



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(4): 605-609

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Received: 16-05-2020

Accepted: 18-06-2020

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Distribution of aquatic and terrestrial leeches in Assam, India

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Abstract

Leeches are well known as haematophagous parasite for both man and animals. A study was conducted to record the prevalence of both aquatic and terrestrial leeches in fifteen districts of Assam viz., Goalpara, Chirang, Bongaigaon, Barpeta, Baksa, Nalbari, Darrang, Kamrup, Nagaon, Golaghat, Jorhat, Sivasagar, Dibrugarh, Tinsukia and Lakhimpur for a calendar period from August 2014 to September 2015. A total 1991 number of both aquatic and terrestrial leeches were collected during the period of study. Five different aquatic leech species e.g., *Hirudinaria manillensis* (57.86%), *H. granulosa* (11.85%), *H. javanica* (2.71%), *Whitmania laevis* (2.61%) and *Hemiclepsis marginata* (0.80%) and one single terrestrial leech i.e., *Haemadipsa sylvestris* (24.16%) was found to be prevalent variously in different districts of Assam. The present findings will help in further detailed study on the prevalence of other species of leeches.

Keywords: Aquatic, Assam, leech, prevalence, terrestrial

Introduction

Leeches are predatory parasitic annelids with terminal suckers serving in attachment, locomotion and feeding. They are closely related to the oligochaeta^[1]. They are recognized as a very important macro invertebrate group of versatile habits and habitats. They are characteristically modified for procuring and digesting their food, which is typically of blood and other animal juices but also smaller annelids, snails, insect larvae and organic ooze. They are both terrestrial and aquatic. Aquatic species are found in freshwater, brackish and marine water. Ponds, lakes, streams and paddy fields are their favourite fresh water habitats. Sometimes, leeches are found to attach with the animal body surface and sometimes with the plants. Lower leaf of plants, stems and root of the floating plants are the favourite resting sites of leeches. Marine and brackish water leeches usually remain attached at the ventral region of the animals^[2]. Land leeches are generally referred to a group of sanguivorous species belonging to different genera that mainly live in the Indo-Pacific region. These leeches were adapted to terrestrial life, but are restricted to damp forests with high humidity because of their blood feeding habit. Therefore, the majority of the land species are distributed in tropical and subtropical areas^[3]. There are few literatures regarding the detailed study of prevalence of leeches in Assam, India. So, the present study was undertaken to record the prevalence of both aquatic and terrestrial leeches in Assam.

Materials and Methods

To study the prevalence of both aquatic and terrestrial leeches, a total fifteen districts of Assam were randomly selected. These districts were Baksa, Barpeta, Bongaigaon, Chirang, Darrang, Dibrugarh, Goalpara, Golaghat, Jorhat, Kamrup, Lakhimpur, Nagaon, Nalbari, Sivasagar and Tinsukia. The study was conducted from August 2014 to September 2015. The laboratory work was conducted in the Department of Parasitology, C.V.Sc., AAU, Khanapara, Guwahati, Assam. For the present study aquatic leeches were collected from different wetland types and also from paddy field by hand picking and brought to the laboratory. Leeches were reared in large glass jars containing water up to 2/3rd of the jars in the laboratory. They were maintained at 12 hr light and 12 hr dark cycle by putting dark cloths around the jars for 12 hr for the dark cycle. Jars were cleaned by changing water at two days interval. Similarly, terrestrial leeches were collected from grazing lands, backyard kitchen gardens, floor of damp forested areas and

also from the leech affected animal and human being. In the laboratory, they were reared in large sized containers with a moist soil bed. The lids of the containers were perforated for passage of air. The moisture of the soil was maintained by slightly drizzling with water on alternate days. The containers were kept in cool and shady area of the laboratory. Live leeches were very motile. For identification representative specimens were placed in large sized glass petridishes. Then they were narcotized by adding 70% alcohol drop by drop. When they were immobilized and naturally stretched, the specimens were then preserved in 10% formalin and identified on the basis of their morphological characters.

Results and Discussion

The result has been presented in Table 1. and Fig 1. Accordingly, a total 1991 number of both aquatic and terrestrial leech was collected during the period of study. Five different aquatic leech species were found prevalent variously in the districts, e.g., *Hirudinaria manillensis* (Fig 2 and Fig 3), *H. granulosa* (Fig 4 and Fig 5), *H. javanica* (Fig 6 and Fig 7), *Whitmania laevis* (Fig 8 and Fig 9) and *Hemiclepsis marginata* (Fig 10 and Fig 11), their percent prevalence being 57.86, 11.85, 2.71, 2.61 and 0.80, respectively. A single species of terrestrial leech i.e., *Haemadipsa sylvestris* (Fig 7) was found prevalent in all the districts, the percent prevalence was 24.16. From Table 1 and Fig 1 it becomes apparent that *H. manillensis* was the most prevalent species amongst the five species of aquatic leeches, followed by *H. granulosa* and *H. javanica*. *W. laevis* was found in only two districts i.e., Goalpara (46.51%) and Darang (7.14%). On the other hand *H. marginata* (22.22%) was found in Nagaon district only.

