Pictorial Handbook on

Common Dragonflies and Damselflies of Kerala

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Zoological Survey of India

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PREFACE

Dragonflies (Odonata : Insecta) are one among the most fascinating and elegant groups of insects usually found near water bodies. However, many of them can be seen in our gardens, even in urban areas, a few even reaching our homes in the late evenings attracted to the light or following prey insects that get attracted to the light. Economically, odonates are most significant because they are predators of mosquitoes and other insects including agricultural pests and vectors of diseases that cause serious agricultural loss and health problems to human beings. Besides, the odonate nymphs are biological indicators of aquatic pollution. Clearing up of forested areas, filling up of lowlands, particularly of water bodies in the name of development and polluting the water bodies lead to the elimination of these beautiful insects.

This book is aimed at interested amateurs, primarily the younger people, as well as those interested to learn more about the dragonflies of Kerala.With the help of the photographs provided, it may not be difficult to identify all the 46 species dealt with in the book because, in many cases broad characters such as the colour of the body and characters on the wings would be sufficient. However, for a more serious study, it is necessary to familiarise oneself with the general taxonomic characters of the group and their species-specific variations. To facilitate these, a series of illustrations revealing the various basic characters and their explanations are provided and further, the taxonomic variations exhibited by each species, provided as diagnosis under the respective species accounts.

We are extremely grateful to Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata whose insightful idea of publishing popular series of handbooks and scientific documents on fauna of the country, spurred our inspiration for presenting this work. His constant encouragements and generous support including the facilities extended are gratefully acknowledged. We are also indebted to Sri. Babu Kambrath, photographer and naturalist, Malabar Natural History Society, Kozhikode, Kerala, for providing us with the photographs presented in this book.

AUTHORS

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INTRODUCTION

Odonates (Odonata : Insecta) have inhabited the world for about 245 million years along with Cockroaches and Mayflies. They are believed to be the descendants of the Protodonata that existed 300+ million years back. Among the Protodonates were members of the family Meganeuridae that included giant forms, which had a wingspan of 60 cm. to 1 meter, making them the largest hexapods ever to have existed. Fossil evidences indicate that dragonflies closely related to the modern ones have appeared in the Mesozoic Era.

Basically, the odonates are divided into two groups; the robust built ones that are also strong fliers the dragonflies and the thin bodied, weak fliers the damselflies. They are predators both in their adult and nymphal stages. They exhibit incomplete metamorphosis. Adult Odonates are terrestrial (aerial) and generally found near water bodies like ponds, lakes, streams, tanks and marshes, whereas their eggs and young ones are aquatic completing the life cycle in water.

Some species of odonates, especially *Pantala flavescens*, are migratory in behaviour and can fly several hundred kilometers over land and sea. In many species, the mature males exhibit territorial behaviour establishing themselves along the stretches of water, which they defend from other males. The general life expectancy of species in the tropics may last a full year in the adult stage, and a few months in the larval stage.

The Odonates are distributed in all geographical realms, but their greatest numbers and diversity occur in the tropics. About 7000 species of Odonata belonging to 630 genera and 28 families are reported from the world over. Taxonomically, the order Odonata is divided into 3 suborders, the Anisoptera (Dragonflies), the Zygoptera (Damselflies) and the Anisozygoptera. The Zygoptera and the Anisoptera are well-established groups and are represented in Kerala. The Anisozygoptera an intermediate group is represented in India only by one species, *Epiophlebia laidlawi* Tillyard, found in Darjeeling (West Bengal).

The works of Fraser (1924, 1932, 1933, 1934 & 1936), Prasad & Varshney (1995), Peters (1981), Rao & Lahiri (1982), Mathavan & Miller (1989), Radhakrishnan (1997), Emiliyamma & Radhakrishnan (2000 & 2002), Jafer *et al.* (2002), Mitra (2003) and Radhakrishnan & Emiliyamma (2003) provide us information on the odonates of Kerala. There are 500 species and subspecies under 140 genera and 17 families occurring in India and of these, 137 species and subspecies (28 % of the species recorded from India) spread over 79 genera and 12 families are met with in Kerala (Table–1 and Appendix–1).

46 species of dragonflies and damselflies found very commonly in Kerala are dealt with in this book. A study of the basic figures (fig. 3–7), including the systematic accounts, coupled with the photographs provided in this book, is hoped to make the reader ready for studying the odonates.

Table 1. Diversity of Odonata (Insecta) in India/Kerala

Sl. No.	Genera in India	Number of species in India	Number of species in Kerala
1.	*Archibasis* Kirby	1	1
2.	*Ceriagrion* Selys	8	4
3.	*Pseudagrion* Selys	11	5
4.	*Cercion* Navas	2	1
5.	*Coenagrion* Kirby	1	
6.	*Himalagrion* Fraser	2	
7.	*Aciagrion* Selys	8	2
8.	*Pyrrhosoma* Charpentier	1	
9.	*Enallagama* Charpentier	5	
10.	*Ischnura* Charpentier	11	2
11.	*Rhodischnura* Laidlaw	1	
12.	*Agriocnemis* Selys	9	4
13.	*Argiocnemis* Selys	1	
14.	*Mortonagrion* Fraser	2	1
15.	*Onychargia* Selys	2	1
16.	*Calicnemis* Strand	10	
17.	*Coeliccia* Kirby	12	
18.	*Indocnemis* Laidlaw	1	
19.	*Copera* Kirby	6	2
20.	*Platycnemis* Charpentier	1	
21.	*Drepanosticta* Laidlaw	3	
22.	*Platysticta* Selys	1	1
23.	*Protosticta* Selys	9	6
24.	*Caconeura* Kirby	5	2
25.	*Esme* Fraser	3	2
26.	*Melanoneura* Fraser	1	1
27.	*Phylloneura* Fraser	1	1
28.	*Disparoneura* Fraser	3	

Sl. No.	Genera in India	Number of species in India	Number of species in Kerala
29.	*Elattoneura* Cowley	7	2
30.	*Prodasineura* Cowley	4	1
31.	*Lestes* Leach	16	3
32.	*Orolestes* MacLachlan	2	
33.	*Indolestes* Fraser	6	1
34.	*Sympecma* Burmeister	2	
35.	*Burmargiolestes* Kennedy	1	
36.	*Megalestes* Selys	6	
37.	*Philoganga* Kirby	1	
38.	*Caliphaea* Selys	1	
39.	*Echo* Selys	2	
40.	*Matrona* Selys	1	
41.	*Neurobasis* Selys	1	1
42.	*Vestalis* Selys	5	3
43.	*Rhinocypha* Rambur	14	1
44.	*Indocypha* Laidlaw	1	
45.	*Calocypha* Fraser	1	1
46.	*Libellago* Selys	4	1
47.	*Anisopleura* Selys	5	
48.	*Bayadera* Selys	4	
49.	*Dysphaea* Selys	2	1
50.	*Epallage* Charpentier	1	
51.	*Euphaea* Selys	6	3
52.	*Schmidtiphaea* Asahina	1	
53.	*Epiophlebia* Calvert	1	
54.	*Anisogomphus* Selys	4	
55.	*Anormogomphus* Selys	2	
56.	*Asiagomphus* Asahina	3	
57.	*Burmagomphus* Williamson	6	1
58.	*Cyclogomphus* Selys	4	
59.	*Dubitogomphus* Fraser	1	
60.	*Heliogomphus* Laidlaw	4	1
61.	*Macrogomphus* Selys	5	1
62.	*Merogomphus* Martin	3	2
63.	*Microgomphus* Selys	4	1
64.	*Phaenandrogomphus* Lieftinck	1	
65.	*Platygomphus* Selys	1	
66.	*Davidius* Selys	7	
67.	*Nepogomphus* Fraser	1	
68.	*Nihonogomphus* Oguma	1	
69.	*Stylogomphus* Fraser	1	

