

CONCEPT OF JALAUKAVACHARANA  
(LEECH APPLICATION) IN AYURVEDA



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ABSTRACT

Jalauka is very much Beneficial in vitiated Raktaja (Blood related) disorders, it expels vitiated Rakta Dosha (vitiated Blood) completely from selected part of the body. So Leech therapy (Jalaukavacharana) takes a predominant place in the list of Shodhana Chikitsa (Purification Procedure) right from the beginning of medical history. Acharya Sushruta has described Jaluaka (Leech) under the heading of Anushastrs (parasurgical procedure). It is much safer and less complicated natural process, therefore indicated even for King, Rich, Old, Fearful, Weak, Women and the people of tender nature. The Physician who knows about the Leeches, their Habitat, Method of collection, Varieties, Storage and method of application becomes successful in treating the many diseases. There is need of understanding the applicability and scientific region to Leech apply is essential so effort has been made to understand the Leech application in various disorders.

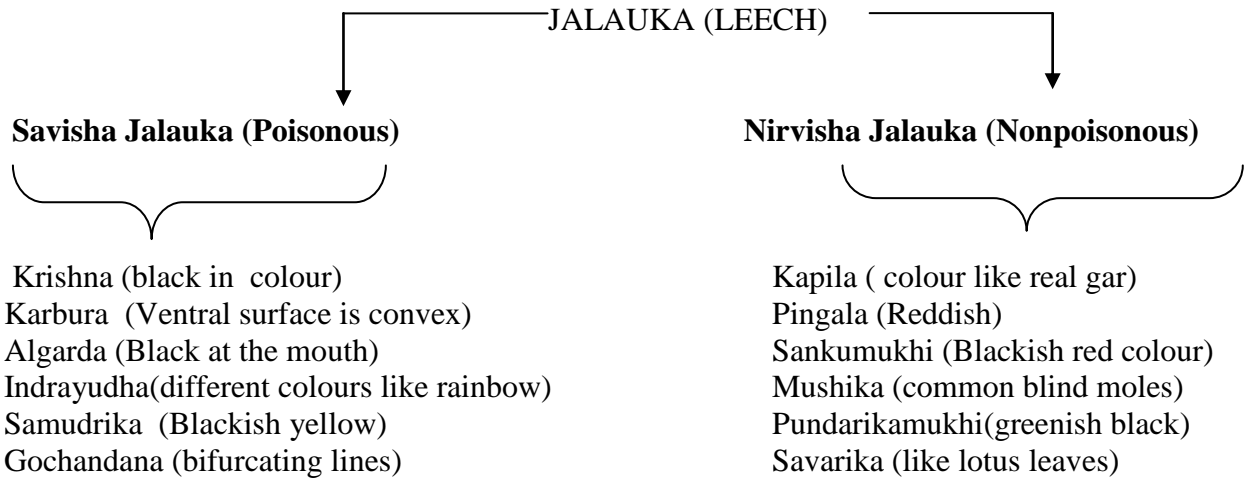
HISTORY:

Medicinal Leeches have been used for bloodletting since the Stone Age. Evil spirits were thought to cause illness and removal of these evil spirits required blood withdrawal. Records of the medical usage of Jalaukavacharana date back to the beginning of civilization. Illustration of Leech applica-

tion to patients was found in Egyptain tombs dating back to 1500 B.C.

Classification

According to Sushrutacaharya and Vagbhatacharya the Jaluka is broadly classified into two groups i.e. Savisha and Nirvisha (poisonous and Non -Poisonous), each group is having 6 Subgroup of Jalauka. <sup>1,2</sup>



**Savisha Jalauka (Poisonous)** Originates in the decomposed urine and fecal matter of toads and poisonous fishes in ponds of stagnant and turbid water

#### **General Characters**

Thick in middle portion, while both ends are thin, Slow locomotion Fatigues, Middle part elongated, Delay in sucking, Not commendable type, Sucks little quantity of blood (Ayata) where slight elevation or evation also placed. Resemble the fish of vermin type (Sarpakara)

#### **Effect of Savisha Jalaukavacharana (Poisonous Leech Application)**

Boil, Burning Sensation, Delirium, Drowsiness, Edema, Erysipelas, Fever, Itching, vetiligo due to scratching over the Leech bite area, Swelling, Unconsciousness

#### **Nirvisha Jalauka (Non-poisonous)**

Originates in decomposed vegetable matter, as the purified stems of the several aquatic plants known as Padma, Utpala, Nalina, Kumuda, Pundarika and common zoophytes, which live in clear water

#### **General Characters**

Strong and large bodied, Ready suckers, Greedy (Mahashana), Saivala Shyava (Varna), Vrutta (round) Blue colored lining in dorsal side of the body, back side in Kashaya color. According to Acharya Vagbhata the Jalauka has been classified according to their Sex characters.

