

REVIEW ARTICLE

Identification of *Kapila Jalauka*: Correlating Ancient Ayurvedic Descriptions with Modern Medicinal Leeches

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ABSTRACT

Jalauka (leech) is a water-dwelling organism used in *Jalaukavcharan*, a traditional Ayurvedic bloodletting therapy, particularly effective in *pitta dosha* vitiated disorders. Ancient Ayurvedic texts classify *Jalaukas* into two types: *Savish* (toxic) and *Nirvish* (non-toxic). *Nirvish Jalauka* was traditionally employed for therapeutic *Raktamokshana* (bloodletting). However, classical texts provide only limited descriptions of their characteristics, habitats, and procedures, and there is no documented scientific identification of the *Nirvish Jalauka* to date.

Aim: To identify the closest modern biological equivalent of *Kapila Jalauka* described in Ayurvedic classics by comparing the characteristics of leeches from the Hirudidae family found in India and surrounding regions.

Material and Methods: A comparative analysis was done among various species of the Hirudidae family native to India by the available sources and materials. The characteristics mentioned in classical literature for *Kapila Jalauka* such as *Manahshilaranjitambhya parshva*, *prushthe snigdham*, and *prushthe mudga varna* were used to identify this *Jalauka*.

Results: Among the Hirudidae family leeches studied, *Hirudinaria* (*Poecilobdella*) *granulosa* exhibited the maximum resemblance to the classical description of *Kapila Jalauka*. This species is currently also the most commonly used medical leech in bloodletting procedures.

Conclusion: It was found that *Hirudinaria* (*Poecilobdella*) *granulosa* leech has maximum characteristics of *Kapila Jalauka* and it is found the closest match.

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KEYWORDS

- *Hirudinarin* (Poecilobdella) granulosa • *Jalaukavacharan* • Kapila *Jalauka*
- Medicinal Leech • *Nirvish Jalauka* • *Savish Jalauka*

INTRODUCTION

Jalaukavacharan (Leech Therapy) is one of the para surgical being used since ancient time in Ayurveda treatment therapy to treat various kind of skin diseases especially *Pitta dosha* vitiated disorders. This *Jalauka* (Leech) is a water dwelling animal.

Acharya Sushruta had mentioned total 12 types of *Jalauka* (leech)¹. Among them, 6 types of *Jalauka* are *Savish* (poisonous) (non-medicated leeches) *Jalauka* and 6 are *nirvish* (non-poisonous) (Medicated leeches) *Jalauka*.

About 700 species of leeches (Annelida: Hirudinea) are known from the world, whereas only 70 species have so far been recorded from India. Most of the leeches inhabit freshwater ecosystems. As many as 55 species under 24 genera and 5 families are recorded from the freshwater bodies of India and 36 of them are endemic.² "Medicinal leech" is a common name that describes blood feeding clitellate annelids in the family Hirudinidae of the order Hirudinida.

It is very difficult to identify these *Jalauka* at present time as in classics as there is very brief description we could get in *Samhitas*. Since Acharya Sushruta described leeches over a thousand years ago, potential genetic and environmental changes may have altered their characteristics. This study, therefore, seeks to bridge the gap between classical descriptions and modern scientific classifications. So, in this study only Kapila type of *Jalauka* is taken to identify as per modern classification of leeches as it is being used widely in ayurvedic general practice.

AIM

This study aims to identify the Kapila variety of leech by comparing its ancient Ayurvedic description with modern zoological classifications.

Significance of Identifying Kapila *Jalauka*

The identification of Kapila *Jalauka* is essential for reviving ancient Ayurvedic

practices with scientifically validated species. Medicinal leech therapy (*Jalaukavacharan*) is still relevant today, used in microvascular surgeries, reconstructive procedures, and conditions requiring controlled bloodletting. By correlating Ayurvedic descriptions with modern species, this study strengthens the integration of traditional medicine with contemporary healthcare.

METHOD

The study was conducted through a systematic review of Ayurvedic texts, zoological literature, and available published resources on medicinal leeches. The following methodological approach was adopted for this study:

Literature Review

- Classical Ayurvedic texts, including *Sushruta Samhita* and *Ashtanga Hridaya*, were reviewed to extract descriptions of Kapila *Jalauka*, including its morphological features, habitat and characteristics.
- Modern zoological classification studies on medicinal leeches, particularly from the *Hirudidae* family, were examined to identify species that share similar traits with Kapila *Jalauka*.

