanta</i>
Kannada	<i>Kolavali, Kolarind, Kolavankal</i>
Marathi	<i>Talikhana, Kalsunda</i>
Gujarati	<i>Ekharo, Gokhru</i>
Telugu	<i>Kuilirakha, Nirguviveru</i>
Tamil	<i>Golmidi, Nirguvireru, Nerugobbi</i>
Malayalam	<i>Yayalculli, Culli, Nirmuli</i>
Urdu	<i>Talmakhana</i>
Bengali	<i>Kuliyakhara, Kantakalika</i>

Part Used¹¹ – *Panchānga* (Whole plant), *Moola* (Root), *Beeja* (Seed).

Habit^{11,12} It is common in waterlogged places such as banks of the tanks, ditches, paddy fields, etc. throughout the country.

Morphology¹¹

Root - Mostly adventitious, whitish to brown; no characteristic odor and taste.

Stem - Usually unbranched, fasciculate, sub-quadrangular, swollen at nodes, covered with long hairs which are numerous at the nodes, externally greyish brown, creamish brown on cut surfaces, no characteristic odour, and taste.

Leaf - Greenish-brown, 1-7 cm long, 0.5-1 cm wide, subsessile, lanceolate, acute, entire, and hairy.

Flower - Yellowish-brown, usually occurring in apparent whorls of eight (in 4 pairs) at each node; bracts about 2.5 cm long, with long white hairs; calyx 4-partite, upper sepal 1.6-2 cm long, broader than the other three, which are 1.3 cm long, all linear-lanceolate,

coarsely hairy on the back and with hyaline ciliate margins; corolla 3.2 cm long, widely 2 lipped, tube 1.6 cm long, abruptly swollen at the top; stamens 4, didynamous, second pair larger; filament quite glabrous; anthers two-celled, subequal, glabrous; ovary two-celled with 4 ovules in each cell; style filiform, pubescent; stigma simple, involute with a fissure on the upper side.

Fruit - Two celled, linear-oblong, compressed, capsule about 0.8 cm long, pointed, 4- seeded.

Seed - Ovate, flat or compressed, truncate at the base, 0.2-0.25 cm long and 0.1 - 0.15 cm wide, hairy but appearing smooth; when soaked in water immediately get coated with mucilage, light brown; taste slightly bitter and odour not distinct.

Microscopic Features¹¹

Root - Root shows a single-layered epidermis of thin-walled, rectangular to cubical, parenchymatous cells having unicellular hairs; 2° cortex composed of round to oval or oblong, thin-walled cells having large

intercellular spaces; most of these cells divided longitudinally and transversely with walls forming 4-6 or more chambers; size of these cells and intercellular spaces gradually reduce towards the inner region, where these cells are mostly radially elongated, arranged in radial rows, a few thick-walled cells found scattered singly throughout secondary cortex; secondary phloem narrow consisting of small, thin-walled, polygonal cells; phloem fibres thick-walled, occur in groups of 2-6 or singles, scattered throughout the phloem region; secondary xylem forms continuous ring; vessels angular, broader towards centre, arranged radially having spiral thickenings, surrounded by thick-walled parenchyma and xylem fibres; fibre walls uniformly thickened; multi and uniseriate medullary rays occur from primary xylem region upto secondary cortex; ray cells thin-walled, radially elongated in xylem region, circular to transversely elongated in phloem region. **Stem** - Shows somewhat sub-quadrangular outline; cork consists of 5-10 rows of rectangular, radially arranged, moderately thick-walled, brownish cells; collenchyma 4-8 layered consisting of isodiametric cells; a few thick-walled, isolated cells found scattered in this zone; cortical cells thin-walled, round, oblong, variable in size, with a number of large air cavities; a special feature of these cells is the formation of tangential and radial walls within the cell dividing it into 4-5 or more parts; most of cells contain numerous acicular crystals of calcium oxalate; endodermis single layered, composed of transversely elongate, thin-walled cells; phloem narrow, consisting of round to polygonal cells, peripheral ones larger, inner cells smaller; fibres thick-walled, single or in groups of 2-3, some cells contain calcium oxalate crystals similar to those found in cortical cells; xylem present in a ring; vessels with spiral thickenings, arranged radially; fibres elongated with wide

lumen and pointed tips, medullary rays uni to multi seriate extend upto secondary cortex; ray cells thin-walled, radially elongated in 2° xylem, transversely elongated in 2° phloem; pith large, composed of polygonal, thin-walled parenchymatous cells, having small intercellular spaces; a few cells contain calcium oxalate crystals similar to those found in 2° cortex.