Sl. No.	Genera in India	Number of species in India	Number of species in Kerala
70.	*Acrogomphus* Laidlaw	2	1
71.	*Davidioides* Fraser	1	1
72.	*Megalogomphus* Campioni	5	2
73.	*Onychogomphus* Selys	16	3
74.	*Ophiogomphus* Selys	2	
75.	*Paragomphus* Cowley	3	1
76.	*Perissogomphus* Laidlaw	1	
77.	*Gomphidia* Selys	6	1
78.	*Ictinogomphus* Cowley	6	1
79.	*Aeshna* Fabricius	4	
80.	*Anaciaeschna* Selys	3	1
81.	*Anax* Leach	6	2
82.	*Hemianax* Selys	1	1
83.	*Gynacantha* Rambur	10	1
84.	*Tetracanthagyna* Selys	1	
85.	*Austroaeschna* Selys	1	
86.	*Cephalaeschna* Selys	5	
87.	*Gynacanthaeschna* Fraser	1	
88.	*Oligoaeschna* Selys	3	
89.	*Periaeschna* Martin	4	
90.	*Petaliaeschna* Fraser	1	
91.	*Polycanthagyna* Fraser	2	
92.	*Chlorogomphus* Selys	11	2
93.	*Anotogaster* Selys	3	
94.	*Cordulegaster* Leach	3	
95.	*Neallogaster* Cowley	5	
96.	*Hemicordulia* Selys	1	1
97.	*Somatochlora* Selys	1	
98.	*Idionyx* Hagen	14	5
99.	*Macromidia* Martin	1	1
100.	*Epophthalmia* Burmeister	4	2
101.	*Macromia* Rambur	14	4
102.	*Hylaeothemis* Ris	2	1
103.	*Tetrathemis* Brauer	1	1
104.	*Brachydiplax* Brauer	3	2
105.	*Nannophya* Rambur	2	
106.	*Agrionoptera* Brauer	2	
107.	*Amphithemis* Selys	2	
108.	*Cratilla* Kirby	1	1
109.	*Epithemis* Laidlaw	1	1

Sl. No.	Genera in India	Number of species in India	Number of species in Kerala
110.	*Lathrecista* Kirby	1	1
111.	*Libellula* Linnaeus	1	
112.	*Nesoxenia* Kirby	1	
113.	*Lyriothemis* Brauer	3	
114.	*Orthetrum* Newman	15	7
115.	*Potamarcha* Karsch	1	1
116.	*Acisoma* Rambur	1	1
117.	*Brachythemis* Brauer	1	1
118.	*Bradinopyga* Kirby	2	1
119.	*Crocothemis* Brauer	3	1
120.	*Diplacodes* Kirby	3	2
121.	*Indothemis* Ris	2	1
122.	*Neurothemis* Brauer	6	4
123.	*Rhodothemis* Ris	1	1
124.	*Sympetrum* Newman	9	1
125.	*Trithemis* Brauer	4	4
126.	*Onychothemis* Brauer	1	1
127.	*Palpopleura* Rambur	2	1
128.	*Rhyothemis* Hagen	4	2
129.	*Camacinia* Kirby	1	
130.	*Hydrobasileus* Kirby	1	1
131.	*Pantala* Hagen	1	1
132.	*Pseudotramea* Fraser	1	
133.	*Tramea* Hagen	4	2
134.	*Tholymis* Hagen	1	1
135.	*Zyxomma* Rambur	1	1
136.	*Aethriamanta* Kirby	1	1
137.	*Macrodiplax* Brauer	1	1
138.	*Selysiothemis* Ris	1	
139.	*Urothemis* Brauer	1	1
140.	*Zygonyx* Hagen	6	2
	Total	**500**	**137**

BIOLOGY

Usually, copulation takes place during flight. The male curls its abdomen downwards to transfer the sperms from the genital pore to the accessory genitalia present on the ventral side of abdominal segments 2 and 3. During this process, the male zygopteran clasps the front of the female prothorax, while the male anisopteran clasps the female head. The pair then flies together in a 'tandem position' (Fig. 1). In the next stage, the female bends its abdomen round and forwards to bring its genitalia in contact with male genitalia, thus forming 'the wheel position' (Fig. 2). The copulation may last from a few seconds to many hours. Oviposition occurs soon after copulation. In most cases, the male remains associated with the female in tandem position while ovipositing. This behaviour ensures that the eggs laid are fertilised by the guarding male.

The number of eggs laid by an ovipositing female varies from a few hundreds to several thousands, laid usually in batches in rows, or in a zigzag pattern or scattered at random. Eggs of endophytic species are elongate, and it is the characteristic of the Zygoptera and a few anisopteran families. In this method, the eggs are inserted into slits made by the ovipositor in the stems and leaves of plants or other objects near or

Fig. 1. Tandem position of Damselflies

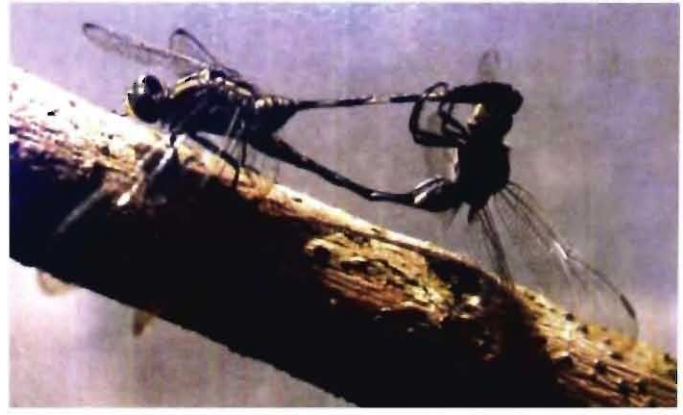


Fig. 2. Wheel position of mating Dragonflies

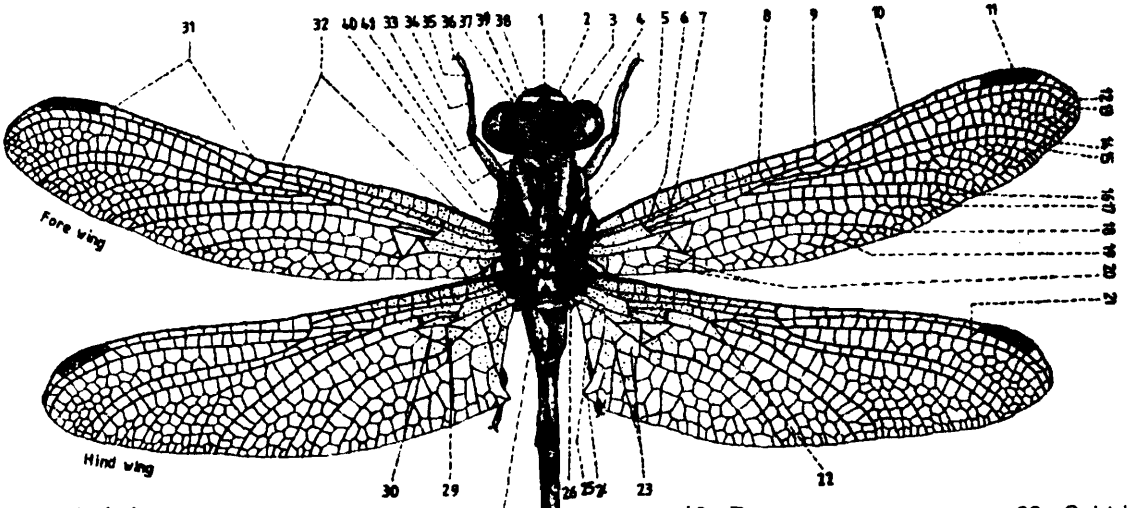
under the water. In some cases, the female alone or with male descends below the water surface for egg laying. In exophytic species, the eggs are broad and elliptical, either dropped into the water or attached superficially to aquatic plants or laid in gelatinous strings attached to submerged twigs. This method is characteristic of the Anisoptera.

The eggs hatch out into nymphs after a variable period, from a few days to several months depending on the species and the atmospheric temperature. For the first few days, the newly hatched nymph or pronymph, live on the yolk retained in their bodies. There are several larval instars (the number varying usually, 9 to 12 or 16 – from species to species according to temperature and food), before the final instar that leads to the emergence of the imago. The body of the nymph is divided into three parts as in the adult. The nymphs of Zygoptera are slim and elongate, provided with three terminal caudal gills or lamellae, the two lateral ones called, paraprocts and the median one, the epiproct. The anisopteran larva is much stout and flattened. They are bottom living, concealed under mud and have their bodies covered with hairs. They can change their colour according to the surroundings in which they live. Their food includes Protozoa, small crustaceans like Daphnia, Cyclops etc. As they grow, their food also changes and they consume larger preys like tadpoles, small fishes besides larvae of aquatic insects and even nymphs of their own species.