Identification Criteria

- The characteristics of Kapila *Jalauka* described in Ayurvedic texts, such as *Manahshilaranjitambhya parshva* (yellowish-orange lateral stripes), *Prusthe Snigdham* (smooth dorsal surface), and *Prusthe Mudga Varna* (greenish color on dorsal) were used as key identification parameters.
- Contemporary species of the *Hirudidae* family were analysed for these morphological traits to establish correlations.

Comparative Analysis

- A comparative table was created to match the features of Kapila *Jalauka* with

different species of leeches found in India and surrounding regions.

- Special emphasis was placed on *Poecilobdella granulosa*, a species widely used in medicinal applications, due to its strong resemblance to *Kapila Jalauka*.

Validation through Secondary Sources

- Data from zoological surveys and research papers on freshwater leeches in India were reviewed to confirm the presence, size and ecological habitat of *Poecilobdella granulosa*.
- Ayurvedic pharmacopoeias and existing scientific literature on leech therapy (*Jalaukavacharan*) were cross-referenced to ensure alignment with traditional therapeutic applications.

This methodological approach enabled the identification of *Poecilobdella granulosa* as the closest modern equivalent to *Kapila Jalauka*, providing a bridge between ancient Ayurvedic knowledge and contemporary biological classification.

Features of *Kapila* Variety of Leech:

Kapila have flanks as they colored with *manahshila* (realgar) (*Manahshilaranjitambya parshva*), their back is unctuous (oily) (*prushthe snigdam*) and has the color of *mudga* (green gram) (*prusthe mudga varna*).³

Habitats and General Characteristics of *Nirvish Jalauka*:

The countries such as Turkestan (Yavana), the Deccan (Pandya), the tract of land traverses by the Ghat Mountains (Sahya) and Pautana (modern Mathura) are the natural habitats of these leeches.⁴

The origin of non-poisonous leech (*Nirvish Jalauka*) is live in clear waters as the petrified stems of the several aquatic plants known as Padma, Utpala, Nalina, Kumuda, Saugandhika, Kuvalaya pundarika and the common zoophytes.⁵

The non-poisonous leechs (*Nirvish Jalauka*) swim about in sweet scented waters, live on non-poisonous weed, lies on the leaves of flowering water plants instead of on the dank

and oozy beds of pools and such blood from the affected part of a human organism without causing any discomfort.⁶

These leeches are especially *Nirvish* (non-poisonous), *Balvatyah* (strong), *Maha sharir* (having large body), *Sidhra Payinyo* (start to suck blood immediately) and *Mahashana* (suck the blood in large quantity).⁷ and ⁸

According to Acharya Vagbhatt, *Nirvish Jaloka* born and leaves in clean water, which are blue like algae, round in shape, having blue lines in their back, rough/hard back, thin body, slightly yellowish belly.⁹

Description about length of *Nirvish Jalauka*:

Acharya Vagbhatt had mentioned that the maximum length of *Nirvish Jalauka* is Eighteen (18) anguls and among them, the leeches which length is 4, 5 or 6 *angulas* should be used for human and long size *Jalauka* should be used in animals.¹⁰

Family Hirudidae

At present era, *Hirudidae* family leeches are being used as a medical leeches. The leeches of this family are of medium to large size; some of them attain a length of 37.5 cm or even 45 cm and a width of 2.5 cm when fully extended.¹¹

The species of this family are of medium to very large size, some of them attain a length of 37.5 cm or even 45 cm and a width of 2.5 cm when fully extended. These are true jawed leeches with five pairs of eyes forming a regular arch. Third and fourth pairs of eyes are separated by an annulus. Complete somites quinquannulate. Dorsal sensillae in eight and ventral in six series. They live mostly in water and most of these are amphibious more or less. Most members of this family are swamp animals rather than inhabitants of larger and deeper waters.

Hirudidae family has six Genus which are described in Table 1.

Features of *Hirudidae* family leeches

The characteristics of each Genus of this family are mentioned in below Table 1 and 2. The leeches which are available in India and surrounding area are only mentioned in these tables.