Leaf

Midrib - Shows concavo-convex outline; epidermis on either surface covered with thick cuticle; collenchyma 2-5 layered; stele composed of small strands of xylem and phloem having some groups of fiber; rest of tissues composed of thin-walled, parenchymatous cells, a few of them containing acicular crystals of calcium oxalate.

Lamina - Shows epidermis single layer on either surface, composed of thin-walled, parenchymatous, tangentially elongated cells, covered with thick cuticle; stomata diacytic, 1-5 celled hairs present on both surfaces; palisade 1-2 layered; spongy parenchyma composed of 3-5 layered, loosely arranged cells traversed by a number of veins; palisade ratio 6.25-15.75; stomatal index 17.24-30.78; vein islet number 17-42.

Fruit - Shows single-layered epidermis covered with striated cuticle followed by 5-10 layered, thick-walled, oval to hexagonal, lignified, sclerenchymatous cells.

Seed - Shows hairy testa composed of thin-walled, tangentially elongated cells covered with pigmented cuticle; embryo composed of oval to polygonal, thin-walled, parenchymatous cells containing oil globules.

Powder - Light brown; shows aseptate, elongated fibres; vessels with simple pits and spiral thickening; palisade, acicular crystals of calcium oxalate, unicellular hairs, and globules.

Table 4: Gana Vargeekarana

Charaka Samhita	Shukrashodhana, Su. 4 Stanyajanana, Su. 4 Madhura Skandha, Vi. 8 Vamana dravya, Vi. 8
Sushruta Samhita	Not mentioned
Ashtanga Hrdaya	Not mentioned
Ashtanga Sangraha	Shukrashodhana, Su. 15 Stanyajanana, Su. 15
Bhava Prakash Ni.	Guduchyādi Varga
Kaiyadeva Nighantu	Aushadhi Varga/1090
Madanapala Nighantu	Abhayādi Varga
Dhanwantari Ni.	Karavirādi Varga
Raj Nighantu	Shatahvādi Varga
Shodhala Nighantu	Karavirādi Varga
Siddhamantra	Vātaghna Varga
Priya Nighantu	Shatapushpādi Varga/107
Nighantu Adarsh	Pātālādi Varga
Shabdachandrika	Vrkshādi Varga
Saraswati Ni.	Upala Varga
Hrdaya Deepika	Eka pāda Varga
Abhidhana Manjari	Sankirna Varga
Abhidhana Ratnamala	Swādu Skandha
Amarkosha	Dwitiya kānda, Vanaushadhi Varga
Ashtanga Nighantu	Viprakirna Prakarana
Raja Vallabha Ni	Aushadhāshraya Paricheda

Rasa Panchaka (Table 5) {V- Vata, P- Pitta, K- Kapha}

	BpN²	KN¹	MpN³	RN⁴	PVS¹³	API¹¹
Rasa (taste)	<i>Madhura</i> (sweet), <i>Amla</i> (sour), <i>Tikta</i> (bitter)		-		<i>Madhura</i> (sweet)	<i>Madhura</i> (sweet), <i>Amla</i> (sour), <i>Tikta</i> (bitter)
Guna (property)	<i>Pichchila</i> (slimy)	<i>Snigdha</i> (unctuous), <i>Pichchila</i> (slimy)	<i>Guru</i> (heavy)	-	<i>Guru</i> (heavy), <i>Snigdha</i> (unctuous), <i>Pichchila</i> (slimy)	<i>Snigdha</i> (unctuous), <i>Pichchila</i> (slimy)
Vīrya (potency)	<i>Shita</i> (cooling)					
Vipāka (metabolic effect)	-				<i>Madhura</i> (sweet)	
Doshagnata (Effect on dosha)	<i>Vata hara</i>		<i>K-V hara</i>	<i>K-P hara</i>	<i>V-P hara</i>	<i>K-V hara</i>

