



Research Article

Description of Some Indian Veliidae in Different Zoogeographical Regions with special emphasis on *Rhagovelia* and *Microvelia*

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Abstract: The knowledge regarding the Veliidae fauna of India through at the moment is far from complete, but we can profitably venture on an analysis of the zoogeographical composition of the fauna on the basis of present study which should be fairly an accurate index of the general faunal conditions of the area. This is important from a scientific point of view because it opens the door to further studies and new species identification and their relation to zoogeographical climate conditions. The present work summarizes common and important Indian Veliidae, their zoogeographical distribution and concentration towards the Indian States.

Keywords: Indian Veliidae, *Rhagovelia*, *Microvelia*, Endemic species, Oriental species, Cosmopolitan species.

1. Introduction

The Indian region represents an extremely varied topography with high and precipitous mountain peaks, sharp and steep hill slopes having thick and coniferous tropical deciduous forests and an annual rainfall of more than 2000mm.; in contrast to the first levelled low plain with lower amount of rainfall and forest of stunted growth. Veliidae is represented as at present known by 35 species belonging to 9 genera. A reference to the table 1 would clearly show that about 44.4% genera and 57.14% species are endemic. As should be expected a relatively high percentage, about 40% species constitutes the Oriental fauna of Veliidae. In the Northern mountain region of the country which falls under the Palaearctic region, about 8.57% species have so far been recorded. The Ethiopian, Australian, Neotropical and Nearctic realms constitute about fairly similar percentage, i.e. 5.7% of the total fauna. Besides this, about 17.1% species are widespread in different realms.

2. Methodology

The zoogeography of the various genera dealt within the present study, as discussed below which clearly indicates a distinct pattern of distributions. The

study was done in fields with standard methodology and identification keys.

3. Results and Discussion

- (i) ***Rhagovelia* Mayr:** It is the worldwide distributed genus and probably found in all the principal zoogeographical regions and is represented in India by 9 species. The *Rhagovelia* are found on the surface of fresh water, i.e. ponds and lakes.
- (ii) ***Velia* Latreille:** This genus is probably distributed almost entirely in Oriental realm, Nearctic, Neotropical and Palaearctic regions widely distributed throughout in Palaearctic region. The genus is represented in India by one species, i.e. *Velia (Haldwania) sinensis* Andersen. These commonly occur in streams, lakes and stagnant water of ponds.
- (iii) ***Baptista* Distant:** This genus is mainly Oriental, widely distributed in Northern India, including Northern Thailand and Malaysia. In India, this genus is represented by 4 species, of which i.e. *Baptista gestroi* Distant is for the first time recorded during the present study. It is commonly found in lakes.
- (iv) ***Microvelia* Westwood:** Very widely, probably universally distributed genera in which six

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species *Microvelia repentina* Distant, *Microvelia singalensis* Kirkaldy, *Microvelia albomaculata* Distant, *Microvelia* Distant, *Microvelia diluta* Distant and *Microvelia annandalei* are to the knowledge. The genus is represented in India by 8 species.

- (v) **Perittopus Fieber:** This genus is recorded mainly from Oriental region, especially from Java by only two known species, i.e. *Perittopus breddini* Kirkaldy and *Perittopus rufus* Fieber. During the present study, *Perittopus breddini* Kirkaldy is for the first time recorded from India in the present study. They are commonly found in slow and fast flowing streams.
- (vi) **Lathriovelgia Anderson:** It is the first recorded genus from India by a new species *Lathriovelgia pronota* sp. Nov. It was dug out of a watery dark hole in the rock. This one is the habitat sharing species to that of *Baptista* genus. The species of this genus mainly occur in a very cryptic and secluded like wet litter, rocky banks.
- (vii) **Angilovelgia Andersen:** This genus was first recorded from the Oriental region by Anderson. This genus is named to suggest its habitual similarity with species of genus *Angilia*. In this genus is represented in India by only one species.
- (viii) **Angilia Stal:** This genus is well confined in the Oriental region widely distributed in Burma, Celebes, Ceylon, China, Formosa, India, Java, Sumatra. In India, this genus is represented by 2 species. It is commonly found in secondary forest.
- (ix) **Pseudovelgia Hoberlandt:** This genus is throughout represented in the Oriental realm; well distributed in Burma, Ceylon, India, Java, Malaya, Philippines. It is represented by 7 species in India of which four are new species described during the present study. Most species of *Pseudovelgia* inhabit mountain streams and the nearshore zones of rivers. A few species live in the ripple zone along the shores of lakes and water reservoir. From the foregoing account and the given table 1 and 2 showing the range of the distribution of various species of Veliidae occurring in India. It becomes clear that the fauna of this region is a complex admixture of Palaearctic, Ethiopian, Australian, Neotropical, Nearctic and Oriental realms.