Table 1: Brief description about Hirududae family Leeches^{13,14}

Name of Genus	Common characteristics of the Genus	Name of Leeches available in India.
<i>Dinobdella Moore</i>	Size and form variable. Colour nearly solid without definite pattern. Complete somite of quadrannulate or quinquannulate. Eyes small, normal in arrangement but often obscure.	<i>Dinobdella ferox</i> <i>Dlnobdella nolala</i>
<i>Haemopsis Savigny</i>	Colour dark without any definite markings. In living condition the body is exceptionally soft and flabby. The body is thick for the greater part of its length, gently tapering at the anterior, and posterior extremities. Caudal sucker is small and weak. Colour dark without any definite markings.	<i>Haemopsis Savigny</i>
<i>Hirudo Linnaeus</i>	Size medium to large. Colour pattern usually longitudinally striped, but occasionally spotted or solid.	<i>Hirudo asiatica</i> <i>Hirudo birmanica</i>
<i>Myxobdella Oka</i>	The body is soft and flabby, thick for the greater part of its length, gently tapering at the posterior and anterior extremities, but caudal sucker much larger. Complete somite imperfectly quinquannulate. Jaws very small, distichodont with very few imperfect teeth.	<i>Myxobdella annandaiei</i>
<i>Poecilobdella Blanchard</i>	Size of the species of this genus is medium to very large. Form generally robust, widest near middle and tapered little to the ends. Colour variable, green, brown or reddish with a very precise pattern of black stripes and metameric spots, which becomes broken and dissipated with age.	<i>Hirudinarin (Poecilobdella) granulosa</i> <i>Poecilobdella manillensis</i> <i>Poecilobdella viridis</i>
<i>Whitmania Blanchard</i>	The genus is of large size. Body robust and slender attenuated cephalic region very characteristic. Sucker of medium size. Colour pattern longitudinally striped.	<i>Whitmania laevis</i>

The brief description about the leeches of these Genus is mentioned in Table 2.

Table 2: Discription of Hirudidade Family Genus Leeches^{15,16}

Name of Leech	Size and Shape	Color	Area availability	Field observation
<i>Dinobdella ferox</i>	Size very large, upto 20 cm to 25 cm or more in life, elongated with greatest width far back, and anterior end slender.	Colour in life dark green, entirely without markings.	India: Bilaspur (Himachal Pradesh); Muktesar, Nainital (Uttar Pradesh); Darjeeling (West Bengal); Manipur and Sikkim. Outside India: Sri Lanka and Siam.	The species is parasitic of domestic and wild mammals and also free-living in water. It can be found in ponds and paddy fields. It is also known as cattle leech.
<i>Dlnobdella nolala</i>	Size medium, in life probably 5 cm to 8 cm long when extended. The form is elongate, oblongelliptical, with the ends nearly equally rounded, strongly flattened.	Living colour probably dark olive-green clouded with dusky, but without definite colour markings; paler and less green ventrally. Head and caudal sucker of about normal dimensions.	India: Kodaikanal, Otaeamund and Ketu (Tamil Nadu).	The species is free living and amphibious at swampy places.
<i>Haemopsis illdicus</i>	Body exceptionally soft and flabby. It is thick for greater part of its body, gently tapering at both the extreme ties. The ventral surface is more or less flat and the dorsal is broadly arched. The posterior sucker is small and weak.	Colour dark without any definite markings	India: Pahalgam, Srinagar (Jammu and Kashmir).	The leeches are commonly known as burrowing leeches and inhabit swamps and shallow waters. They are found attached to submerged articles, burrowing in soft muds. They are also amphibious in nature.

Table cont....