When the time for emergence of the imago arrives, the nymph stops eating, and appears swollen. The nymph leaves the water, climb up some suitable object or stem of water plant or even crawl up the banks and climb on stems of plants there and attach itself supported by legs. After a while, the larval skin splits along the mid-dorsal line of the thorax, the fracture extending forwards to the head. The head, thorax, legs and wings are drawn out first, the abdomen remaining still within the larval skin. After a short while, the insect bends up and grasps the supporting object with the help of its legs and draws out the remaining part of the body from the larval skin. The wings expand quickly, and once they are dry, the imago flies away.

STRUCTURE OF AN ADULT ODONATE (IMAGO)

Like all insects, the body of an Odonate is divided into three parts, namely, the head, the thorax and the abdomen. The external structure of an Odonate is a mixture of primitive yet, highly specialized characteristics.



1. Labrum
2. Clypeus
3. Vesicle
4. Eye
5. Humeral marking
6. Arc
7. Sectors of arc
8. Subcosta
9. Node
10. Costa
11. Pterostigma
12. R_1
13. R_2
14. R_3
15. IR_3
16. R_{4+5}
17. M A
18. Cu_2
19. IA
20. Post analcells
21. Brace of pterostigma
22. Forking of Rs
23. Anal loop
24. Tornus
25. Analtriangle
26. Oriellet
27. Anal appendages
28. Abdomen
29. Subtrigona
30. Discoidial cell
31. Post nodals
32. Antenodals
33. Femur
34. Tibia
35. Tarsals
36. Claw
37. Occiput
38. Frons
39. Antenna
40. Middorsal carina
41. Prothorax

Fig. 3. External morphology of a dragonfly (after Mitra, 2002)

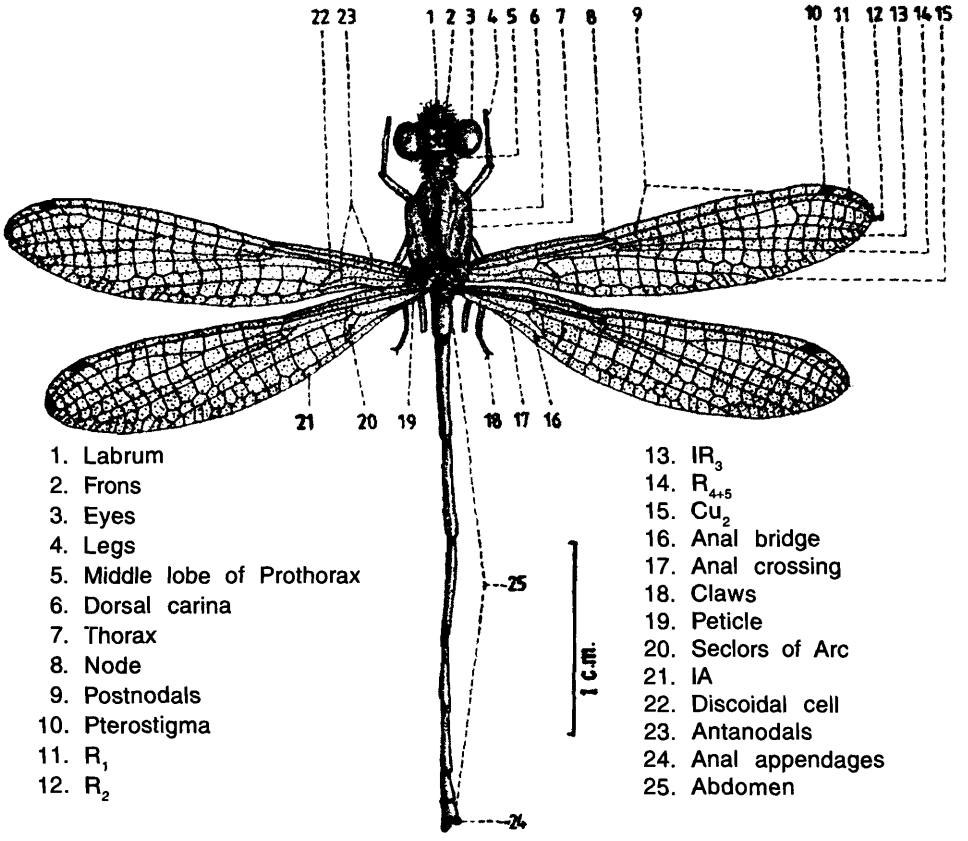


Fig. 4. External Morphology of a damselfly

The Head : The head is large, and can be rotated sideways, downwards, forwards and backwards. A pair of very large compound eyes covers almost the entire portion of the head. In the Zygoptera, these eyes are widely separated, whereas in the Anisoptera except in members of the families Gomphidae and Cordulegasteridae they meet in the middle line. The ocelli, or simple eyes are present on the vertex, the space between the eyes. The ocelli are used for very near vision. The antennae are very short, composed of 3 to 7 segments. The other parts of the head *viz.*, labrum, labium, clypeus, frons or forehead occupy a very small area. The mouthparts are of biting type, adapted for predatory life. The mandibles are stout with very powerful teeth and the maxillae carry a lobe like unsegmented palp, while the labium modified as lateral lobes and hooks forms the labial palps.

The Thorax : The middle part of the body, the thorax, consists of three segments. The first segment or prothorax is made up of anterior, middle and posterior lobes. The posterior lobe is involved in mating, and the shape will be different in various genera and species. The prothorax serving the function of a neck helps in rotating the head. The remaining two segments, the meso and meta thorax are fused together forming the synthorax or the pterothorax. The legs are attached anteriorly beneath the thorax to facilitate holding the prey close to the mouth. The wings are attached posteriorly. Markings on the thorax help in identifying the species.

The Wings : The damselflies have almost identical forewings and hind wings which they hold together vertically over the body when at rest, except in some members of the subfamily Lestinae, that hold their wings partially open. The dragonflies have forewings dissimilar to the hind ones and they spread their wings at right angles to their bodies when they rest. The wings can be hyaline or coloured, either partly or entirely. The venation is highly specialized. The important parts of the wings are follows :

Costa : The anterior border of wing from base to apex.

The Node : An artificial joint on the costa, situated variably, either in the middle or proximally to the middle of the costa.

Pterostigma : A thickened, chitinised, and variably shaped cell situated on the costal margin near the apices of the wings. It may be absent in one or both wings, or in one of the sexes, or may differ in shape in fore wings and hind wings in the male.

Nervures : The ribs, on which the membrane is built. It comprises of the costa, subcosta, radius, median, cubital and anal nervures.

Discoidal cell : A triangular or quadrilateral cell, from which other nervures originate, found near the base of each wing. This cell is triangular in shape and made up of two cells in Anisoptera, but in Zygoptera, it is a single quadrilateral cell, sometimes divided into two to five cells or reticulated as in the genus *Ictinus*.

Subnode : The oblique nervure descending from the node.

Antenodal and Postnodal nervures : Nervures lying between the costa and the subcosta, before and after the node.

Median space/Basal space : An elongated space or cell at the base of the wings, which may be traversed by nervures or free of nervures.

Arc : A short, oblique, transverse nervure near the base of wings, which forms the outer boundary of the median space.

Cubital space : Found beneath and parallel to the median space, extending out as far as the base of the discoidal cell. It is traversed by one or many nervures called cubital nervures.

Anal bridge : A short nervure, running parallel to the hind border of the wing and passing below the discoidal cell, either complete or incomplete and even absent in certain genera of Zygoptera

Anal crossing : A short nervure situated at the base of the wing extending from the Cubital and first Anal Veins to the anal bridge or up to the hind border of the wing.

The Legs : The leg is made up of five segments; starting from the base, they are the coxa, trochanter, femur, tibia and tarsus. The coxa is short and conical in shape; the trochanter is divided into two parts; the femur is long with two rows of spines, the number of spines varying between species and sex; the tibia is slender with bristles on the sides and is the longest segment and the tarsus is made up of three parts, the distal part being the longest and ending in two claws. The characters on the distal part of the tarsus are useful in the identification at genus level.