Various authors had recorded the occurrence of aquatic and terrestrial leeches from India [4-11] and also from abroad [12-14]. Taxonomic details and availability of both aquatic and terrestrial leeches found in the Indian sub-continent is also recorded [15]. The present finding is in conformation with the records as mentioned above. 69.31 per cent prevalence of *H. manillensis* from the state of Assam is recorded [11], whereas in the present study the percent prevalence of *H. manillensis* was found 57.86. This difference might be due to sampling variation. *H. manillensis* is an aggressive species. Animals and birds during contact with marshes, tanks or waterlogged bodies for drinking water or human being during the plough and other occupational activities related to water gets easy victim of aquatic leech attack. Similarly, terrestrial leech pester both animals and men related to activities in forest floor, grasslands and fodder plots etc. There are various instances of severe leech attack on domestic animals, birds and men [11, 15-33].

Haemadipsa sylvestris is a common terrestrial haematophagous leech found in Assam. The species was also recorded from other parts of India [4-11] and also been from Thailand [13]. Probably there are suitable breeding habitats in the areas for the propagation of this common terrestrial leech species.

The geographical distribution of *Whitmania laevis* was recorded by several workers in India [1, 34] and also in Nepal [7]. Recently, the prevalence of *W. laevis* is recorded from the state of Assam [1]. Present findings have showed that, the species prevalence was low and distributed in two districts only.

Table 1: Prevalence of Aquatic and Terrestrial Leech Species in 15 Different Districts of Assam from August 2014 to September 2015

Sl. No.	Districts	Leech species						Total
		Aquatic					Terrestrial	
		<i>Hirudinaria manillensis</i> (%)	<i>H. granulosa</i> (%)	<i>H. javanica</i> (%)	<i>Whitmania laevis</i> (%)	<i>Hemiclepsis marginata</i> (%)	<i>Haemadipsa sylvestris</i> (%)	
1.	Barpeta	424 (57.45)	76 (18.29)	26 (3.52)	0 (0.00)	0 (0.00)	212 (28.73)	738
2.	Baksa	40 (51.28)	22 (28.21)	0 (0.00)	0 (0.00)	0 (0.00)	16 (20.51)	78
3.	Bongaigaon	34 (51.52)	16 (24.24)	0 (0.00)	0 (0.00)	0 (0.00)	16 (24.24)	66
4.	Chirang	20 (55.56)	8 (22.22)	0 (0.00)	0 (0.00)	0 (0.00)	8 (22.22)	36
5.	Darrang	94 (55.95)	36 (21.43)	16 (9.52)	0 (0.00)	0 (0.00)	10 (5.95)	168
6.	Dibrugarh	52(81.25)	0 (0.00)	0 (0.00)	12 (7.14)	0 (0.00)	12 (18.75)	64
7.	Goalpara	20 (23.26)	6 (6.98)	0 (0.00)	0 (0.00)	0 (0.00)	20 (23.26)	86
8.	Golaghat	44 (67.69)	6 (9.23)	0 (0.00)	40 (46.51)	0 (0.00)	15 (23.08)	65
9.	Jorhat	58 (80.56)	4 (5.56)	0 (0.00)	0 (0.00)	0 (0.00)	10 (13.83)	72
10.	Kamrup	126 (56.76)	16 (7.21)	6 (2.70)	0 (0.00)	0 (0.00)	74 (33.33)	222
11.	Lakhimpur	18 (50.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	18 (50.00)	36
12.	Nagaon	36 (50.00)	0 (0.00)	0 (0.00)	0 (0.00)	16 (22.22)	20 (27.78)	72
13.	Nalbari	128 (60.38)	46 (21.69)	6 (2.83)	0 (0.00)	0 (0.00)	32 (15.09)	212
14.	Sivsagar	24 (70.59)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	10 (29.41)	34
15.	Tinsukia	34 (80.95)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	8 (19.05)	42
Total (%)		1152 (57.86)	236(11.85)	54(2.71)	52(2.61)	16(0.80)	481(24.16)	1991

