

**CHAPTER - 3**  
**TAXONOMIC KEY**

# CHAPTER 3

## TAXONOMIC KEY

### 3.1 Introduction

A taxonomic tool or device that used to identify each specimen in a group of specimens, called as “Key”. This can be achieved by presenting the diagnostic characters in a sequence of opposing features. The key helps in a rapid identification of unknown specimen and this can be attained by always a choice between two contradictory statements provided in the key, in which one statement can be accepted and the other one can be rejected. The key should be constructed by the use of constant characters, not variables. There are no specialized tools such as taxonomic key presently available for the identification of water bugs from this region. Thus, this research study provided the taxonomic key of recorded 65 species of this group from the selected aquatic habitats of Kerala.

#### Key to the infraorders of water bugs

1. Antennae short and located beneath the eyes and not clearly visible from above; fully aquatic in nature..... Nepomorpha  
  
Antennae long and located in front of eyes and clearly visible from above; semi-aquatic in nature..... 2
2. Living on the water surface; body size small to large; wings without prominent spots..... Gerromorpha  
  
Living on the shorelines; body size not large; wings with prominent yellow spots..... Leptopodomorpha

## Key to the families of Infraorder Nepomorpha

1. Ocelli present..... 2  
    Ocelli absent..... 3
2. Short rostrum and triangular shaped and not clearly segmented; fore tarsi modified into scoop-like structure and single segmented with bristles..... 4  
    Long rostrum and cone shaped and clearly segmented; fore tarsi not modified into scoop-like structure and single or more segmented without bristles..... 5
3. Body length 2 mm or more; scutellum concealed and covered by pronotum..... Corixidae  
    Body length less than 2 mm; scutellum exposed..... Micronectidae
4. Body slender and long; abdomen with a pair of respiratory tube basally with spiracles..... Nepidae  
    Body not slender and long; abdomen without a pair of respiratory tube, but abdominal spiracles very short or absent..... 6
5. Breathing tube short and retractile; wing membranes with prominent veins..... Belostomatidae  
    Breathing tube absent; wing membranes without prominent veins..... 7
6. Abdomen with spiracles; forelegs raptorial..... Naucoridae  
    Abdomen without spiracles; forelegs not raptorial..... Notonectidae
7. Head and pronotum attached; antennae one or two segmented..... Helotrephidae  
    Head and pronotum not attached; antennae three or four segmented..... Pleidae

### **Key to the genus of Family Nepidae**

1. Sub-cylindrical and elongated body; pronotum longer than wide..... 2  
  
Dorso-ventrally flattened body; pronotum wider than long..... *Laccotrephes*
2. Respiratory tube usually long and slender and not one fourth of the body length;  
laterally eyes globular and not reflected downwards..... *Ranatra*  
  
Respiratory tube very short and one fourth of the body length; laterally eyes not  
globular and reflected downwards..... *Cercotmetus*

### **Key to the species of Genus *Laccotrephes***

1. Respiratory siphon longer than body length; abdominal appendages slightly longer  
than body length..... *Laccotrephes ruber* Linnaeus, 1764  
  
Respiratory siphon shorter than body length; abdominal appendages distinctly  
shorter than body length..... *Laccotrephes griseus* Stal, 1866

### **Key to the species of Genus *Ranatra***

1. Body small and ranges from 20 mm to 30 mm in length; respiratory siphon usually  
long and slender..... 2  
  
Body large and ranges from 40 mm to 45 mm in length; respiratory siphon two  
times longer than the body length..... *Ranatra elongata* Fabricius, 1790
2. Vertex rounded; mid and hind tibia ventrally with long stout hairs..... 3  
  
Vertex slightly elevated; mid and hind tibia ventrally with fine  
hairs..... *Ranatra filiformis* Fabricius, 1790
3. Mesosternum rounded with a cleft; second and third antennal segments with  
numerous short spines..... *Ranatra varipes varipes* Stal, 1861

Mesosternum broadly depressed with a keel; second and third antennal segments with few short spines..... *Ranatra varipes atropa* Montandon, 1903

### **Key to the genus of Family Belostomatidae**

1. Relatively small or ovate bugs; body length less than 20 mm..... *Diplonychus*

Larger bugs; body length more than 60 mm and up to 90 mm..... *Lethocerus*

### **Key to the species of Genus *Diplonychus***

1. Posterior pronotal angle more obtuse; respiratory tube without group of hairs..... *Diplonychus molestus* Dufour, 1863

Posterior pronotal angle less acute; respiratory tube with group of hairs..... *Diplonychus rusticus* Fabricius, 1781

### **Key to the species of Family Corixidae**

1. Pronotum with six transverse yellow stripes; corium with fragmented yellow lines..... *Sigara (Tropocorixa) promontoria* Distant, 1910

Pronotum with ten transverse yellow stripes; corium with transverse yellow lines..... *Sigara (Vermicorixa) kempi* Hutchinson, 1940