<i>Hirudo asiatica</i>	Size small 5 cm to 8 cm in length, slender with larger sucker.	Colour uniform dark olive or brown without markings. Sensillae obscure.	India: Kanpur (Uttar Pradesh). Outside India: Afghanistan.	The species is found in freshwater and attacks frogs.
<i>Hirudo birmanica</i>	Length in life from 5 cm to 7 cm long, slender and small-headed.	Colour olive or olive-brown with seven dusky or brown dorsal stripes.	India: Nagaur, Jodhpur (Rajasthan); Allahabad (Uttar Pradesh); Sonali, Solmari (Bihar); Nilgiri Hills, Kilakaria (Tamil Nadu); Satara (Maharashtra); Mysore, Bangalore (Karnataka); West Bengal; Punjab; Udhampur, Rajouri (Jammu and Kashmir). Outside India: Pakistan, Sri Lanka and Burma.	Cephalic sucker small and caudal sucker of medium size. It is found in rivers, streams, swamps, tanks and even in wells. It attacks human beings and animals. It is free-living and sanguivorous.
<i>Myxobdella annandaiei</i>	Length in life about 5 cm to 10 cm. Form robust. Sucker large, nearly equal to maximum width.	Colour pale grey, more or less closely maculated with black or dusky blotches.	India: Yercaud (Tamil Nadu).	The specimens can be collected from bill streams attached to submerged articles,
<i>Hirudinarin (Poecilobdella) granulosa</i>	Size large and form robust than other species of the genus <i>Poecilobdella</i> .	Colour of dorsum varied shades of olive-green, often divided by one or two pairs of yellowish longitudinal stripes, and marked by a black pattern consisting of a median constricted or broken line; four pairs of narrow wavy lines bordering the yellow stripes. This pattern is variable and disappears with increasing size. Margins with yellow or orange stripe, venter usually reddishorange with sub-marginal black stripe.	India: West Bengal; Sikmai Turail (Assam); Manipur; Udhampur, Rajouri (Jammu and Kashmir). Outside India: Sri Lanka, Burma, Java, Sumatra, Malaysia and Philippines.	The species inhabits paddy fields, tanks and pools. It attacks domestic animals and man. It can also be used as medicinal leech.
<i>Poecilobdella manillensis</i>	Form of the species is almost like <i>P. granulosa</i> , robust, broad headed, circular in buccal region, broadly elliptical elsewhere with sides broadly rounded.	Colour pattern and other external characters like <i>P. granulosa</i> but ground colour more inclined to brown dorsally and more green ventrally.	India: Landaaur (Uttar Pradesh); Darjeeling, Calcutta (West Bengal); Cachar (Assam); Karnataka; Cochin Kerala). Outside India; Pakistan, Sri Lanka, Burma, Borneo, Malaysia, Philippines and China.	It is the common paddy-field, buffalo or medicinal leech of the lowlands of India. 1~his species inhabits rice fields, swamps, ponds, tanks and in sluggish streams and springs. They also attack man and found attached to frogs, snakes and turtles.
<i>Poecilobdella viridis</i>	The general form of this species is similar to that of <i>P. granulosa</i>	Colour is more greener and pattern disintegrated more completely earlier in life. The black pattern is chiefly limited to transverse rows of midmetameric spots. Dorsum is bright olive-green and venter in greyish-green, sharply separated by bright marginal orange stripes. Head a little broader. The lip marked on the venter by a median furrow. Caudal sucker more or less smaller.	India: Bilaspur (Himachal Pradesh); Varanasi (Uttar Pradesh); Etakare (Tamil Nadu); Travancore (Kerala); Kashmir (Jammu and Kashmir). Andhra Pradesh; Assam; Bihar; Gujarat; Himachal Pradesh; Madhya Pradesh; Maharashtra; Manipur; Odisha; Punjab; Rajasthan; Uttar Pradesh; Tamil Nadu; West Bengal. ¹⁷	The specimens can be collected from paddy-fields, tanks and pools. Not much is known about its bionomics.

<i>Whitmania laevis</i>	Length when mature 10 cm to 15 cm. Thick-bodied for most of length, contracting sharply with the abruptly-tapered anterior end and small head. Sucker of medium size.	Colour in life olive-brown on dorsum with five dark stripes, including pale yellow spots. Ventral side paler with a reddish or yellow tinge streaked and spotted with black. Jaws having two series of thin chitinous plates in place of true teeth. This species has more slender anterior end with smaller sucker than <i>Dinobdella Jerox</i> .	India: Paglanadi (Manipur). Outside India: Burma, China, Formosa and Japan.	The species can be collected from hill streams, ponds, ditches and submerged articles, It is very sluggish in nature.
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As above mention table shows that *Poecilobdella* Blanchard Genus Leeches are having more similarity within the characteristics of *Kapila Jalauka*. In this Genus, among all the leeches,

Hirudinarin (Poecilobdella) granulosa leech having more similarity with *Kapila Jalauka* and comparison between these two is mentioned in Table 3.

