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IDENTIFICATION KEY OF WEST BENGAL LEECHES (ANNELIDA : HIRUDINEA)

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INTRODUCTION

As in animal kingdom every organism has a specific importance under non-chordate group, leeches have also great importance both in taxonomy and medicinal field. Jalaukas the name of leech is in "Susruta", Jalauka in "Mahabharata" Jaluka in Sanskrit, Jaru in Sindhi, and Juku in Nepali. Due to medicinal value and venomous quality leeches are becoming attractive to human beings, so many scientists are engaged to discover the leeches. Leeches are very important so far regulation of size and shape of the invertebrate communities is concerned. They, on way of sucking blood from cattle, reptiles, amphibians and fishes transmit the blood parasites and thereby inviting trypanosomiasis and helminthiasis in these animal groups.

More than 549 species of leeches are reported from the world (Bondyopadhyay, P.K. and Mandal, C.K. 2006) of which about 63 species have so far been recored in Indian region. In West Bengal, however 28 species are now known to occur in varied ecological conditions from plains to the mountains, low to heavy rainfall areas and from river bed to ponds. Some species live permanently in water while others in dampy bushes under rotten leaves, bricks and stones.

Leeches never destroy agriculture crops, fruits and vegetations and only subsist on blood of various animals. Sometimes they take small insect larvae.

The present study is based on the material collected by the author from different districts of West Bengal during 1990-2003.

The material is represented by 28 species belonging to 13 genera under 4 families. Of these, 3 species are new in the world and 7 forms have new locality record, Mandal (2004-2006).

Harding and Moore (1927) provided a comprehensive account of the Indian leeches. The other workers like Baugh (1960) and Sanjeeva Raj and Gladstone (1981) contributed their mights to the taxonomy of this group.

MATERIAL AND METHODS

The bulk of the materials dealt with the present materials were collected by me during 15 years (1990-2005) taking personal endeavour in West Bengal. All the material so collected has been deposited in the National Zoological Collection (N.Z.C.) of India at the Zoological Survey of India, Calcutta. The rest of the materials including the "types" have been selected from the extensive collection present at the N.Z.C. of India. Collections were made from all districts of West Bengal. Hilly area, dry area, river, ponds, lakes, marshy land, plain land, national park, tiger reserve, were the target collection spot.

The field observations and collections were made during all the seasons of year. In course of survey almost all niches are taken into consideration to find out the leech individuals occurring in the habitat/ecosystem. A sampler is used to collect the specimens. A net hangs from a quadrangular body, made of still. Each arms of the structure is 30 cm. and a handle of steel is attached in the middle of one arm of the quadrangular structure. In the case of free-living species five sites from a selected ecosystem (water body) are taken into consideration to note the number of leeches occurring in the system. From each site/station an area of 30cm. square, has been selected at random and the number of leeches occurring there, are counted. The mean of such five readings are considered for actual population density per 30 cm. square, which will be computed into no/ m^2. In case of parasitic and malacophagous leeches, attempts have been made to note the number of leeches attached with the host body. In such case five or more host individuals are taken into account at random and mean would be considered for population density of this external parasite per host. The malacophagous leeches are counted on the basis of samplings of pelagic molluscs from an area of 30 cm. square from the concerned water body. Also in this case five such samplings are taken and the leeches attached/infested with snails are counted and mean of the five readings have been considered for the final data. In course of such studies, soil and water samples were collected to study some of the important factors of the environment. The climatic factors have also been recorded from the meteorological stations at district headquarters. The pH of water samples was recorded with the help of pH indicator instrument. Breeding seasons of leeches are determined on the basis of observation of the egg, young and mating activities. The leeches are narcotized and preserved following the method recorded in the book entitled, "Hand Book for Zoological Collectors" published by the Director, Zoological Survey of India, Calcutta (1985).