Many of the species are endemic to this area while others show a certain definitive distributional pattern which can be classified as follows:-

1. Species which have been able to extend in the rest of the Oriental region.
2. Species which could penetrate into Australian, Palaearctic, Ethiopian, Neotropical and Nearctic regions.

On the basis of the above distributional pattern the known fauna could conveniently be divided under the following heads:-

- (a) **Cosmopolitan species:** The species under this group have a very wide range of distribution occurring in tropical and subtropical parts of the world. Some of the species have been able to establish themselves in all the regions either due to common or by other means of dispersal. The species are *Rhagovelgia nigricans* Burmeister, *Velia currens* Fabr., *Microvelia pulchella* Westwood.
- (b) **Endemic species:** Those species which are confirmed in India are included here. *Rhagovelgia (Rhagovelgia) himachali* sp. Nov., *Rhagovelgia (Rhagovelgia) polhemi* sp. Nov., *Rhagovelgia (Rhagovelgia) miniata* sp. Nov., *Angilia (Adriennella) bidentata* sp. Nov., *Angilia (Adriennella) tridentata* sp. Nov., *Microvelia repentina* Distant, *Microvelia albomaculata* Distant, *Microvelia lundbladi* sp. Nov., *Microvelia femandi* sp. Nov., *Microvelia Miyamoto* sp. Nov., *Microvelia* sp. Nov., *Microvelia* Anderson sp. Nov., *Perittopus campbelli* Lundblad, *Perittopus horvathi* Lundblad, *Perittopus maculatus* Paiva, *Baptista fingeri* sp. Nov., *Baptista sushmae* sp. Nov., *Baptista tridigita* sp. Nov., *Lathriovelgia pronota* sp. Nov., *Pseudovelgia bajjali* sp. Nov., *Pseudovelgia hungerfordi* sp. Nov., *Pseudovelgia lingual* sp. Nov., *Pseudovelgia matsuda* sp. Nov.
- (c) **Oriental species:** The Indian species occurring in other parts of the Oriental region (Burma, Ceylon, Nepal, Java, Sumatra, Bali, Borneo, Thailand, South China, Celebes, Philippines, and Formosa) are placed under this group. *Rhagovelgia (Rhagovelgia) nigricans* (Burmeister), *Rhagovelgia (Rhagovelgia) lundbladi* Hungerford & Matsuda, *Rhagovelgia (Rhagovelgia) cotabatoensis* Hungerford & Matsuda, *Rhagovelgia (Rhagovelgia) hoberlandti* Hungerford & Matsuda, *Rhagovelgia (Rhagovelgia) usingeri* Hungerford & Matsuda, *Rhagovelgia (Rhagovelgia) mindanaoensis* Hungerford & Matsuda, *Rhagovelgia (Neorthagovelgia) hoogstraali* Hungerford & Matsuda, *Velia (Haldwania) sinensis* Anderson, *Angilovelgia y-alba* (Paiva), *Microvelia annandalei* Distant, *Microvelia douglasi* Scott, *Perittopus breddini* Kirkaldy, *Baptista gestroi* Distant, *Lathriovelgia capitata* Anderson, *Pseudovelgia tibialis* Esaki & Miyamoto, *Pseudovelgia (Pseudovelgia) sexualis* (Paiva), *Pseudovelgia (Pseudovelgia) feuerbomi* Anderson.
- (d) **Indo Palaearctic species:** The species occurring in Indian, as well as palaearctic regions, are placed under this group. The species are *Rhagovelgia (Rhagovelgia) nigricans* Burm., *Velia currens* Febr., *Microvelia douglasi* Scott., *Perittopus breddini* Kirkaldy, *Angilovelgia y-alba* (Paiva).

Table 1. Distribution of species of Veliidae occurring in India.