The Abdomen : Usually long and cylindrical or dorsoventrally flattened as in many anisopterans. It consists of ten segments. In male, the ventral side of segments 2 and 3 are modified to form secondary (accessory) genitalia, and in some anisopterans in addition to this, a ventrolateral process called auricle or oreillets are also present. In both sexes, paired, unsegmented superior anal appendages lie behind the tenth segment, which are the modified form of the cerci. Paired inferior anal appendages are present in male zygopterans where as only a single, median, inferior appendage is seen in male anisopterans. In male, the gonopore opens ventrally on segment 9; sperm is transferred from here to a storage vesicle on the secondary genitalia present on segment 3 by bending the abdomen. Penis extends from segment 2.On either side of the penis, is a pair of hamules, used for holding and guiding the female genitalia during copulation. In female Zygoptera and in some Anisoptera, a well-developed ovipositor and a terebra are present. The terebra, is used for cutting, piercing and sawing the tissues of submerged aquatic plants enabling them to insert their eggs into the plant tissues, a process known as, endophytic oviposition. Most female anisopterans have a small, reduced ovipositor known as vulvar scale, but in some species, the sterna 9 and 10 are excavated to form a cavity for the temporary storage of egg masses extruded from the gonopore. Quite contrary to the egg laying habits seen in Zygoptera, the Anisoptera do not insert their eggs into the plant tissues.

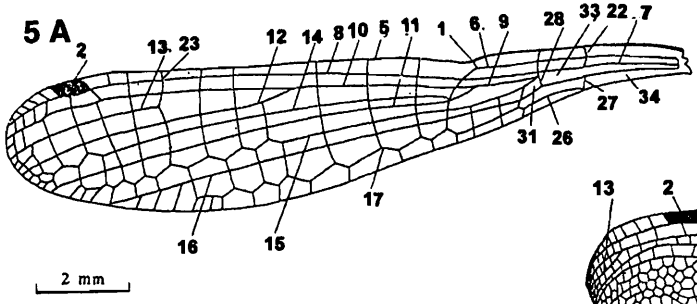


Fig. 5. A. Left hind wing of a damselfly

1. Nodus; 2. Pterostigma; 3. Tornus; 4. Membrane; 5. Costa; 6. Subcosta; 7. R+M (radius and medius combined at base of wing); 8. R1 (1st branch of radius); 9. Rs (radial sector); 10. R2 (2nd branch of radius); 11. R4+5 (4th and 5th branches of radius combined); 12. R3 (3rd branch of radius); 13. IR2 (intercalated branches of radius and medius); 14. IR3 (intercalated branches of radius and medius); 15. MA (medius or anterior median vein); 16. Cu2 (Posterior cubital vein); 17. IA (Anal vein); 18. Rspl (redial supplementary vein); 19. Mspl (medial supplementary vein); 20. Costal cross vein; 21. Subcostal cross vein; 22. Antenodals; 23. Postnodals; 24. Primary antenodals; 25. O (oblique cross-vein); 26. Anal bridge; 27. Anal cross vein; 28. Arc (arculus); 29. Br (brace of pterostigma); 30. Sn (subnode); 31. St (subtrigone); 32. discoidal cell, 33. Ht (hypertrigone); 34. median space; 35. Cubital space; 36. Bg (Bridge); 37. Anal area; 38. Anal loop.

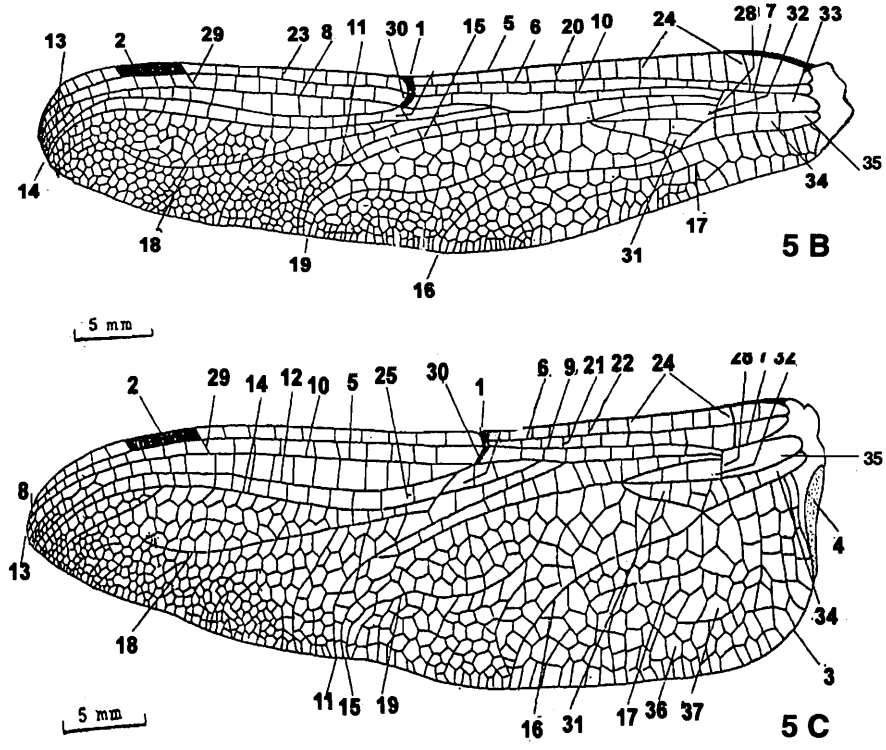


Fig. 5. B&C. Left fore and hind wing of a dragonfly

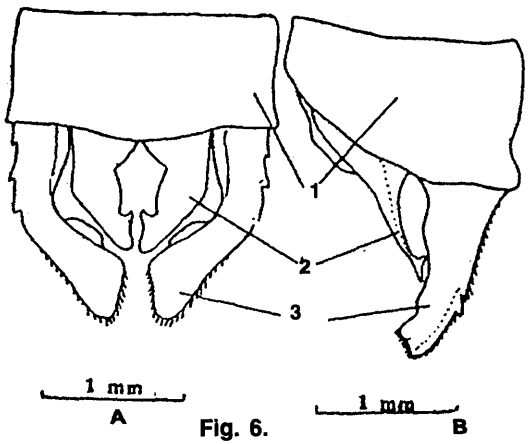


Fig. 6.

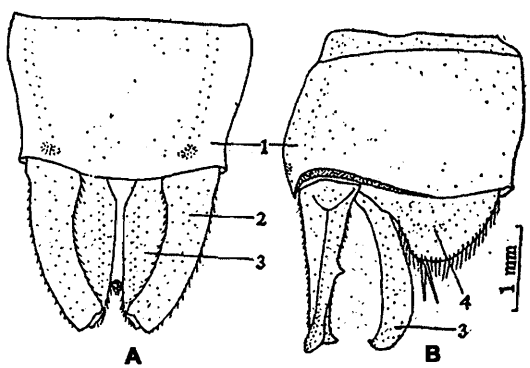


Fig. 7.

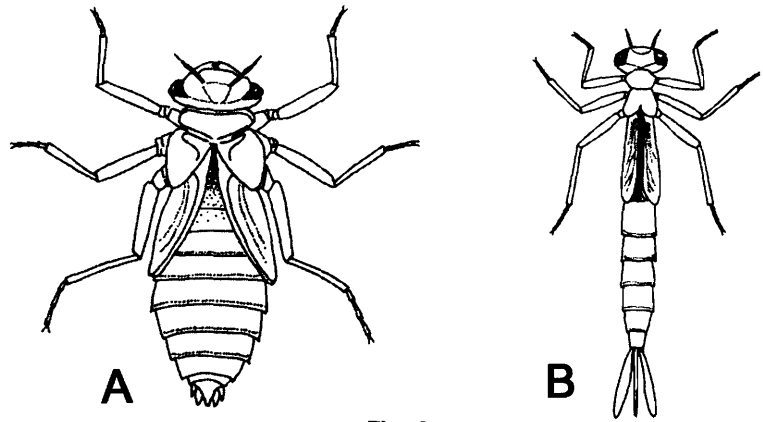


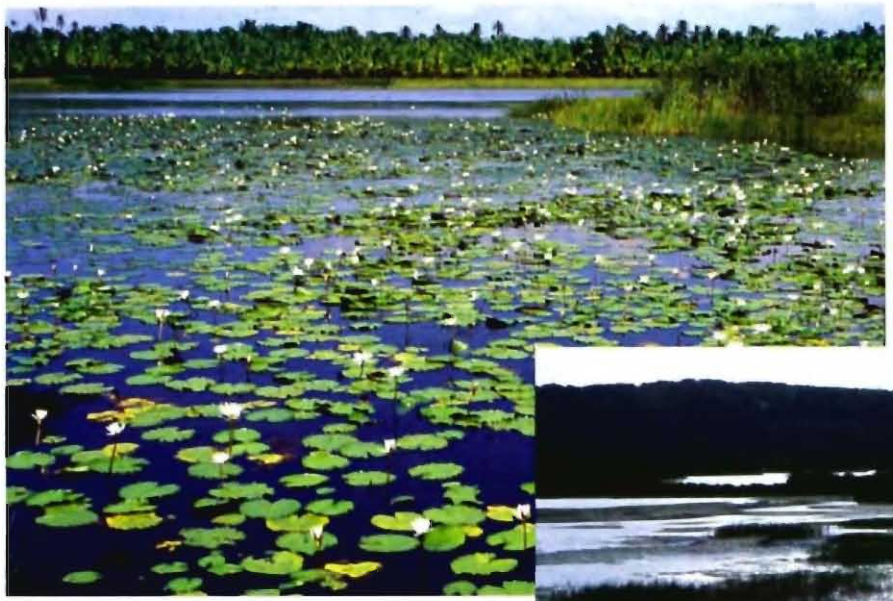
Fig. 8.