Karma^{1,2,3,4,11}

Vrsya (Aphrodisiac), *Balya* (Strengthening), *Ruchya* (Appetizer), *Mutrala* (Diuretic), *Vājīkarana* (Libido enhancer), *Santarpana* (Nourishing)

Rogagnata^{1,2,4,11,14}

Amavāta (rheumatoid arthritis), *Vātarakta* (psoriatic arthritis/gout), *Ashmari* (Calculi), *Trshnā*

(Pathological thirst), *Drashti roga* (Eye disease), *Shotha* (Swelling), *Pittaja atisāra* (Diarrhoea due to pitta dosha).

Pharmacological action¹⁵

Anti-convulsant, anti-neoplastic, hepatoprotective, antifungal, antispasmodic, respiratory stimulant, anti-bacterial, anti-inflammatory, diuretic, moderate anti-pyretic, hypotensive, vasodilatory, anabolic cum androgen-like activity, bronchodilatory, anti-tumor promoting activity against chemically induced hepatocarcinogenesis in Wistar rats.

Phytoconstituents¹⁵

Flowers: Apigenin-7-0-glucuronide and 7-0-glucoside.

Seeds: histidine, lysine, phenylalanine, linoleic, oleic, palmitic, and stearic acids, xylose, uronic acid, polysaccharides, xylan, lipase, protease, saponin, sterols, asterol I, II, III, IV, asteracanthine, asteracanthicine.

Root: lupeol, betulin, phytosterol, essential oil.

Leaves: lupeol, ascorbic acid, nicotinic acid.

Plant: betulin, lupeol, stigmasterol, n-triacontane, isoflavone glycoside, alkaloids B₁ & B₂, long-chain hydrocarbons(C27-35).

Aerial parts: 3-methylnonacosane, 23-ethylcholesta-11 (12), 23 (24)-dien-3 beta-ol, lupeol, 25-oxo-hentriacontanyl acetate and methyl 8-n-hexyltetracosanoate.

Amayika Prayoga

1. In case of *Ashmari* (calculi) – *Kalka* (Paste) made of *Gokshura*, *kokilaksha*, *eranda*, *brhati dwaya* (*Brhati* and *Kantakari*) with *kshira* and *madhura dadhi*. (Ch.Chi.26/62)
2. For *Vamana* (emetic therapy), *Madanaphala* with *ikshuvālika kwātha*. (Ch.Ka.1/25)
3. In *Plihodara* (Splenomegaly) - *Kshara* of *Pāri-jata*, *ikshuraka* and *apamārga*. (Su. Chi.14/13)
4. For *Vajikarana* (Aphrodisiac) purpose –
 - a. *Phala churna* (Powder of fruits) of *Kapikachu* and *Ikshuraka* with sugar and warm milk. (Su.Chi.26/33, A.H.Ut.40/31, A.S.Ut.50/25)
 - b. *Draksha*, *kapikachu beeja*, *Ikshuraka beeja*, *pip-pali*, *madhu*, *ghritha*, *sharkara* should be churned and made into *lehya* and consumed with milk. (Su. Ut.58/53)