S. No.	Name of the species	Occurring in India	Occurring in other parts of oriental realm	Occurring in Palaearctic realm	Occurring in Ethiopian region	Occurring in Australian region	Occurring in Neotropical region	Occurring in Nearctic region
1.	<i>Rhagovelia (s.str.) himachali</i> sp.nov.	+	-	-	?	?	?	?
2.	<i>Rhagovelia (s.str.) miniata</i> sp.nov.	+	+	-	-	-	-	-
3.	<i>Rhagovelia (s.str.) lundbladi</i> Hungerford & Matsuda	+	-	-	-	-	-	-
4.	<i>Rhagovelia (s.str.) polhemi</i> sp.nov.	+	+	-	?	?	?	?
5.	<i>Rhagovelia (s.str.) cotabatoensis</i> Hungerford & Matsuda	+	+	-	-	-	-	-
6.	<i>Rhagovelia (s.str.) hoberlandti</i> Hungerford & Matsuda	+	+	-	-	-	-	-
7.	<i>Rhagovelia (s.str.) usingeri</i> Hungerford & Matsuda	+	+	-	?	?	?	?
8.	<i>Rhagovelia (s.str.) mindanaoensis</i> Hungerford & Matsuda	+	+	-	-	-	-	-
9.	<i>Rhagovelia (Neorhagovelia) hoogstraali</i> Hungerford & Matsuda	+	+	-	-	-	-	-
10.	<i>Valia (Haldwania) sinensis</i> Anderson	+	+	-	-	-	-	-

Table 2. Range of distribution of Indian Veliidae.

S. No.	Name of the species	Range
1.	<i>Rhagovelia (s.str.) himachali</i> sp.nov.	India
2.	<i>Rhagovelia (s.str.) miniata</i> sp.nov.	India
3.	<i>Rhagovelia (s.str.) lundbladi</i> Hungerford & Matsuda	India
4.	<i>Rhagovelia (s.str.) polhemi</i> sp.nov.	India
5.	<i>Rhagovelia (s.str.) cotabatoensis</i> Hungerford & Matsuda	India
6.	<i>Rhagovelia (s.str.) hoberlandti</i> Hungerford & Matsuda	India, Europe, and America
7.	<i>Rhagovelia (s.str.) usingeri</i> Hungerford & Matsuda	India
8.	<i>Rhagovelia (s.str.) mindanaoensis</i> Hungerford & Matsuda	India
9.	<i>Rhagovelia (Neorhagovelia) hoogstraali</i> Hungerford & Matsuda	India
10.	<i>Valia (Haldwania) sinensis</i> Anderson	India
11.	<i>Angilia (Adriennella) bidentata</i> sp.nov.	India
12.	<i>Angilia (Adriennella) tridentata</i> sp.nov.	India
13.	<i>Angilovelvia y-alba</i> (Paiva)	India, Burma, Malaysia
14.	<i>Microvelia aashishi</i> sp.nov.	India
15.	<i>Microvelia femandi</i> sp.nov.	India
16.	<i>Microvelia miyamoto</i> sp.nov.	India and Europe
17.	<i>Microvelia andersoni</i> sp.nov.	India, Sri Lanka
18.	<i>Microvelia diluta</i> Distant	India, Sri Lanka, Sumatra, Queensland, Singapore
19.	<i>Microvelia annandalei</i> Distant	India
20.	<i>Microvelia (s.str.) douglasi</i> Scott.	India
21.	<i>Microvelia (s.str.) lundbladi</i> sp.nov.	India, Ceylon, Burma, Malaya, Philippines, Sumatra, Java
22.	<i>Perittopus breddini</i> Kirkaldy	India
23.	<i>Baptista gestroi</i> Distant	India, Burma, Thailand
24.	<i>Baptista fingeri</i> sp.nov.	India
25.	<i>Baptista sushmae</i> sp.nov.	India
26.	<i>Baptista tridigita</i> sp.nov.	India
27.	<i>Lathriovelvia capitata</i> Anderson	India, Malaysia
28.	<i>Lathriovelvia pronota</i> sp.nov.	India
29.	<i>Pseudovelvia (s.str.) bajjali</i> sp.nov.	India
30.	<i>Pseudovelvia (s.str.) hungerfordi</i> sp.nov.	India
31.	<i>Pseudovelvia (s.str.) sexualis</i> (Paiva)	India
32.	<i>Pseudovelvia (s.str.) lingual</i> sp.nov.	India
33.	<i>Pseudovelvia (s.str.) feuerbomi</i> Anderson	India, Java, Thailand, Malaysia
34.	<i>Pseudovelvia (s.str.) matsudi</i> sp.nov.	India
35.	<i>Pseudovelvia (s.str.) longitarsa</i> sp.nov.	India and China