**Female Jalauka:** Delicate, Having thin skin, Head is small sized, lower body is large.

**Male Jalauka:** Skin is hard; Big head along with being semi lunar in look with large front portion are male. Alpa Dosha and acute disorders the female Jalauka has been used while the male Jalauka are advised in highly vitiated Dosha and chronic disease.<sup>3</sup>

#### **Availability**

The medicinal Leeches resides both in water and land but usually it is found in

watery regions, swims in sweet water, live in the dark and oozy beds and sucks blood from the affected part of human or animal without causing any discomfort. Leeches take shelter under legs, stones, plants and other objects in shallow water, also in fresh water, ponds, lakes, tanks, swamps and rice field where always water stagnates.

#### **Collection and Preservations of Leech:**

Acharya Sushruta has told that the Leeches can be caught with a piece of wet leather, in tanks, streams and where there are lotuses. There is another method to collect the Leeches i.e. the fresh meat of dead animals, fish or milk must be applied on the thigh of an animal or the Human being himself, and keep the thigh in the water for some time. Jalauka will attract and will catch the place. Then remove them from the skin of the person with the application of Saindhava (rock salt) and collect<sup>4,5</sup>

**Preservation of Leeches:** After collecting the Leeches, they should be kept in a wide and new earthen pot. The pure water of tank with lotus should be filled into the pot. Feed it with leaf of lotus plants (Kamala Nala), the meat of pig and other animals, which are living in watery and muddy areas, and powder of stem of small plants. The grass and leaves of plants must be kept inside water in the pot for the bed. On every third day the water should be changed and feeding should be dropped inside the pot. After seven days the pot should be changed.

**Indications of Jalaukavacharana:** Only Vagbhata has mentioned diseases where Jalaukavacharana is indicated like – Gulma (palpable hard mass in abdomen), Arsha (piles), Vidradhi, Kustha (various Skin diseases), Vatarakta (Gouty Arthritis), Galaroga (Throat disorder), Netra Roga (Eye Diseases), Visha Danshta (poisonous bite due to various insects) and Visarpa<sup>145</sup>. Acharya Sushruta has advocated Raktamok-

shana by Jalauka especially to King, Rich people, Children, Old aged, weak, Females and Delicate people<sup>6</sup>

### LEECHES ACCORDING TO MODERN VIEW

Leeches are worm like creature; that has been used for long time in different ways for medical purposes in Europe.

#### Hirudo Medicinalis

Phylum: Annelida, Class: 3 – Hirudinea, Order: H. Limnobia. Family: Hirudinae, Genus: Hirudinaria, Species: H. medicinalis.

#### External Features:

##### Shape & Size:

- Leeches are small, soft, invertebrate vermiform = worm like structure
- Elongated, dorso-ventrally flattened,
- Almost cylindrical when contracted and ribbon shaped when extended
- 7 to 15 cm is length having 6 longitudinal reddish or brown strips.
- Broadest at near the posterior end & narrowest at near the anterior end
- Dorsal surface is somewhat convex and ventral surface is more or less plane
- Transverse outline almost oval.
- Dorsal surface brightly olive green and ventral surface is orange yellow or black & yellow.
- Black stripe marks on median longitudinal at dorsal side of the body

#### SUCKERS:

Hollow muscular organs on each end of the body are known as sucker.

(1) **Anterior sucker (Oral sucker)** (Cephalic sucker): Comprised of cup like hollow, pre oral chamber and the mouth. It contains 3 jaws with sharply serrated edges, which are used like circular saws, and on them are about 100 horny teeth used to incise the host.

(2) **Post sucker (Anal sucker):** It's highly muscular disc like structure, formed by fusion of 7 body segments (26th to 33rd).