Fig. 6. : Male anal appendages of a damselfly
A. Dorsal view; B. Lateral view.
1. Tenth abdominal segment
2. Inferior anal appendage
3. Superior anal appendage

Fig. 7. : Male anal appendages of a dragonfly
A. Dorsal view; B. Lateral view.
1. Tenth abdominal segment
2. Superior anal appendage
3. Inferior anal appendage

Fig. 8. A. : Nymph of a dragonfly

Fig. 8. B. : Nymph of a damselfly



A freshwater lake

A backwater swamp

Fig. 9. : Breeding environs of Odonates

SYSTEMATIC ACCOUNT

Family COENAGRIONIDAE

1. *Ceriagrion cerinorubellum* (Brauer)

Diagnosis : Only two antenodal nervures onwings; a prominent ridge on the frons; no post ocular coloured spots on head; eyes dark olivaceous above, paler below in both sexes; in male, thorax green, changing to blue on the sides, yellow beneath; abdomen bright red at base and anal ends, black on dorsum in between; in female, the dorsum of thorax often suffused with ochreous or golden brown, pruinosed white beneath the thorax in adults; abdomen similar to the male, but the end segments usually a duller brownish red.

Size : Male – abdomen, 31 to 33 mm; hind wing, 20 to 21 mm. Female – abdomen, 31 to 35 mm; hind wing, 20 to 21 mm.

Habits and Habitat : Found in widely distributed colonies, around ponds, tanks and slow running streams.

Breeding : Breeds in temporary pools and canals infested with aquatic vegetation.

Distribution : Throughout India.

2. *Ceriagrion coromandelianum* (Fabricius)

Diagnosis : Antenodal nervures, frons and post ocular spots same as in *C. cerinorubellum*; eyes olivaceous above, pale greenish-yellow below; in male, thorax uniformly olive-green, tinted with ochreous on dorsum, laterally citron-yellow, thinly pruinosed white beneath; abdomen bright citron yellow, without markings; in female, thorax golden olivaceous brown, paler at the sides and beneath, usually thinly pruinosed; abdomen uniformly olivaceous or with golden brown tint on dorsum, which deepens some what on the hinder segments.

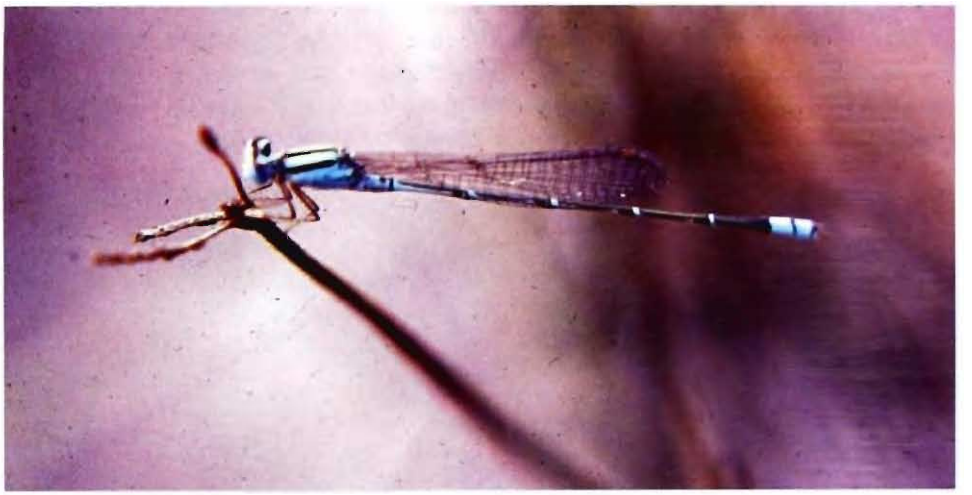
Size : Male – abdomen, 28 to 30 mm; hind wing 18 to 20 mm. Female – abdomen, 29 to 32 mm; hind wing 20 mm.

Habits and Habitat : Found around ponds, tanks and streams; females are commonly found in scrub jungles nearby the water bodies.

Breeding : Breeds in weedy water, having two or three generations in a year. Oviposition is endophytic and eggs are laid irregularly in the submerged vegetation. While ovipositing, the female stays in tandem.

Distribution : Throughout India.

3. ***Pseudagrion microcephalum*** (Rambur)



Diagnosis : No ridge on frons; post ocular coloured spots always present; pterostigma longer than broad, diamond shaped, distal and proximal sides very oblique; in male, eyes palest sky blue beneath, deepening to dark azure blue above; face, frons, vertex and occiput blue or green, marked with black; thorax azure blue on dorsum and sides, marked with medial and humeral black stripes; abdomen azure blue, marked with black, dorsal marking on segment 2 goblet shaped; in female, eyes palest blue beneath, olive green in the upper half, deepening on the summit; face and vertex olivaceous suffused with orange; thorax bluish green, richly suffused with golden orange on dorsum, azure blue laterally, black markings similar to the male; abdomen coloured similar to the male, while marking on segment 2 with a thick dumbbell-shaped dorsal mark extending from the base to apex, shortly stalked at the latter.

Size : Male – abdomen 27 mm; hind wing, 17 mm. Female – abdomen, 29 mm; hind wing 20 mm.

Habits and Habitat : Found in the plains. Migrates in large numbers with *Pseudagrion decorum* along the west coast, during October and September. Found in both temporary and permanent water bodies.

Breeding : Breeds in stagnant marshy waters and streams. Oviposition is endophytic, inserting eggs in submerged aquatic vegetation like Water Lily. A spurt in population can be noticed during September and October.

Distribution : Throughout the plains of India, Burma, Sri Lanka and Australia.

4. ***Pseudagrion rubriceps rubriceps*** (Selys)

Diagnosis : Ridge on frons, post ocular spots, pterostigma etc. same as in the previous species; in male, eyes olivaceous green above, changing rapidly to bright rich orange and then golden yellow, and faintly bluish beneath; face, frons and vertex bright reddish-orange or dark

ochreous; thorax golden green on dorsum, azure blue on sides, mid dorsal carina finely black and a some what thicker black line running close to and parallel with it on each sides; abdominal segments 9 and 10 azure blue, unmarked; in female, eyes dark blue above, paling to azure blue below; face and vertex uniformly dark olivaceous with the post ocular spaces finely margined in black; thorax with markings similar to the male, but the ground colour of the dorsum a dull bluish green; abdomen with dorsal markings broader, segment 9 with a basal bifid dorsal marking.

Size : Male – abdomen, 29 mm; hind wing, 18 to 20 mm. Female – abdomen, 29 mm; hind wing, 21 mm.

Habits and Habitat : Adults fly low, amidst the vegetation. Eggs are laid above water level or in submerged vegetation, on twigs or the under surface of leaves, in transverse rows.

Breeding : Breeds in perennial and temporary ponds, marshy streams and stagnant waters. It is a multivoltine species having three generations in a year.

Distribution : Widely distributed in the plains and submontane areas in India.

5. ***Aciagrion occidentale*** Laidlaw

Diagnosis : No ridge on frons; post ocular coloured spots always present; pterostigma in fore wing larger than that in the hind wing; abdomen usually very long and slender; female with an apical ventral spine on segment 8; ground colour blue with black markings on head, thorax and abdomen; eyes bottle green above, with a small black cap, palest blue beneath, changing through pale greenish yellow to the darker shade above; males very small and very slender; abdominal segment 8 with a black elongate dorsal triangular mark, its base at apex of the segment and the apex of the mark nearly reaching base of the segment; female somewhat similar to the male, but much more robust and with a stouter abdomen; markings entirely similar to those of males; abdominal segment 8 with the dorsal marking much broader and of almost even width throughout.

