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**Medicinally Important Leeches Of Melghat Region: And Their Role  
In Medical Therapeutics**

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**Abstract:**

The aim of this study was to reveal diversity patterns of medicinally important leech communities. In this investigation 32 free living as well as parasitic species were examined. Most of the specimens were collected from the river at Seemadoha of Melghat region. The communities were analyzed with respect to their medicinal and therapeutic properties. Medicinal leeches contain more than 100 bioactive substances include vasodilator, analgesic, anti-inflammatory, bacteriostatic anticoagulants, anti-edematous, which eliminate microcirculatory disorders, restore the damaged vascular permeability of tissues and organs, eliminate hypoxia, reduce blood pressure, increase immune system activity, resolving the cause of pain and improve the bioenergetics status of the organism.

The study highlights morphology of medicinally important species collected from the river at Seemadoha, Melghat area. The uniform pattern in citation and arrangement of segment was observed. Silent features, Diagnostic characters were examined from the key of identification of genera and species. Out of total samples collected, 2 leech species were identified which are medicinally important, mainly these leeches belong to *Hirudidae* family and genus *Poecilobdella Blanchard* and *Asiaticobdella birmanica*.

**Keywords:** Medicinal leeches, Hirudotherapy, Bloodletting, venous congestion

**Introduction**

Leeches (Hirudinea) are predatory parasitic annelids with terminal suckers serving in attachment, locomotion and feeding. They are closely related to the oligochaeta and resemble the epizoic Branchiobdellidae in possession of suckers, median orifice and analogous jaws in the absence of setae (Moore, 1958). They are recognized as a very important macro invertebrate group of versatile habits and habitats. India is one among the 12 mega biodiversity countries of the world. Biological diversity reveals that Leech (Hirudinea) fauna of the world accounts to 680 species, of these 482 species are freshwater, 102 marine and remaining 92 species are terrestrial (Moore, 1958). Uptill now Leech fauna is represented by 64 species from Indian region (ZSI). A small number of sanguivorous species known as “medicinal leeches” have played an important role in traditional and modern medicine. Blood leeching is an ancient method of bloodletting which has been used extensively in treatment of various disorders since centuries in the natural medicine. The substance extracted from the saliva of leech is power anticoagulant. Fritz Marquardt of Germany isolated a protein from *Hirudomedicinalis* that is called as hirudin (Bodong, 1905; Electricwala *et al.*, 1991). It is heparin-like substance and most potent known natural inhibitor of thrombin. He also demonstrated its thrombin inhibitor effect. Scientific research reveals the benefits of leech application and injection of several medicinally useful bioactive molecules present in their saliva (Adams 1988, Engemann *et al.*, 1981). Major known enzymes in the saliva of the leeches are anti-coagulant, anti-inflammatory, anti-edematous and analgesic in nature (Whitaker *et al.*, 2004). Hirudotherapy (application of leeches for medical purpose) is the new modality of treatment employed in the advanced surgical and medical sciences. US FDA has approved the use of leeches for medicinal purpose in 2004. The significance of leeches in ecology and medicine needs no emphasis.

**Material and Methods**

Leeches were collected from different localities of river and ponds of Seemadoha, Melghat region. Collected leeches were kept in the laboratory without food at 20 °C in the dark avoiding direct sunlight. They were kept in suitable containers with sufficient dechlorinated tap water. The water was changed every other day. Sudden changes in temperature were avoided when transferring leeches from one container to another. Since leeches are amphibious and like to crawl about, a lid over container is essential. Leeches are small. The elastic leech body is capable of going through remarkable small opening. The top of the container was covered with cloth and tightly secured with string, rubber band or tape. Not more than twenty leeches were kept in a two container. For comparative purposes, we examined specimens of *Poecilobdella Blanchard* and *Asiaticobdella birmanica* collected from the river and ponds

Seemadoha of Melghat region. Only mature specimens were examined. The above mentioned medicinally important leeches were identified from the Identification key.