**Systemic Information:** H. medicinalis breeds once during an annual season that spans June through August. It also remains fertile over a period of years, unlike most other Leech species. The act of copulation takes place on land, where one Leech attaches ventrally to one another by means of a mucus secretion. All Leeches are hermaphroditic (Have both Male and Female reproductive organs) and fertilization is internal. Sperm is injected into the vagina by an extendable copulatory organ.

**Respiration:** Respiration takes place through the body wall, and a slow undulating movement observed in some Leeches is said to assist gaseous exchange. Aquatic Leeches tend to move to the surface when they find themselves in water of low oxygen content. As a fall in atmospheric pressure results in a small decrease in dissolved oxygen concentrations, rising Leeches in a jar of water provided nineteenth century weather forecasters with a simple way of predicting bad weather.

**Feeding:** Most Leeches are Sanguivorous that is they feed as blood sucking parasites on preferred hosts. If the preferred food is not available most Leeches will feed on other classes of host. Some feed on the blood of humans and other mammals, while others parasitise fish, frogs, turtles or birds. Some Leeches will even take a meal from other sanguivorous Leeches which may die after the attack. Sanguivorous Leeches can ingest several times their own weight in blood at one meal. After feeding the Leech retires to a dark spot to digest its meal. Digestion is slow and this enables the Leech to survive during very long fasting periods (up to several months).

**Digestive:** *Hirudo Medicinalis* is parasitic and the adults feed on the blood of mammals. It attaches to the host by means of its two suckers and bites through the skin of its victim. It has three jaws, which work back and forth during the feeding process, which usually lasts about 20 to 40 minutes and leaves a tripartite star-shaped scar on the host. Three jaws that look like little saws, and on them are about 100 horny teeth used to incise the host. Young *Hirudo* feed on frogs and not mammals, since their jaws are not strong enough to cut through mammalian skin, while adults feed on mammalian blood. Leeches only feed about once every six months; this is about how long the blood meal takes to be fully digested. Leech may even go longer than six months without food by digesting its own tissues. Bacteria that live within the Leeches' body help keep the blood from decomposing. Sometimes, when blood is not easily available, it may go even longer on a fast, digesting its own tissues.

**Circulatory:** There is a tendency in this group toward the loss of true blood vessels. The blood of some Leeches is red. In others the blood lacks oxygen-carrying pigments and is therefore colorless; the oxygen dissolved directly in the blood is sufficient for respiration. Gas exchange occurs through the body surface of most Leeches, although many fish-parasitizing Leeches have gills.

#### **CHEMICAL CONSTITUENTS OF SALIVA**

The Leech produces a number of important substances which contribute to the special property of the bite, including an Anticoagulant, a local Vasodilator and Local Anesthetic like Hirudin, Hyaluronidase, Hementin etc. Here therapeutic effect is not only released by loss of blood but also by the secretions which the Leech emits in to the lesion. They secrete anticoagulants to

prevent blood clots and relieve pressure due to pooling blood. Leech saliva helps reestablish blood flow to reattached body parts by means of a vasodilator, provides a numbing anesthetic, and lessens the risk of infection due to an antibiotic. These substances allow continued bleeding normally up to 10 hours after the animal has detached. Research indicates that after about 3 to 5 days, new vessel ingrowths around flap margins develop sufficiently to restore effective venous drainage. Therefore, it is important that treatment is not terminated too soon, but rather, continued over a period of time to avoid failure. The property of the each bite cut to continue bleeding, with encouragement, for 10 or more hours is related to pharmacologically active secretions (not the anticoagulant alone) introduced by the Leech bite.

**Hirudin:** It was recognized in the saliva of Leeches in 1884. It was used in early transfusion experiments 30 years before Heparin was used. Since 1986, when Hirudin was genetically engineered, interest has been recharged in the drug as a systemic anticoagulant free of some of heparin's side effects. It is also termed as anti-coagulin. It also works as diuretic and antibiotics. It keeps the wound opened for the approximately 30 minutes sucking act and keep the blood fluidly. Hirudin (mainly from Leech) having approximately three times more anti-thrombin activity than Pseudohirudin. The results of early clinical studies suggest that hirudin and hirulog may be more efficacious and more predictable and may have fewer bleeding complications than heparin for several clinical indications.