Size : Male – abdomen, 23 to 24 mm; hind wing, 15 to 16 mm. Female – abdomen, 24 mm; hind wing, 16 mm.

Habits and Habitat : A migratory species; widely distributed in montane and submontane areas in open grass besides weedy ponds and herbage.

Breeding : Common during post monsoon, mixing with *Agriocnemis pygmae* and *Pseudagrion microcephalum*. Breeds in weedy waters.

Distribution : Throughout South India, Central India and Sri Lanka.

6. *Ischnura aurora aurora* (Brauer)

Diagnosis : Pterostigma differing in shape and size in fore and hind wings of male; segment 10 of male with a pair of dorsal apical tubercle which is closely apposed; post ocular coloured spots always present in adult stage; species with ground colour of males and isochrome females blue or pale grass green; eyes in both sexes olive-green, dark olive above, pale olive beneath; in male, thorax bronzed black on dorsum, marked with narrow grass-green ante humeral stripes; wings hyaline, pterostigma in the fore wing kite shaped, rose red for its proximal half, hyaline for the distal, in hind wing, much smaller, about half the size, uniform pale grey; abdomen citron yellow, except segments 8 to 10, which are azure blue; female stouter than male; wings hyaline, pterostigma palest pink, shape and size similar to that of the male; thorax palest yellow on the sides, almost white beneath; abdomen with a broad black dorsal stripe extending the whole length, but interrupted by narrow yellow annules.

Size : Male – abdomen, 16 to 20 mm; hind wing, 10 to 12 mm. Female – abdomen 18 to 20 mm; hind wing, 14 to 15 mm.

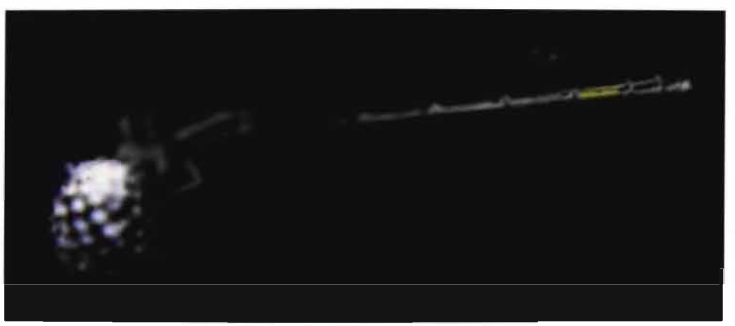
Habits and Habitat : Multivoltine species, found near weedy banks of large rivers and around temporary monsoon ponds.

Breeding : Breeds in temporary pools during monsoon months.

Distribution : Throughout India.

7. ***Agriocnemis pygmaea*** (Rambur)

Diagnosis : Small species; arc situated distal to the level of the distal ante nodal nervure; the junction of anal bridge and IA (medio-anal link) markedly angulated; only 6 to 8 post nodal nervures in fore wings; eyes black above, pale apple green on the sides and beneath; in male, labrum metallic blue;



thorax black on dorsum, marked with narrow ante humeral apple green stripes, laterally apple green; wings hyaline, pterostigma pale yellow in the fore wings, black in the hind wings; abdominal segments 1 to 6 with the ground colour pale greenish yellow marked with bronzed black, the terminal segments brick red; females more robust than male, and exhibiting a number of polychromatic forms which seem to depend largely on the age of the specimens, although not entirely so.

Size : Male – abdomen, 16 to 17 mm; hind wing, 9.5 to 10 mm. Female – abdomen, 18 mm; hind wing, 11 to 12 mm.

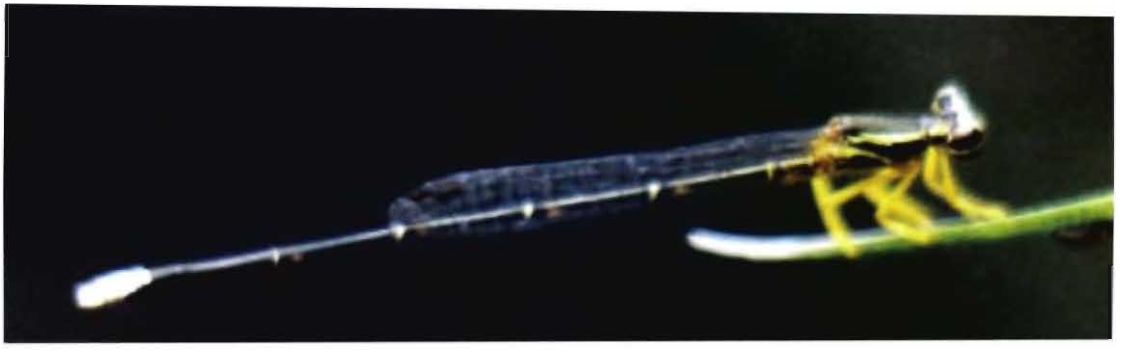
Habits and Habitat : Adults can be found near water bodies and amidst vegetation.

Breeding : Breeds in temporary ponds, also in slow running marshy streams; this species is multivoltine with three generations.

Distribution : Throughout the Oriental Region, Australia and Pacific Islands.

Family PLATYCNEMIDIDAE

8. ***Copera marginipes*** (Rambur)



C. marginipes shows an infinite number of varieties, not only according to the age of specimens, but also according to their locality; tenerals being white with black markings.

Diagnosis : Eyes black above, greenish at sides and beneath, and with a narrow equatorial black band encircling them; in males, legs variably bright orange to dull reddish, the posterior two pairs of tibiae moderately broadly dilated and about equal in length to the same femora; anal appendages pale yellow to white, superior anal appendages only one- fourth the length of inferiors; female with posterior lobe of prothorax without spines; legs brownish white or carneous, femora with a speckled band or striated black stripe running their whole length, tibiae not dilated; *Size* : Male – abdomen, 28 to 31 mm; hind wing, 16 to 18 mm. Female – abdomen, 29 to 30 mm; hind wing, 20 mm.

Habits and Habitat : The species is fond of running water. Abundant during rainy season.

Breeding : Breeds in standing water with reeds and marshy vegetation.

Distribution : Throughout India.

9. ***Copera vittata*** (Selys)

Diagnosis : Eyes capped with black above, below this olivaceous green, marked with a narrow black equatorial belt; in male, legs shorter, tibiae slightly dilated, reddish; superior anal appendages at least half the length of inferiors; in female legs yellow, all femora with the speckled beaded band on extensor surface; posterior lobe of prothorax with a pair of divergent, slender, forwardly directed spines.

Size : Male – abdomen, 28 to 34 mm; hind wing, 16 to 18 mm. Female – abdomen, 28 to 30 mm; hind wing, 18 mm.

Habits and Habitat : Usually found near the streams and ponds. A weak flier.

Breeding : Breeds in clear water.

Distribution : Western Ghats.

Family CALOPTERYGIDAE

10. *Neurobasis chinensis chinensis* (Linnaeus)

Diagnosis : A brilliant metallic blue or green species; more than two ante nodal nervures presnt on the wings; in male, upper two thirds of eyes blackish brown, lower third bluish green, the two areas sharply defined; thorax and abdomen brilliant metallic green; fore wings hyaline, hind wings opaque and coloured partly with brilliant metallic green and blue, pterostigma absent in male; in female, upper two thirds of eyes brownish black; thorax as in male, abdomen dull metallic bronzy green, with golden reflections on dorsum; all wings of female hyaline but with an opaque whitish spot at node, pterostigma false and whitish.

Male

Female

Size : Male – abdomen, 45-50 mm; hindwing, 32-38 mm. Female – abdomen, 44-50 mm; hind wing 36-40 mm.

Habits and Habitat : Usually found near the densely shaded streams.

Breeding : Breeds in montane and submontane streams.

Distribution : Throughout India.

11. ***Vestalis apicalis apicalis*** Selys

Diagnosis : Another brilliant metallic blue or green coloured species; pterostigma absent; tips of wings black; upper two thirds of eyes brown, the rest olivaceous or yellow in both sexes; in male, labrum yellow, marked with black; thorax and abdomen brilliant metallic emerald green; in female, labrum usually with a basal line in continuation with the medio-basal black spot; thorax similar to the male; abdomen more coppery and less metallic than in male.

Size : Male – abdomen, 49-55 mm; hindwing, 36-39 mm. Female – abdomen, 46-50 mm; hind wing, 38-40 mm.