- c. *Churna* (powder) of *madhulikā*, *māshaparni*, *sharkara*, *shrngataka*, *yava*, *swayamgupta moola*, *yashti*, *vidāri*, *ikshuraka* and *priyāla* with *madhu*, *ghritha*. (A.S.Ut.50/21)
 - d. *Pada lepa* (paste on the feet) with fruit of *adhyanda* (*ikshuraka*), *rshabhi*, *swayamgupta*. (A.S.Ut.50/59)
 - e. *Kokilaksha* is one among the list of *vrshya bhakshya*, *peya*, etc (aphrodisiac products) (A.S.Ut.50/69)
5. In the case of *Mutradosha* (urine pathologies) and *Ashmari* (calculi)- *Kalka* (paste) of *Bala*, *Gokshura*, *kraunch asthi*, *kokilāksha*, *tandula*, *shataparvaka*, *devadāru*, *chitraka* and *vibhitaki bija* with *sura*. (Su.Ut. 58/44)
 6. In the case of *Vatarakta* (psoriatic arthritis/gout) - *Kokilāksha Kashaya* (decoction) and *Kokilāksha* as *shaka* (vegetable) cure *Vatarakta*, similar to just as the practice of kindness wins over anger. (A.H.Chi. 22/18)
 7. In the case of *Kapha Vātaja Plihavrdhi* (splenomegaly) – *Taila* (Oil) is processed with *kshara* of *kadali*, *tila nala*, and *kshuraka*. (A.H. Chi15/95)
 8. In case of *Pittaja Mutraghata* (dysuria) – *Kashaya* (decoction) of *kandekshuraka moola* with *madhu*, *sharkara*. (A.S. Chi.13/3)
 9. In the case of *Ashmari* (calculi) – *Madhura dadhi* mixed with *kalka* of *simhi*, *vyaghri*, *gokshura*, *ikshuraka*, and *urubuka moola* (the root of *Ricinus communis* L.) for 7 days. (A.S.Chi.13/7)
 10. In case of *Sarva gulma* (abdominal lump/mass) and *shoola* (abdominal pain) - *Kashāya* of *māshaparni*, *mudgaparni*, *sahadevi*, *laghu pan-chamula*, *eranda*, and *ikshuvālika* was taken with *yavakshāra*. (A.S. Chi.16/20)

Ethnomedicinal use¹²

The root is employed in the form of decoction (about 2 ounces of the root is boiled in a pint of water, or 1 in 20, for 20 minutes to half an hour in a closed vessel); dose: -1 to 2 ounces two or three times daily, in rheumatism, in gravel, gonorrhoea and other diseases of the genito-urinary tract and hepatic obstruction with dropsy, i.e., jaundice and anasarca. Dr. Gibson & Dr. K. L. Dey recommend the use of the root as a

valuable diuretic in dropsy. Leaves and seeds are also useful in jaundice and anasarca. "Dr. Kanai Lal Dey recommends an *Acetum* made by macerating 2 ounces of freshly dried leaves for 3 days in 10 to 16 ounces of distilled vinegar, then pressing, & straining, which is a very useful preparation given in doses of ½ to 1½ ounces, or 1 to 3 tablespoonfuls thrice daily". An infusion of the leaves (1 in 10) macerated for 3 days and strained is also useful. Ashes of the plant are also used in dropsy and gravel. Tincture of the whole plant (1 in 3 of alcohol) in doses of 20 to 30 minims, three times daily was found beneficial in urinary affections, particularly dysuria and painful micturition. Seeds are given by Hakims with "sugar, milk or wine in doses of one to three dirhems" for impotence, gonorrhoea, and spermatorrhoea. Combined with *Tribulus Terrestris* and *Asparagus adsendens*, the seeds are given in powder, with cow's milk and sugar for general debility. A confection of the seeds containing a large

number of aphrodisiac, demulcent, nutritious, and aromatic stimulant substances has been in use for impotence, seminal and other debilities. For asthmatic complaints, a powder of the Talamkhana seeds is recommended to be given in a mixture of honey and ghee. For diarrhoea, the seeds ground into a paste and given in buttermilk or whey' prove very beneficial. Following preparation has been recommended for leucorrhoea in aksir-ul-imraz. -Take Talamkhana (seeds), Kamarkas, Bijabanda, Gum of *Bombax Malabaricum*, *Nardostachys jatamansi*, *Pistachia terebinthes*, and Poppy seeds in equal parts, and ten mashes (2 drachms) each of *Curculigo orchioides* and Pitch of *Shorea robusta* and one tuber of Saleb misri, pound and make a powder; dose is 5 - 9 mashes (1 to 1 drachms), with cow's milk.