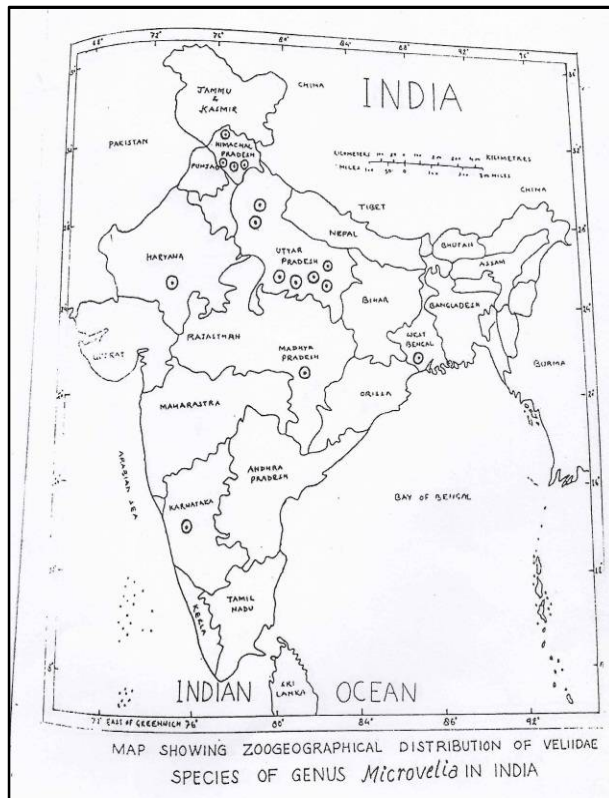
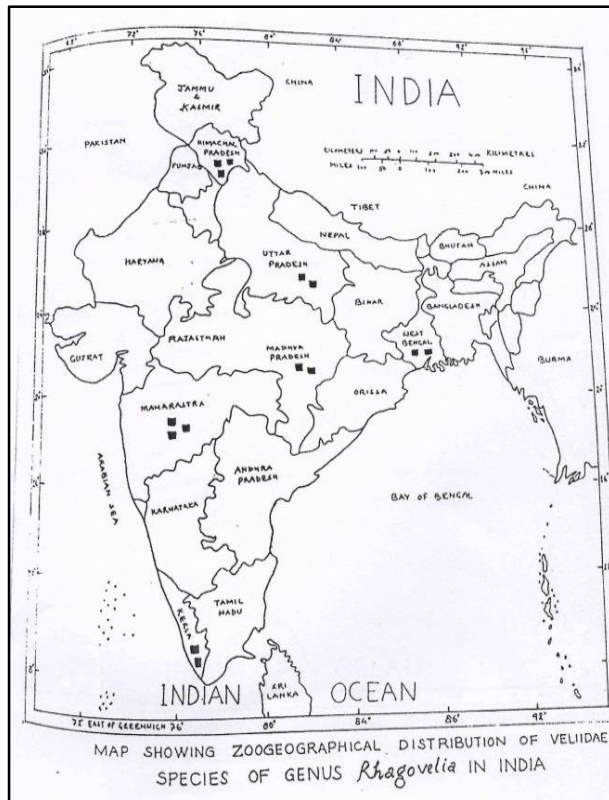
(e) **Indo-Ethiopian species:** The species recorded from Indian as well as Ethiopian region are Placed in this group. The species are *Microvelia douglasi* Scott., *Perittopus breddini* Kirkaldy, *Pseudovelvia tibialis* Esaki & Miyamoto, *Microvelia pulchella* Kirkaldy.

(f) **Indo-Australian species:** The species recorded from Indian as well as Australian region is placed in this group. The species are *Rhagovelia (s.str.)*

lundbladi Hungerford & Matsuda, *Rhagovelia (s.str.) insignis* Distant, *Rhagovelia (s.str.) nigricans* Burm., *Perittopus breddini* Kirkaldy, *Valia currens* Fabr.

(g) **Indo Nearctic and Neotropical species:** The species recorded from Indian as well as Nearctic and Neotropical region are placed in this group. The species are *Rhagovelia (s.str.) nigricans*

Burm., *Perittopus breddini* Kirkaldy, *Microvelia douglasi* Scott.



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