Habits and Habitat : This species is found inhabiting the rides of open spaces in forests, and along some shaded pathways, occupying almost every twig in the vicinity.

Breeding : Breeds in montane and submontane streams.

Distribution : Throughout India.

12. ***Vestalis gracilis gracilis*** (Rambur)

Diagnosis : Both sexes coloured brilliant metallic green or blue; tips of wings hyaline, wings with iridescent colours of mother of pearl or blue in some lights; eyes with upper two thirds dark brown, the rest greenish yellow; in male, thorax brilliant metallic emerald green; abdomen metallic green or blue, usually peacock-blue in teneral specimens, emerald green when mature; female exactly similar to the male in colour and markings, but abdomen usually more dull metallic.

Size : Male – abdomen, 45-56 mm; hind wing, 34-38 mm. Female – abdomen, 43-50 mm; hind wing 36-39 mm.

Habits and Habitat : Same as that of *V. apicalis*, this species can be found along with *V. apicalis*.

Breeding : Same as that of *V. apicalis*.

Distribution : Throughout India.

Family CHLOROCYPHIDAE

13. ***Rhinocypha (Heliocypha) bisignata*** (Selys)

Diagnosis : Epistome tumid and projecting markedly, like a nose in front of face; abdomen shorter than wings; pterostigma present in all four wings of both sexes, eyes brown; wings coloured, at least partly in male; fore wings with outer fourth or more opaque with brilliant coppery colouration, hind wing nearly same as fore wing, only apical third of hind wing opaque, a single row of short vitreous spots; pterostigma black in all wings; mesothoracic triangle large and coloured pink, extending from one-third to half way up dorsum; legs black, the two posterior pair of tibiae and femora pruinosed white; in female, the mesothoracic triangle black, finely outlined in yellow, as also the mid dorsal carina; wings entirely hyaline, tinted palely with yellow, apices narrowly enfumed; pterostigma black, with pale creamy center; legs black, not pruinosed.

Size : Male – abdomen, 20 mm; hind wing 24-26 mm. Female – abdomen, 16 mm; hind wing 22 mm.

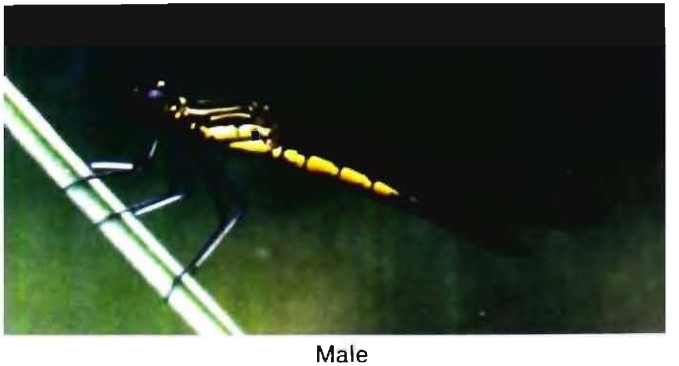
Habits and Habitat : Found on the twigs and leaves of plants near streams.

Breeding : Breeds in hill streams with rocky boulders.

Distribution : South India, Eastern India and Maharashtra.

14. ***Libellago lineata indica*** (Fraser)

Diagnosis : Small insect; in male, eyes brown, but with a bluish metallic lusture in certain lights; thorax black, marked with citron or greenish-yellow; legs black, flexor surfaces of tibiae and of anterior pair of femora pruinosed white; wings hyaline, the bases of all palely tinted with amber, apices of fore wings tipped with black (absent in teneral specimens); pterostigma absent in fore wings, black, tumid and elongate in hind wing; abdomen 1 to 6 yellow with black markings on dorsum, 7 to 10 black; in female, eyes brown; thorax same as in male; wings hyaline, pale with amber tint, pterostigma present in all wings, creamy white in a black frame; legs yellow, femora lined externally with dark brown; abdomen largely yellow with black markings.



Male

Female

Size : Male, abdomen – 14 to 16 mm; hind wing – 15 to 18 mm. Female, abdomen – 13 to 17 mm; hind wing – 17 to 20 mm.

Habits and Habitat : A common damselfly seen throughout South India, especially in the Western Ghats and Deccan; usually found on the blades of grasses or twigs near slow running streams.

Breeding : It is a bivoltine species, found throughout the year.

Distribution : Karnataka, Kerala, Maharashtra and Western Ghats.

Family EUPHAEIDAE

15. ***Euphaea fraseri*** (Laidlaw)

Diagnosis : Face depressed and sloping; abdomen always longer than wings; discoidal cell traversed; tenth segment with one dorsal spine; eyes dark brown; fore and hind wings of male differently shaped, hind pair at least with some opaque markings; hind wings of male usually much shorter than fore wings and markedly rounded at the apex, the apical half or less, opaque black and sometimes bearing a brilliant metallic blue spot; abdomen bright red; ante humeral stripes on thorax bright azure blue. In female, wings hyaline, palely enfumed, apices in many specimens broadly dark brown; abdomen black, marked with bright greenish yellow.

Size : Male, abdomen – 36 to 41 mm; fore wing 34 to 38 mm; hind wing 29 to 35 mm. Female, abdomen – 33 to 34 mm; hind wing 31 to 33 mm.

Habits and Habitat : Usually found in lower elevation, near the streams and water bodies.

Breeding : Breeds in hill streams.

Distribution : Endemic to the Southern Western Ghats.

Family GOMPHIDAE

16. *Ictinogomphus rapax* (Rambur)

Diagnosis : Eyes widely separated and bluish grey in colour; discoidal cells unequal, that of hind wing more elongate than that of fore wing; median space never traversed; discoidal cell, hypertrigone and subtrigone of fore wing traversed or reticulated; in male, face and frons greenish yellow; thorax and abdomen black, marked with yellow or greenish-yellow; segment 8 of abdomen widely dilated and with wing like lateral projections and with a broad yellow ring present; female very similar to the male; the yellow markings more extensive; vulvar scale black, deeply cleft into 2 narrow tongue like process which extend nearly to the base of segment 10.

Size : Male, abdomen – 0-52 mm; hind wing – 40 mm. Female, abdomen 50 mm; hind wing 42 to 44 mm.

Habits and Habitat : This species is a fast flier, but can be seen resting on prominent twigs facing water, head inclined downwards and abdomen held upwards; if disturbed, dives gracefully towards the surface of the water, and then flies and turns, swiftly off along the borders of the pond or stream or usually returning to the initial resting place again and again; pairing takes place over water, the insect then rising and disappearing high over the top of trees; the males frequently engage in fierce combats especially if females are nearby.

Breeding : Breeds both in running and still waters.

Distribution : Throughout India.

17. ***Gynacantha dravida*** Lieftinck

Diagnosis : Large species; eyes more or less broadly confluent on vertex and olivaceous in both sexes; discoidal cells approximately of the same size and shape in fore and hind wings and situated equally distant from the arc; pterostigma long and narrow, without any opaque cells beneath it; dentigerous plate of female ending in two long curved divaricate spines; segment 3 of abdomen nearly always markedly constricted; upper surface of frons marked with a thick black T; inferior anal appendage considerably less than half the length of superiors; thorax without well defined dark stripes; wings never tipped with dark brown; wings unmarked at base; abdominal segments 3 – 8 with a dark brown oblique fascia extending from apical border to jugum and paling from apex to base; very old adults with brighter markings; female, exactly similar to the male in colour and markings and very rarely developing any brighter markings in adult age; wings in very old specimens deeply and evenly enfumed throughout with reddish brown.

Size : Male, abdomen – 50 to 58 mm; hind wing 43 to 50 mm. Female, abdomen (excluding appendage) – 48 to 55 mm; hind wing 44 to 50 mm.

Habits and Habitat : This species has a crepuscular habit, their major food is mosquitoes and microlepidoptera; during the day time, they may remain concealed in the thick bamboo plantations or thick jungles or inside the houses and during the night, they get attracted to the light and can be easily collected.

Breeding : Breeds in stagnant water bodies.

Distribution : Throughout India.

Family LIBELLULIDAE

18. ***Tetrathemis platyptera*** Selys

Diagnosis : Base of discoidal cell in hind wing widely distal to level of arc; costal side of discoidal cell in fore wing markedly angulated, so that the cell is four sided; discoidal field beginning with only 1 row of cells; vesicle, upper part and sides of frons brilliant metallic prussian-blue; eyes emerald green during life in both sexes; thorax black with a bronze-green reflection, marked broadly with citron-yellow; wings basally tinted with yellow; abdomen black, marked with citron-yellow; female exactly similar to the male, but the wings, a much richer and deeper tint of amber over the basal area.