**Calin:** It also prevents the blood coagulation. On comparison with hirudin it has a substantially longer times of period within which it is effective and takes care of the 12

hours cleansing of the wound by a secondary hemorrhage.

**Destabilase:** It is endo-epsilon-(gamma-Glu)-lys isopeptidase protein from medicinal Leech. It inhibits arterial thrombus formation in rats by inhibition of induced and spontaneous platelet aggregation and also reported that it also completely blocked the spontaneous aggregation of human platelet.

**Hyaluronidase:** An enzyme called hyaluronidase, which breaks down hyaluronic acid, the bonding material of connective tissue, thus fostering the flow of blood and fluids from affected areas. It is "spreading factors" that ensures that the other active substances which are active at the bitten areas can be spread. Antithrombin, antitrypsin and antichymotrypsin activities were found in the salivary gland secretion and intestinal chyme of medicinal Leech. High antithrombin activity was maintained in starved Leech.

**Piavit:** It contains Leech prostanoids and highly purified destabilase fraction. It has protective antithrombotic effects. The active Leech substances totally block the enzymic process activated and often exceeding within inflammation or traumas. The salivary glands of Leeches also produce cornucopia of other pharmacologically active substance including an antihistaminic, protease and possibly, an anesthetic and antibiotic.

Other ingredient of Leech saliva includes Hirustasin inhibits kallikrein, trypsin, chymotrypsin. Bdelins- anti-inflammatory, inhibits trypsin, plasmin. Hyaluronidase increases interstitial viscosity, Tryptase inhibitor inhibits proteolytic enzymes of host mast cells. Eglins- Anti-inflammatory, inhibit the activity of alpha-chymotrypsin, chymase, substilisin. Factor Xa inhibitor- Inhibits the activity of coagulation factor xa by

forming equimolar complexes, Complement inhibitors- May possibly replace natural complement inhibitors if they are deficient, Carboxypeptidase A inhibitors- Increases the inflow of blood at the bite site, Vasodilator increases the inflow of blood at the bite site, Acetylcholine- Vasodilator

#### Indication

Leech therapy is mainly practised in following medical conditions:

**Skin Diseases-** Acne, Eczema, Psoriasis, Skin Cancer, Erythematousus , Allergies, Rosacea, Scabies,

**Nervous System-** Alzheimer Disease, Ankylosing Spondylitis, Anorexia Nervosa, Epilepsy, Parkinson Disease, Narcolepsy, Motor Neuron Disease, Multiple Sclerosis, Muscular Dystrophy, Cerebral Palsy, Bedwetting, Attention Deficit, Hyperactivity Disorder,

**CVS-** Pulmonary Disease,

**RS-** Asthma, Whooping Cough, Tuberculosis,

**Musculoskeletal System-** Arthritis Rheumatoid, Back Pain, Hypertrophy, Osteoporosis, Polymyalgia Rheumatica,

**Genital System-** Benign Prostatic, Endometriosis, Genital Warts, Genital Herpes, Gonorrhea, Ovarian Cancer, Polycystic Ovary syndrome, Postnatal, Cervical Cancer, Chlamydia, Testicular Cancer, Thrush

#### CONTRAINDICATION:

Absolute-Hemophilia, Relative-Pregnancy, Anemia, Hypotonic conditions. In the words of Prof. Charles Lent, leading Biologist of U.S., Leeches are useful in removing the blood from areas where tissue has been transplanted or reattached. Because when blood accumulates, tissue may die before it heals. Applying Leeches to the area once or twice a day for a week gives time to the capillaries to grow across sutures and restore blood circulation. Though, we

are able to substitute better coagulants than Hirudin, in the peak of medical innovations the importance of Leeches are not washed out. The words of Sushruta are becoming a reality even after 2000 years of change in events that the physician having the art of Leech application will be a successful once crossing the boundaries of time and space.

## CONCLUSION

There are various types of Jalaukas (Leeches) have been mentioned in Ayurveda since immemorial and it is a useful Para surgical tool for Ayurvedic Physician and using in various clinical as well as in surgical condition. There are various types of enzymatic factors are proven scientifically which are essentials to cures the various disorders.

“The clinician who knows all about the Leeches, Habitat, and their method of Collection, Varieties, Storage and Method of Application is successful in treating the diseases amenable to them”

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Declared