Table 3: Comparison between *Kapila Jalauka* and *Hirudinarin (Poecilobdella) granulosa* leech.

Characteristics of <i>Kapila Jalauka</i>	<i>Hirudinarin (Poecilobdella) granulosa</i> leech
Manahshilaranjitambhya parshva	Margins with yellow or orange stripe, venter usually reddish-orange with sub-marginal black stripe.
Prushthe Snigdham	---Not Found---
Prusthe Mudga Varna	Colour of dorsum varied shades of olive-green, often divided by one or two pairs of yellowish longitudinal stripes, and marked by a black pattern consisting of a median constricted or broken line; four pairs of narrow wavy lines bordering the yellow stripes. This pattern is variable and disappears with increasing size.
Acharya Vagbhatt had mentioned that the maximum length of <i>nirvish Jalauka</i> is Eighteen (18) anguls and among them, the leeches which length is 4, 5 or 6 angula should be used for human and long size <i>Jalauka</i> should be used in animals.	Size large and form robust than other species of the genus <i>Poecilobdella</i> . The average length of <i>Hirudidae</i> family leeches are medium to very large size, some of them attain a length of 37.5 cm or even 45 cm and a width of 2.5 cm when fully extended
The origin of non-poisonous leech is live in clear waters as the petrified stems of the several aquatic plants known as Padma, Utpala, Nalina, Kumuda, Saugandhika, Kuvalaya pundarika and the common zoophytes.	The species inhabits paddy fields, tanks and pools. It attacks domestic animals and man. It can also be used as medicinal leech.

RESULTS

Among the *Hirudidae* family leeches studied, *Hirudinarin (Poecilobdella) granulosa* exhibited the maximum resemblance to the classical description of *Kapila Jalauka*. This species is currently also the most commonly used medical leech in bloodletting procedures.

DISCUSSION

The identification of *Kapila Jalauka* is significant as it helps revive an ancient Ayurvedic practice with potential modern therapeutic applications. Medicinal leeches are widely used today for microvascular

surgeries, skin grafts, and other conditions requiring controlled bloodletting. Correlating ancient descriptions with modern species can enhance our understanding and application of leech therapy in integrative medicine. The strong resemblance between *Kapila Jalauka* and *Poecilobdella granulosa* suggests that the latter may be the most suitable species for use in Ayurvedic bloodletting procedures. This insight can guide Ayurvedic practitioners in selecting appropriate medicinal leeches for clinical applications.

The comparison of *Kapila Jalauka* and *Hirudinarin (Poecilobdella) granulosa* leech is it with shown in table 3.

Kapila *Jalauka* and Hirudinarin (*Poecilobdella*) granulosa leech both have *Manahshilaranjitambyha parshva*, *Prusthe Mudga Varna*. Though Hirudinarin (*Poecilobdella*) granulosa leech lives in water, it is understood that it has also *Prushthe Snigdham* characteristic present.

As in classical texts, only 3 characteristics of

Kapila *Jalauka* and area of collection of *Jalauka* were found, so, here in this table only these characteristics with their availability area are mentioned.

The external appearance of Hirudinarin (*Poecilobdella*) granulosa leech is showing in below figures 1, 2 and 3 to compare the characteristic with Kapila *Jalauka*.



Figure 1A & B: Lateral Aspect of two different Hirudinarin (*Poecilobdella*) granulosa leech



Figure 2A & B: Dorsal view of Hirudinarin (*Poecilobdella*) granulosa leech



Fig 3: Ventral view of Hirudinarin (*Poecilobdella*) granulosa leech

As Acharya Vagbhatt has mentioned that 4, 5 or 6 *angula* length *Jalauka* should be used for blood-letting in human being. As per

Ayurvedic Pharmacopeia of India book, 1 *angula* is equal to 1.95 cm in length. So, 4 to 6 *angula* length is equal to 7.8 cm to 11.7 cm

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