The samples were preserved in 70% alcohol after necessary narcotization. Preserved samples were sorted very carefully using binocular. Immediately after collection, the material was washed in pond water or in any fresh water and allowed to relax in water mixed with drops of 70% alcohol for about 2 hours to avoid twisting or breaking. For the good dissection, specimens are kept in 4% formalin for 24 hours and then transferred to 70% alcohol after proper washing in fresh water for preservation. It is necessary to dissect and examine the caeca, epididymis, and vaginal duct of the specimens for taxonomic study.

SYSTEMATIC ACCOUNT

Phylum ANNELIDA

Class CLITELLATA

Order HIRUDINEA

Suborder RHYNCHOBDELLAE

I. Family ICHTHYOBDELLIDAE

1. Genus ***Ozobranchus*** Quatrefages, 1852

1. *Ozobranchus shipleyi* Harding, 1909

II. Family GLOSSIPHONIDAE

2. Genus ***Glossiphonia*** Johnson, 1816

*2. *Glossiphonia annandalei* oka, 1921

3. *Glossiphonia weberi* Blanchard, 1897

*4. *Glossiphonia heteroclita* (Linnaeus, 1761)

*5. *Glossiphonia reticulata* Kaburaki, 1921

3. Genus ***Helobdella*** Blanchard, 1896

6. *Helobdella nociva* Harding, 1924

4. Genus ***Hemiclepsis*** Vejdovsky, 1883

7. *Hemiclepsis marginata marginata* (Muller, 1774)

8. *Hemiclepsis marginata asiatica* Moore, 1924

5. Genus ***Paraclepsis*** Harding, 1924

9. *Paraclepsis praedatrix* Harding, 1924

10. *Paraclepsis gardensi* Mandal, 2004

6. Genus ***Placobdella*** Blanchard, 1893

11. *Placobdella emydae* Harding, 1920

12. *Placobdella fulva* Harding, 1924

13. *Placobdella harasundarai* Mandal, 2004

14. *Placobdella horai* Baugh, 1960

*15. *Placobdella undulata* Harding, 1924

Suborder ARHYNCHOBDELLAE

III. Family EROPOBDELLIDAE

7. Genus ***Nematobdella*** Kaburaki, 1921

16. *Nematobdella indica* Kaburaki, 1921

8. Genus ***Herpobdelloidea*** Kaburaki, 1921

17. *Herpobdelloidea lateroculata* Kaburaki, 1921

9. Genus ***Barbronia*** (Blanchard) 1897

*18. *Barbronia weberi* (Blanchard, 1897)

IV Family HIRUDIDAE

10. Genus ***Dinobdella*** Moore, 1927

19. *Dinobdella ferox* (Blanchard, 1896)

11. Genus ***Poecilobdella*** Blanchard, 1893

20. *Poecilobdella granulosa* (Savigny, 1820)

21. *Poecilobdella manillensis* (Lesson, 1842)

12. Genus ***Hirudo*** Linnaeus, 1758

22. *Hirodo birmanica* (Blanchard, 1894)

V Family HAEMADIPSIDAE

13. Genus ***Haemadipsa*** Tennent, 1859

23. *Haemadipsa montana* Moore, 1927

24. *Haemadipsa ornata* Moore, 1927

25. *Haemadipsa sylvestris* Blanchard, 1894

26. *Haemadipsa zeylanica agilis* Moore, 1927

27. *Haemadipsa zeylanica montivindicis* Moore, 1927

*28. *Haemadipsa kodairensis* Bandyopadhyay and Mandal, 2006

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*Recorded for the first time from West Bengal.