**Diagnostic characters:**

***Poecilobdella Blanchard:*** The size of the species is medium to very large. Form generally robust, widest near middle and tapered little to the end. The general form of this species is similar to that of *Poecilobdella granulosa*, Colour is green and pattern disintegrated more completely earlier in life. The black pattern is chiefly limited to transverse rows of mid metameric spots. Dorsal portion is bright olive-green and ventral in greyish-green, sharply separated by bright marginal orange stripes. Head is broad. The lip marked on the venter by a median furrow. Posterior sucker is more or less small. Gonopores separated by five or seven annuli. Preclitellar region depressed, more than twice as wide as deep, gradually increasing in width. Annulation distinct, no vesicles. Clitellar region separated from preclitellar by a slight constriction and furrow, rather sharply defined by its reddish color and composed of eight annuli, of which the last three bear the first pair of pulsatile vesicles. Gonopores separated by two annuli, one large and one small. Male pore a large transverse, crescentic, slit between the second and third clitellar annuli, the female a minute pore between the fourth and fifth. annuli. Jaws with more than one hundred acute, monostichodont teeth.

***Asiaticobdella birmanica:*** Size of the species is small to medium (5 to 7cm long), slender and small-headed. Number of body segments XXXII. Anterior sucker small and posterior sucker is medium size. Jaws short and high bearing 45 to 60 teeth. Body coloration with specific striped color pattern on the dorsal, Blackishgreen interrupted longitudinal striped pattern on the yellowish green body coloration on the dorsal and ventral body surface with dark brown color; along the margin of the ventral plane surface is a dark yellow longitudinal band from anterior to posterior sucker, such specimen of all size were collected as roughly identified as *Asiaticobdella birmanica*. Final identification was done in the laboratory and confirmed as *Asiaticobdella birmanica* (Blanchard, 1894) after the reference of 'Classification, Ecology and Behaviour -(Sawyer, 1984 8b 1986). In the present leech species there are 32 post oral segments, caudal sucker has seven segments and the caudal sucker is narrow in diameter than the maximum width of body. Another important character is the individuals are not having the true vascular system. The leeches are most elastic to extend their length of body during formation (reaping) on the ground and ribbon shaped body with wave like movement in water due to presence of botryoidal tissue in the body musculature.





Posterior sucker



Anterior sucker

**Discussion:**

Different organisms like mouse, rat, guinea pigs, drosophila are used as research models in various scientific fields and their taxonomy is very clearly defined. In this respect, the medicinal leech appears to be an exception as their taxonomy is still neglected. There is a little information on medicinal leeches in the wild and most of the studies are laboratory studies. The typical habitat is a pond with a muddy substratum, littoral vegetation, and a high summer temperature. Most of the leech species are reported as feeding almost exclusively on the blood of mammals. Earlier leech taxonomists have stated that coloration as a misleading character. According to their point of view, all different coloration types are just variations of the same species *H. medicinalis* (e.g., Lukin 1976). Recent molecular systematic investigations (Trontelj et al. 2004; Trontelj and Utevsky 2005) have corroborated the coloration pattern as the crucial clue to distinguish between good biological species of the genus *Hirudo*. Knowing this, the identification of medicinal leech species is relatively straightforward.

In India the species used for leech therapy are *Macrobdeella decora* (American medicinal leech), *Hirudomichaelseni*, *Hirudonipponia*, *Hirudo verbena* and *Hirudoorientalis* 5-9. It would be interesting to know more about the ecology and distribution of medicinal leech species. In the present study we have identified two species which belong to the hirudae family which showed different color patterns, longitudinal stripes and metamerous spots. Their identifying characters and jaw pattern reveals that these leeches could be used for therapeutic purposes.

**Conclusion:** Despite the variations in leech taxonomy around the globe, each and every medicinally important leech species is important for leech therapy and it remains useful to modern medicine. Further research on medicinally important leeches and their

biologically active compounds from the saliva of sanguivorous leech species, including *Hirudinaria granulosa* (Indian medicinal leech) or *Hirudinaria manillensis*, is important.

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