### **Key to the species of Family Micronectidae**

1. Small to medium sized species and body length less than 4 mm..... 2

Large and elongate species and body length more than 4 mm..... *Micronecta scutellaris scutellaris* Stal, 1858

2. Hemelytra yellowish and speckled with prominent dark patches..... *Micronecta haliploides* Horvath, 1904

- Hemelytra not yellowish and speckled with prominent unbroken or broken stripes..... 3
3. Pronotum without stripes; wings with irregular linear bands..... 4
- Pronotum with a pair of darker stripes; wings with four regular parallel bands..... *Micronecta ludibunda* Breddin, 1905
4. Medium sized body; lateral margins of hemelytra with four dark patches..... *Micronecta quadristrigata* Breddin, 1905
- Small sized body; lateral margins of hemelytra not as above..... 5
5. Head pale yellow-coloured with pale orange stripe on frons; two uncleared orange spots near the inner edge of the eyes..... *Micronecta khasiensis* Hutchinson, 1940
- Head light yellow-coloured with an unclear elongate orange spot on frons; a pair of orange spots as cloud nears the eyes..... *Micronecta desertana desertana* Distant, 1920

### **Key to the genus of Family Notonectidae**

1. Three segmented antennae; eyes may or may not be holoptic..... 2
- Four-segmented antennae; eyes not holoptic..... *Enithares*
2. Hemelytral commissure from the anterior end with a hair lined pit..... *Anisops*
- Hemelytral commissure from the anterior end continuous..... *Nychia*

### **Key to the species of Genus *Anisops***

1. Interocular space anteriorly produced into cephalic horn or projection..... 2
- Interocular space anteriorly not produced into cephalic horn or projection..... 4

2. Frons formed into a cephalic projection with broadly indented apex and larger..... *Anisops nasutus* Fieber, 1851
- Frons formed into a cephalic horn or beak-like structure with more or less acute apex..... 3
3. Cephalic horn less acuminate and may be one fifth of its ventral length and reaching beyond the anterior margin of eyes..... *Anisops bouvieri* Kirkaldy, 1904
- Cephalic horn more acuminate and excavates of its entire length and bordered by two carinae laterally..... *Anisops sardeus sardeus* Herrich-Shaffer, 1850
4. Scutellum with three dark longitudinal spots..... *Anisops tahitiensis* Lundblad, 1934
- Scutellum without any spots..... 5
5. Synthlipsis thin and less than one third the width of the vertex anteriorly..... 6
- Synthlipsis extensive and more than one third the width of the vertex anteriorly..... *Anisops paranigrolineatus* Brooks, 1951
6. Dorsally holoptic eyes in posterior half..... *Anisops breddini* Kirkaldy, 1901
- Dorsally not holoptic eyes in posterior half..... 7
7. Tylus medially excavates..... *Anisops niveus* Fabricius, 1775
- Tylus flat or swollen, not medially excavates..... 8
8. Body length up to 9 mm; tylus swollen, with a pair of clusters of bristles extending the base of the labrum..... *Anisops barbatus* Brooks, 1951
- Body length up to 8 mm; tylus flat or slightly swollen, without clusters of bristles..... *Anisops occipitalis* Breddin, 1905

## Key to the species of Family Pleidae

1. Head with only a median reddish brown longitudinal stripe anteriorly; pronotum with large well-defined five reddish brown humeral spots..... *Paraplea liturata* Fieber, 1844  
  
Head with a median reddish brown longitudinal stripe anteriorly and two indistinct spots basally; pronotum without reddish brown spots..... *Paraplea frontalis* Fieber, 1844

## Key to the families of Infraorder Gerromorpha

1. Claws of fore tarsus pre-apical..... 2  
  
Claws of fore tarsus apical..... 3
2. Body size varies from 2 mm to 40 mm; hind femora longer than abdomen; mesothorax longer than the other thoracic segments..... Gerridae  
  
Body size varies from 1.8 mm to 18 mm; hind femora shorter than abdomen; mesothorax shorter than the other thoracic segments..... Vellidae
3. Body elongated and stick like; metasternal scent gland opening absent..... Hydrometridae  
  
Body small and not as above; metasternal scent gland opening present..... 4
4. Ventrally head grooved; tarsi with two segments; hind legs without spines..... Hebridae  
  
Ventrally head not grooved; tarsi with three segments; hind legs with prominent spines..... Mesovellidae



## Key to the genus of Family Gerridae

1. Long and thin body..... 2  
Elongate or oval body..... 11
2. Fore femur with two separate hair clumps..... *Amemboa*  
Fore femur without hair clumps..... 3
3. First abdominal segment ventrally retained; fore femur very longer than tibia..... *Rhagadotarsus*  
First abdominal segment ventrally absent; fore femur slightly longer than tibia..... 4
4. Dorsally head homogenously dark with some patterns..... 5  
Dorsally head not homogenously dark with light stripes or spots..... *Aquarius*
5. Pronotum with a pair of longitudinal spots or lines anteriorly.....6  
Pronotum with a large median spot anteriorly..... 9
6. First abdominal tergite with straight anterior margin..... 7  
First abdominal tergite without straight anterior margin..... *Cylindrostethus*
7. Seventh abdominal tergite produced into a spine-like structure..... *Limnometra*  
Seventh abdominal tergite not as above, but the connexivum ending into a spine-like structure..... *Limnogonus*
8. Hind femur very longer than mid femur; mid femur ventrally fringed with hairs..... *Ptilomera*