Key to the Families

Body ovate, flattened; anterior suckes ventral and fused with the body; posterior sucker cupuliform, distinct from rest of the body; eyes confined to head; three annuli per mid-body segment; qastric caeca present ..... Glossiphonidae

Body cylindrical and usually divided into distinct anterior and posterior regions; anterior sucker usually distinct; posterior sucker large discoid organ and marked off from the body. Usually more than three annuli per segment; eyes may be present on head nock..... Ichthyobdellidae

Eyes 3-6 pairs in labial and buccal groups in two transverse rows; pharynx long; mouth with muscular ridges but without jaws; testes sacs small and numerous; gastric caeca absent .... Erpobdellidae

Eyes 5 pairs forming lateral crescent; pharynx short; mouth with toothed jaws; tests arranged segmentally in pairs; gastric caeca present ..... Hirudidae

Land and terrestrial leeches only; size small to medium; complete somites; third and fourth pairs of eyes usually on contaguous annuli; buccal fril and anal appendages usually present ..... Haemadipsidae

Key to the species of **Leeches**

Ozobranchus shipleyi Harding, 1909
- I. Eleven pairs lateral digitate branchiae.
- II. Branchiae colour less and body dull yellow.
- III. Eyes on ring 5.
- IV Female ducts open by a common pore between ring 19 and 20.

Glossiphonia annandalei Oka, 1921
- I. The three pairs of eyes has a position unique among the glossiphonidae family.
- II. Two pairs of eyes lie in the posterior part of ring 4.
- III. Smaller pair of eyes lies in between the larger Pair.

Glossiphonia weberi Blanchard, 1897
- I. Larger forms attain a length of about 12 mm.
- II. Colour grayish white to light orange.
- III. Five longitudinal rows of dark brown spots.
- IV Dorsal surface bears seven longitudinal rows of prominent papillae.
- V Eyes three pairs on ring 6, 7 and 8.
- VI. Six pairs of sublobate lateral caeca.

Glossiphonia heteroclita (Linnacus, 1761)	I. Three pairs of eyes lies in rings 5, 7 and 8. II. The body is ovate acuminate, flatend, smooth, transparent. III. The first and smallest pair of eyes closely approximated.
Glossiphonia reticulata Kaburaki, 1921	I. Two pairs of eyes in ring 4 and 5. II. Caudal sucker small. III. Three longitudinal rows of sensory papillae (one median and two intermedians).
Helobdella nociva Harding, 1924	I. Colour dull green but usually white in preserved state. II. Dorsal surface with five brown Longitudinal stripes. III. Papillae two pairs on dorsal side. IV Eyes one pair on ring 4. V Crop with six pairs of simple lateral caeca.
Hemiclepsis marginata marginata (Muller, 1774)	I. Flattened translucent body is richly pigmented. II. Seven longitudinal rows of lemon-yellowspots on dorsal surface. III. Two pairs of eyes are on ring three and four. IV Male and female pore opens between ring 29 and 30.
Hemiclepsis marginata asiatica Moore, 1924	I. Eyes two pairs on rings 3 and 4 but anterior pair very minute. II. Head region dilated and distinct from rest of the body. III. Transverse stripes broken, pale yellow in colour found on the dorsal surface.
Paraclepsis praedatrix Harding, 1924	I. Three pairs of eyes are disposed in two sub-parallel rows in rings 3, 4 and 7. II. Ovate-acuminate body. III. Roughened dorsal surface due to numerous small papillae closely set on every ring.

Paraclepsis gardensi Mandal, 2004	I. Eyes three pairs (2nd pair largest). II. Stomach with seven pairs of caeca (Branched and leafy). III. 18 greenish brown sub parallel longitudinal lines on the dorsal side 6 mid ventral. IV A bulb shaped structure on the dorsoventral part of the anterior portion of the body.
Placobdella emydae Harding, 1920	I. Larger forms attain a length of 13 mm. II. Elliptic body with head region dilated. III. Three pairs of papillae on dorsal surface. IV Male and female pores open between rings 26/27 and 28/29 respectively. V Mouth opens terminal.
Placobdella fulva Harding, 1924	I. Body flattend but very slender anteriorly. II. Upper surface bright reddish-yellow but ventral surface white. III. Each ring bears a large median papilla. IV Eyes one pair on ring 2. V Head region continuous with the body.
Placobdella harasundarai Mandal, 2004	I. One pair round eyes. II. Green in colour in living. III. Three lines dorsal papilla palpable. IV Eggs seven to ten in number. V One mid ventral line. VI. Anterior sucker triangular in shape. VII. Anterior sucker is one fourth of the posterior sucker.
Placobdella horai Baugh, 1960	I. Body ovate acuminate. Upper surface light brown. II. Papillae small, closely set on dorsal surface. III. Eyes one pair, closely placed. IV Male and female pores open between rings 24/25 and 26/27 respectively.