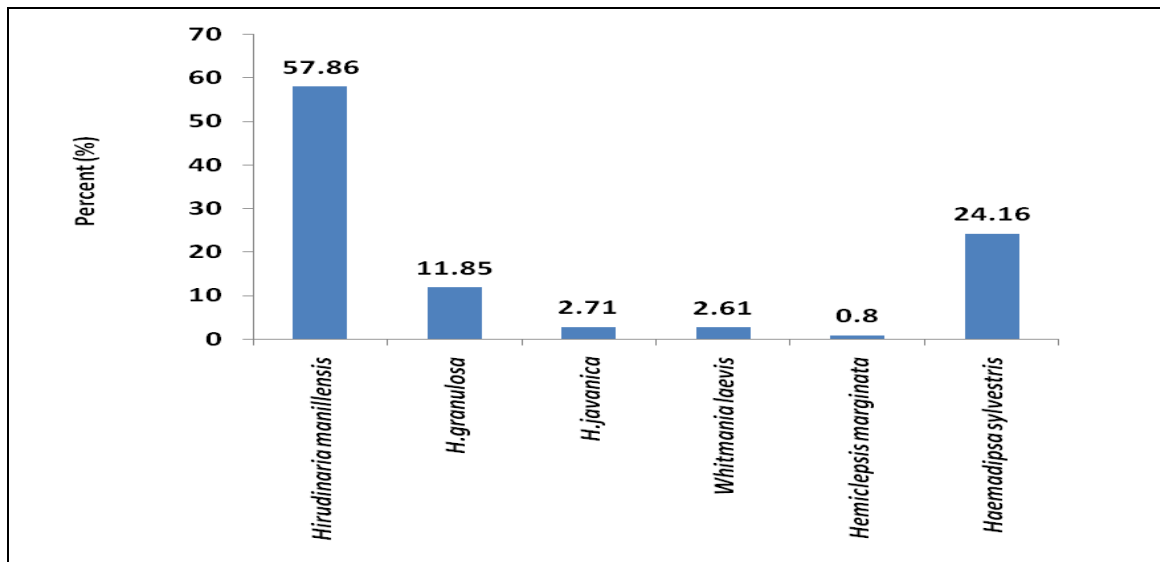


Fig 1: Prevalence of aquatic and terrestrial leeches of Assam



Fig 2: Dorsal surface of *H. manillensis* (Scale: Each smallest div. is equal to 1mm)

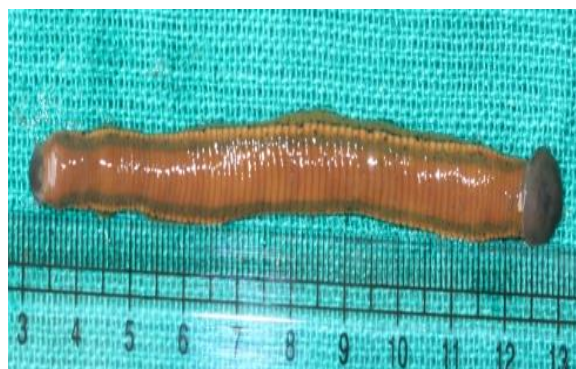


Fig 5: Ventral surface of *H. granulosa* (Scale: Each smallest div. is equal to 1mm)



Fig 3: Latero-ventral view of *H. manillensis*



Fig 6: Dorsal surface of *H. javanica* (Scale: Each smallest div. is equal to 1/10 inch)



Fig 4: Dorsal surface of *H. granulosa* (Scale: Each smallest div. is equal to 1mm)



Fig 7: Latero-ventral view of *H. javanica*



Fig 8: Dorsal surface of *Whitmania laevis* (Scale: Each smallest div. is equal to 1mm)



Fig 9: Ventral surface of *W. laevis* (Scale: Each smallest div. is equal to 1mm)



Fig 10: Ventral view of *Hemiclepsis marginata*



Fig 11: *H. marginata* attached on the wall of an aquarium



Fig 12: Dorsal surface of *Haemadipsa sylvestris*



Fig 13: Latero-ventral surface of *H. sylvestris*

Conclusion

Importance of leech as haematophagous parasite for both man and animal is well known. The findings of the present study will enrich the database regarding different leeches whether aquatic or terrestrial species prevalent in Assam. Since there is a paucity of information regarding the prevalence of leeches present in Assam so the present findings will give an opportunity to go for further detailed studies on the prevalence of other probable leech species.

Acknowledgement

Authors are grateful to the Dean, C.V.Sc., AAU, Khanapara, Guwahati-781 022 for the facilities to carry out this study. Authors are also grateful to Department of Biotechnology, New Delhi for the financial facilities to carry out this study under the DBT Twinning Project "Epidemiology and control of blood feeding leeches of Yak in refugia".

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