Posology¹⁶

Churna (Powder): 3-6gm, *Kwātha* (Decoction): 50-100ml *Kshāra* (Alkali): 1-3gm

Formulation (Table 6)

Yoga	Use	Reference
<i>Stanyajanana Kashāya (Ikshuvālikā)</i>	Breast milk promoter	Ch.Su.4, A.S.Su.15
<i>Shukrashodhana Kashāya (Ikshuraka)</i>	Semen purification	Ch.Su.4, A.S.Su.15
<i>Brmhani Gutika</i>	<i>Vājikarana</i>	Ch.Chi. 2.1/24
<i>Māshadi Pupalika</i>	<i>Vājikarana</i>	Ch.Chi. 2.4/23 A.S.Ut. 50/41
<i>Vrshya Gutika</i>	<i>Vājikarana</i>	Ch.Chi.2.4/31
<i>Amruta Ghritha (ashwakhuraka)</i>	<i>Visha</i> (Poisonous condition), <i>Pāndu</i> (Anaemia), <i>Kāmala</i> (Jaundice)	Ch.Chi. 23/245
<i>Kalyāna lavana</i>	<i>Vāta vyādhi</i> , <i>Gulma</i> , <i>Pleeha</i>	Su.Chi. 4/32
<i>Kushādi Ghritha (Itkata)</i>	<i>Pittaja Ashmari</i>	Su.Chi. 7/9
<i>Balā taila (virataru)</i>	<i>Vātavyādhi</i> , <i>Mudha garbha</i> (obstructed labour)	Su. Chi. 15/44
<i>Kshāra agada</i>	<i>Visha</i> , <i>Ashmari</i> , <i>Shoola</i> ,	Su. Ka. 6/3
<i>Tila ikshurakādi Kshāra</i>	<i>Gulma</i> , <i>Vāta vyādhi</i>	Su.Ut.42/40
<i>Eranda dwādashaka</i>	<i>Sarva shoola</i>	Su.Ut.42/112
<i>Balā Ghritha</i>	<i>Mutra dosha</i>	Su.Ut. 58/58
<i>Vasishta Rasāyana</i>	<i>Kāsa</i> (cough), <i>Shwāsa</i> (difficulty in breathing)	A.S.Chi. 5/88 A.H.Chi.3/133
<i>Vidāryadi Ghritha</i>	<i>Vājikarana</i>	A.H.Ut. 40/21
<i>Swayamguptādi Modaka</i>	<i>Vājikarana</i>	A.S.Ut.50/38

Controversy

a. Chatrā and Atichatrā as Kokilāksha

Chatra and *Atichatra* are mentioned among *Madhura skandhas dravyas* (group of sweet substances), by Charaka Samhita (Ch.Vi.8/139). CP in his commentary on this, mentions the identification of *Chatra* and *Atichatra* as *Kokilāksha* and *Aruna Kokilāksha* respectively. This view is supported by PR which accepts *Chatraka* as the name for *Shveta Kokilāksha* and *Atichatraka* for *Aruna Kokilāksha*. But the following identification cannot be accepted for the following reasons:

1. In the same list of *Madhura Skandha Dravyas*, *Ikshuvālikā* is also mentioned which is a widely accepted synonym of *Kokilāksha*.
2. CP himself commenting on the ingredients of *Mahapaishachika Ghritha* (Ch.Chi.9/46) mentions *Chatra* as *Madhurika* and *Atichatra* as *Shatapushpa* or accepts both as *Dronapushpi dvaya*.
3. The latter view of identification of *Chatra* and *Atichatra* with the two varieties of *Dronapushpi* is supported by Dalhana in his commentary on Su.Su.29 which mentions the list of holy herbs which should be worn by the patient after surgery.
4. *Chatra* and *Atichatra* are also mentioned in the list of *Divya-Aushadhi* (Celestial herbs) or *Indra prokta Rasayanas* growing in Himalaya by Charaka (Ch.Chi.1.4/6) and in the list of *Maha aushadhi* i.e. Great Herbs equal in potency to *Soma* by Sushruta Acharya (Su.Chi.30/5), and both herbs were given following description by Sushruta: “*Chatra* and *aticchatra* arise from tuber and are similar to *śvetakāpoti* in appearance. They destroy *rakṣas* and prevent senility and death.” (Su.Chi.30/14) “In kashmir, there is a celestial lake named '*Kṣudrakamanasa*'. There grow *karenu*, *kanyā*, *chatrā*, *aticchatrā*, *golomi*, and *mahāśravanī*.” (Su.Chi.30/33)
5. *Chatrā* and *Atichatrā* are not accepted as synonyms of *Kokilāksha* by other available commentaries on Brihatrayi and by no other available