Placobdella undulata Harding, 1924	I.	Head region some what dilated and distinct from body.
	II.	Dorsal surface with a roughened appearance due to numerous closely set papille.
Nematobdella indica Kaburaki, 1921	I.	Larger forms attain a length of about 20 mm. very slender.
	II.	Colour bright buff when alive.
	III.	Six pair eyes, first pair larger on somite 111 remaining five pairs smaller.
	IV	Gonopores separated by five annuli.
Herpobdelloidea lateroculita Kaburaki, 1921	I.	Larger forms attain a length of 27 mm.
	II.	Very slender, attenuated anteriorly.
	III.	Eyes five pairs to six, the first pair larger and dorsal on somite IV
	IV	Remaining submarginal on somites V to VIII.
	V	Gonopores separated by two and one-half to three annuli.
Barbronia weberi (Blachard, 1897)	I.	Size, 25-35 mm. long.
	II.	Colour grayish brown in living.
	III.	Eyes three pairs, one large pair on dorsum of 11.
	IV	Two smaller pairs on sides of anterior annulus of IV
	V	Gonopores separated by four and half annuli.
	VI.	Accessory copulatory pores at X/XI.
Dinobdella ferox (Blanchard, 1896)	I.	Size very large from 20 to 25 cm. or more in life.
	II.	Colour dark green, with any markings.
	III.	Head small, caudal sucker very large.
	IV	Jaws small and no teeth.
Poecilobdella granulosa (Savigny, 1820)	I.	Colour olive green with one or two pairs of yellowish longitudinal stripes marked by black broken line.
	II.	Gonopores separated by five annuli.
	III.	Penis sac larger than prostate.

Poecilobdella manilensis (Lesson, 1842)	I. Body larger and robust. II. Colour light green ventrally and brown dorsally. III. Four pairs olive green stripes on dorsal area disappears with the increasing of size. IV Vaginal stalk absent. V Gonopores separated by five annuli like granulose.
Hirudo birmanica (Blanchard, 1894)	I. Slender body, length about 70 cm. II. Head small and colour brown with seven dark brown dorsal stripes. III. Vaginal sac fusiform, without caecum.

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Haemadipsa montana Moore, 1927	I. 35 mm. long, slender, cylindrical body. II. colour yellow to buff with median dorsal black stripe. III. One pair of black chain stripe. IV. Third and fourth pair of eyes separated by complete or partial annulus.
Haemadipsa ornata Moore, 1927	I. Size medium. II. Velvety black cream coloured stripes on dorsal area of the body. III. One median and a pair of black intermediate stripes. IV Reddish colour ventrally, sucker pale blue. V Sucker rays 86-94. VI. Eyes 3 and 4 usually separated by a complete annulus.
Haemadipsa sylvestris Blanchard, 1894	I. Larger forms about 50mm. long. II. Colour brown with three dorsal black stripes. III. Third and fourth pair of eyes separated by a complete annulus.
Haemadipsa zeylanica aqilis Moore, 1927	I. Small size, slender body. II. crown brown, with black stripe. III. Median head tessellae present. IV Dorsal intermediate papillae prominent.

Haemadipsa zeylanica montivindicis Moore, 1927	I.	Size small, slender, cylindrical body.
	II.	Colour yellowish-brown with mid-dorsal field paler and a continuous black median line.
	III.	Median head tessellate and dark blotched pattern absent.
Haemadipsa kodairensis Bandyopadhyay and Mandal, 2006	I.	Black spots all over the body, clitellum rudiment.
	II.	Stomach three chambered, Vaginal stalk short.
	III.	Caecum rudimental.

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