- Hind femur shorter than mid femur; mid femur ventrally fringed without any hairs..... *Pleciobates*
9. Pronotum with three black stripes, median stripes straight and the lateral stripes slightly curved; third antennal segments longer..... *Lathriobates*
- Pronotum without any stripes; first antennal segments longer..... 10
10. Body elongated; head with U-shaped yellow marking..... *Neogerris*
- Body not elongated, but dorsoventrally flattened; head with large elongated dark brown marking..... *Naboandelus*
11. Mid femur thick and without any spines..... *Metrocoris*
- Mid femur narrow and apically fringed with thin spines..... *Ventidius*

### **Key to the species of Genus *Limnogonus***

1. Pronotal lobe usually with a median stripe and two small yellow spots present anteriorly..... *Limnogonus (Limnogonus) fossarum fossarum* Fabricius, 1775
- Pronotal lobe without a median yellow stripe but two small yellow spots present anteriorly..... *Limnogonus (Limnogonus) nitidus* Mayr, 1865

### **Key to the species of Genus *Limnometra***

1. Mesocoxa of mid leg with a spine on lateral margins..... *Limnometra fluviorum* Fabricius, 1798
- Mesocoxa of mid leg without a spine on lateral margins..... *Limnometra anadyomene* Kirkaldy, 1901

### Key to the species of Genus *Ptilomera*

1. Metacoxa with prominent spine at rear margin... *Ptilomera (Ptilomera) laticaudata* Hardwicke, 1823  
Metacoxa without spine at rear margin..... 2
2. Pygophore projection extending the lateral side of subgenital plate..... *Ptilomera (Ptilomera) agroides* Schmidt, 1926  
Pygophore projection short and truncated on the apex of the sub-genital plate..... *Ptilomera (Ptilomera) assamensis* Hungerford & Matsuda, 1965

### Key to the species of Genus *Pleciobates*

1. Rostrum stout, dark brown coloured and extending up to the prosternum; antennae longer than body..... *Pleciobates indicus* Thirumalai, 1986  
Rostrum stout, brown coloured and not extending up to the prosternum; antennae shorter than body..... *Pleciobates nostras* Thirumalai, 1986

### Key to the species of Genus *Metrocoris*

1. Body 4.9 mm in length; second antennal segment slightly shorter than third antennal segment..... *Metrocoris darjeelingensis* Basu, Polhemus & Subramanian, 2016  
Body 5.2 mm in length; second antennal segment slightly longer than second antennal segment..... *Metrocoris communoides* Chen & Nieser, 1993

### Key to the genus of Family Veliidae

1. Protibia with grasping comb..... 2  
Protibia without grasping comb..... *Neoalardus*

2. Mid tarsi intensely forked and basally with plumose swimming fan..... *Rhagovelia*  
     Mid tarsi not intensely forked and without any plumose swimming fan..... 3
3. Antennae short; antennal segments shorter than body length..... *Microvelia*  
     Antennae long; antennal segments longer than body length..... *Thirumalaia*

### **Key to the species of Genus *Microvelia***

1. Pronotum dark black and crescent shaped..... *Microvelia (Dilutovelia) leveillei*  
     *leveillei* Lethierry, 1877  
     Pronotum dark black or brown and concave shaped..... 2
2. Pronotum with two transverse yellow markings, not extending beyond the apex of  
     pronotum..... *Microvelia (Microvelia) douglasi* Scott, 1874  
     Pronotum with a small reddish brown marginal fascia..... 3
3. Hemelytra transparent and dull white coloured with dark brownish  
     veins..... *Microvelia (Microvelia) diluta* Distant, 1909  
     Hemelytra largely spotted with greyish white, clavus with a long spot, corium with  
     five spots..... *Microvelia (Microvelia) albomaculata* Distant, 1909

### **Key to the species of Family Mesoveliidae**

1. Posterior margin of middle femora fringed with numerous black spines; last  
     abdominal segment with single median spine..... *Mesovelia vittigera*  
     Horvath, 1895  
     Posterior margin of middle femora fringed with only one or two black spines; last  
     abdominal segment with group of median spines..... *Mesovelia horvathi*  
     Lundblad, 1934

## Key to the species of Family Hydrometridae

1. Seventh sternite transversely depressed and hairy; wings with alternative white stripes..... *Hydrometra greeni* Kirkaldy, 1898  
  
Seventh sternite straight and hairy; wings without alternative white stripes but, with brown alternative patches..... *Hydrometra butleri* Hungerford & Evans, 1934