Nighantu. Hence, *Chatrā* and *Atichatrā* cannot be identified as varieties of *Kokilāksha*.

b. Kāndekshu as Kokilāksha

Kāndekshu is mentioned as a synonym for *Kokilāksha* by BpN, AK, and SC, but it cannot be accepted because in various places of Samhitas these herbs are mentioned together in the lists as:

-*Kandekshu* and *Ikshuraka* in *Shukrashodhana Mahakashāya* by Charaka (Ch.Su.4/12) and Vagbhata (A.S.Su.15/25)

-*Kandekshu* and *Ikshuvalika* in the list of drugs for *Kānda Asava* preparation. (Ch.Su.25/49) and in Vamana procedure. (Ch.Vi.8/135)

Dalhana at one place commenting on the list of *Trina panchamula* drugs – “*Kusha*, *Kāsha*, *Nala*, *Darbha* and *Kandekshuka*” (Su.Su.37/75), mentions “*Kandekshuka*” as “*Mahati Khagali*” – which is one among the synonyms used for *Kokilāksha*, though he also mentions that others just read-only “*Ikshu*” or only “*Kanda*” which means “*Shara*” instead of reading “*Kandekshuka*” together. The alternative reading is supported by the fact that both *Shara* and *Ikshu* are separately mentioned in the lists of *Trina panchamulas* by Charaka and by Vagbhata: “*Shara*, *Ikshu*, *Darbha*, *Kasha*, *Shali*” (Ch.Chi.1.1/44) (AS.Su.12/61) (A.H.Su.6/171)

Also, nowhere else throughout Sushruta Samhita the name “*Kandekshu*” is found, and generally “*Kashthekshu*” is used instead (Su.Su.45/149,153). Both *Kāndekshu* and *Kāshthekshu* are commonly accepted as a variety of *Ikshu* itself be accepted as a synonym for *Kokilāksha*.^{17,18,19}

c. Adhyanda as Kokilāksha

AN mentions “*Adhyanda*” among the synonyms of *Kokilāksha*. The same synonyms are quoted by Indu - “*Adhyanda*, *Iksuraka*, *Tailakantaka*, *Kokilakshaka*” in the commentary on A.S.Ut. 50/59 where formulation for *pada lepa* in *vajikarana* is described with fruits of *adhyanda*, *rshabhi*, and *swayamgupta* to be applied.

But in the same chapter earlier on A.S.Ut 50/25 Indu takes *Adhyanda* as a synonym for *Kapikacchu*, commenting that *Svayamgupta* and *Ikshuraka* from the shloka are *Adhyanda* and *Kokilāksha* respectively.

KN (*Aushadhivarga/607*), PR (1/45-46) and SC (*Vrikshādi Varga/130-131*) also mention *Adhyanda* as a synonym for *Kapikacchu (Mucuna Pruriens)*. But this cannot be accepted at least in the context of the passage A.S.Ut. 50/59, because *Kapikacchu* is already mentioned in the given formulation under the name of “*Svayamgupta*” along with *Adhyanda*. Apart from the above formulations in Ashtanga Samgraha the name “*Adhyanda*” is found in Brihatrayi among the ingredients of *Agurvādi taila* mentioned by Charaka (Ch.Chi.3/267). Chakrapāni’s commentary on this mentions “*Adhyanda*” as “*Shukashimbī*” which is *Kapikacchu*. Though *Kokilāksha* under the names of “*Ikshuraka*” etc. is widely used in *Vājīkarana* formulations, but *Agurvādi taila* contains predominantly *Ushna Virya* drugs, while *Kokilāksha* is mentioned by all the Nighantus as having *Shita Virya*.

Hence, due to the scanty available information the above controversy of *Adhyanda* as a synonym for *Kokilāksha* cannot be resolved completely.

d. Itkata as Kokilaksha

The plant *Itkata* is twice identified by Dalhana as *Khaggali* – one of *Kokilāksha*’s synonyms, on Su.Su.21/23 as *Khaggali* and on Su.Chi.7/9 as “*Mahati Khagali*”.

Dalhana himself also mentions “*Khaggali*” as a synonym of *Kokilāksha* in his commentary on Su.Ut.42/123 and on Su.Ut.58/44. Gayadāsa also in his Nyāya Chandrika commentary mentions “*Khaggalika*” as a synonym for “*Ikshuvālika*” which is a famous name for *Kokilāksha*.

CP twice mentions “*Khagalika*” as a synonym for *Ikshuvālika* (Ch.Su.4/12, Ch.Chi.2.1/24) In Charaka Samhita and Ashtanga Samgraha the name “*Itkata*” is mentioned in the lists of *Stanyajanana* and *Mutravirechanuya Mahakashāyas* (Ch.Su.4/12,15, Ch.Sh.8/57, AS.Su.15/22,35). But in the lists of *Stanyajanana Mahakashāya* (Ch.Su.4/12) in both the texts *Itkata* is mentioned along with *Ikshuvālika*. And Chakrapani on Ch.Su.4/12 identifies *Ikshuvālika* as *Khagalika*, and not *Itkata*. In the context of *Madhura skandha* in Charaka Samhita (Ch.Vi.8/139), *Ikshuvālika* and *Itkata* both are mentioned, and there also *Itkata* is followed by *Sharamoola*. Both *Shara* and

Itkata are also mentioned together by Charaka as ingredients of *Chandanādi taila* (Ch.Chi.3/258). PVS here says that *Itkata* and *Shara* can be the same plant wherein *Itkata* is the whole plant and *Shara* is specified for the moola of *Itkata* just as *Ushira* and *Veerana* (its root). This view is supported by KN, where *Itkata* is mentioned as a synonym of *Munja/Shara*. PVS concludes by mentioning *Itkata* as a variety of *Ikshu* which is similar to *Kokilāksha* sp. *Hygrophila salicifolia* being *tikshna mutrala* and *shukrala*.¹⁹ Hence, even though some similarity in properties is present between the two, *Itkata* cannot be accepted as a synonym for *Kokilāksha*.

DISCUSSION

The drug *Kokilāksha* is an annual herb, which commonly grows in waterlogged places throughout the country. *Kokilāksha* can be used as a whole plant, roots, or seeds separately. This review focused on the compilation of literature from Brhatrayi and seventeen Nighantus. *Kokilāksha* is found under different names in a different context in Ayurveda classics such as *Kshuraka*, *Ikshuraka*, *Kshura*, *Ikshura*, *Ikshuvālika*, etc. The drug possesses *Madhura*, *Amla*, *Tikta rasa*, *Guru*, *Snigdha* and *Pichchila guna*, *Shita virya*, and *Madhura vipaka*. *Kokilāksha* is used in various disorders like *Amavata*, *Ashmari*, *Netra roga*, *Vatarakta*, *Trshna*, *Shotha*, *Pittaja atisara*, *Pittaja mutraghata*, *Gulma*, *Shoola roga*. Also, it is widely used for *Vājīkarana* purposes. It is mentioned among drugs used in *Vamana* therapy by Charaka. Sixteen compound formulations were found having *Kokilāksha* as one among the ingredients in Brhat-trayi. Fifty different names were mentioned for this drug by various authors. A varied number of synonyms mentioned by various acharya led to the controversy in its identification which the authors had tried to resolve.

CONCLUSION

A thorough investigation of the drug *Kokilāksha - Hygrophila auriculata (Schumach.) Heine* was done from the Ayurveda literature including Brhat-trayi and Nighantus. The plant serves as an important source for its therapeutic use. Since the drug is widely

distributed and easily available throughout the country, further experimental, pre-clinical, and clinical research on the drug is required to establish the therapeutic efficiency and mechanism of action in the mentioned disorders.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Aditi Gandhi et al: Literary Review on Kokilāksha - Hygrophila Auriculata (Schumach.) Heine. International Ayurvedic Medical Journal {online} 2022 {cited May 2022} Available from:

http://www.iamj.in/posts/images/upload/1209_1218.pdf