Size : Male, abdomen – 15 to 18 mm; hind wing 18 to 21 mm. Female, abdomen –14 to 16 mm; hind wing 19 to 24 mm.

Habits and Habitat : Active during rainy season. Often found in marginal vegetation adjoining ponds and wells.

Breeding : Breeds in stagnant waters, often in wells or pools in marshy places; female deposits eggs on objects overhanging water.

Distribution : Throughout India.

19. ***Brachydiplax sobrina*** (Rambur)

Diagnosis : Eyes more or less broadly confluent on vertex; greenish during life; discoidal cells differing in size and shape in fore and hind wings that of fore wing situated far distal of the arc; base of discoidal cell in hind wing at level of arc or a shade distal; frons metallic above; in male, thorax olivaceous brown to greenish-yellow, with black or metallic markings, pruinosed on dorsum and sides; in sub adult males, markings steely metallic black on a pale yellow background; abdomen black, pruinosed blue in old adults, but marked with yellow in sub adults and tenerals; female similar to the teneral male but ground colour of thorax brighter yellow and the metallic black stripes broad.

Size : Male – abdomen, 20 to 24 mm; hind wing, 25 to 28 mm. Female – abdomen, 16 to 22 mm; hind wing 22 to 26 mm.

Habits and Habitat : Subadult males and adult females can be seen perching on twigs in scrub-jungle, near the larval habitat.

Breeding : Breeds in small weedy tanks and ponds.

Distribution : Assam, Bihar, Kerala, Uttar Pradesh, Himachal Pradesh, Punjab, Maharashtra, Meghalaya, Orissa, Rajasthan, West Bengal and Western Ghats.

20. *Cratilla lineata* (Brauer)

Diagnosis : Upper surface of frons dark metallic blue or green; eyes dark bluish black; thorax steely or bronzed black, marked with yellow; wings hyaline, apices sometimes tipped with brown, adults enfumed brownish, anal loop very long and overlapping with the distal end of discoidal cell; abdomen black, marked with bright ochreous; female closely similar to male but abdomen relatively shorter and more robust; eyes reddish brown above, pale beneath.

Size : Male – abdomen, 26 to 31 mm; hind wing, 34 to 40 mm. Female – abdomen, 29 to 30 mm; hind wing, 39 to 41 mm.

Habits and Habitat : This dragonfly found in high elevations of forests, is commonly seen perched on dead twigs with its wings sloped to the sides and body held close to and parallel with the twig.

Breeding : Breeds in marshy areas in deep jungle.

Distribution : Orissa, Uttar Pradesh, Western Ghats and Kerala.

21. ***Lathrecista asiatica asiatica*** (Fabricius)

Diagnosis : Upper surface of frons steely black or metallic blue-black; eyes reddish brown above, grayish below; in male, thorax dark coppery-brown on dorsum, bright yellow laterally, dorsum in sub adults bright coppery brown with a pair of narrow parallel yellow stripes, laterally two black 'Y' shaped markings with a narrow black stripe between; wings hyaline with apices usually more or less enfumed; abdomen red; female resembles the male closely except for the colour of abdomen, which is rich olivaceous-brown.

Size : Male – abdomen, 27 to 32 mm; hind wing 33 to 37 mm. Female – abdomen, 27 to 32 mm; hind wing, 34 to 36 mm.

Habits and Habitat : This is a shy insect and, with rapid flight; usually found in colonies.

Breeding : Breeds in forest pools, situated usually in heavy bamboo jungles.

Distribution : Sparingly distributed over the plains of India, except in dry zones.

22. *Orthetrum chrysis* Selys

Diagnosis : Males bright red; frons bright scarlet –red; eyes red during life; thorax dark ferruginous, and the abdomen bright blood-red; wings hyaline, with a dark golden-amber coloured spot at base of hind wing extending to the first antenodal nervure; lamina of male genitalia with a tuft of stiff black bristles; in female, the red replaced by bright ochreous throughout; wings without any vestige of yellow basal marking.

Size : Male – abdomen, 28 to 33 mm; hind wing, 31 to 38 mm. Female – abdomen, 25 to 30 mm; hind wing, 31 to 36 mm.

Habits and Habitat : Usually found around gardens and brooks infested with macrophytes.

Breeding : Breeds in pools and marshes near small brooks and submontane streams.

Distribution : Himachal Pradesh, Orissa, south Andaman Islands and Western Ghats.

23. ***Orthetrum luzonicum*** (Brauer)

Diagnosis : Face and frons pale bluish or greenish yellow; eyes bluish green capped violet; in sub adult male, thorax pale olivaceous green dorsally with some clouding of brownish along mid dorsal carina, a broad reddish brown humeral stripe bordered in front with black; abdomen pruinosed blue; in very old adults, thorax and abdomen pruinosed pale azure blue except at sides of segments 1, 2 and base of 3 bright yellow; wings hyaline, Cuii in hind wing arising from the distal side of discoidal cell well away from its posterior angle; female similar to the sub adult male in colour and markings but usually paler and the dark markings less extensive.

Size : Male – abdomen, 28 to 30 mm; hind wing, 30 to 32 mm. Female – abdomen, 28 to 32 mm; hind wing 30 to 32 mm.

Habits and Habitat : Found in the montane and submontane areas.

Breeding : Breeds in marshy and swampy areas.

Distribution : Extends throughout India.

24. ***Orthetrum pruinosum neglectum*** (Rambur)

Diagnosis : Male violaceous red due to a thin overlying pruinescence; eyes blue black above, bluish grey below; frons blue-black anteriorly; thorax reddish-brown to dull purple according to pruinescence present; wings hyaline, enfumed pale brown towards apices in old adults and with a reddish-brown basal marking in hind wing; abdomen bright vermilion red in sub adults; purplish red in adults due to pruinescence; female dull ochreous with all stripes and sutures black; frons pale olivaceous brown; eyes yellowish capped with brown; wings similar to male.

Size : Male – abdomen, 28 to 31 mm; hind wing, 32 to 36 mm. Female – abdomen, 30 mm; hind wing 37 mm.

Habits and Habitat : Usually seen around forest streams.

Breeding : Breeding takes place in slow running streams, perennial and seasonal monsoon ponds, paddy fields and cemented tanks.

Distribution : Throughout India.

25. ***Orthetrum sabina sabina*** (Drury)

Diagnosis : Eyes more or less broadly confluent on vertex and greenish in colour during life; never less than 12 antenodal nervures in fore wing; both sexes coloured black with yellow markings; abdomen enormously swollen at base and then abruptly slimmed and compressed laterally to the end; black marked with greenish yellow.

Size : Male – abdomen, 30 to 36 mm; hind wing, 30 to 36 mm. Female – abdomen, 32 to 35 mm; hind wing, 31 to 35 mm.

Habits and Habitat : This is the most predaceous dragonfly found in India; usually found near ponds and streams; during the cold weather they undergo hibernation.

Breeding : Breeding occurs in still water, marshy side pools of slow running streams, perennial and seasonal monsoon ponds.

Distribution : Widely distributed throughout India.

26. *Potamarcha congener* (Rambur)

Diagnosis : In adult male, thorax black, pruinosed more or less densely and appearing dark violaceous or blackish blue; in sub adults, yellow markings showing obscurely through the pruinescence; wings hyaline, extreme apices tipped with brown, sub adults have the costal area of both wings tinted with pale yellow; abdomen very variable in colouring according to age of individuals, completely pruinosed in old adults, partially so in younger specimens; eyes brown above, pale grayish beneath; female resembles the sub adult or teneral male in colour and markings and rarely pruinosed; thorax warm reddish-brown on dorsum, dull ochreous on the sides; abdomen black, marked with bright ochreous.

Size : Male – abdomen, 29 to 32 mm; hind wing, 33 to 35 mm. Female – abdomen, 29 to 31 mm; hind wing 33 to 37 mm.

Habits and Habitat : Found in large colonies in patches of jungle or scrub jungle near small slow running streams and commonly around seasonal monsoon ponds; larva is sluggish and bottom dwelling.

Breeding : Breeds in small weedy ponds and marshy areas.

Distribution : Throughout India.

27. ***Acisoma panorpoides panorpoides*** Rambur

Diagnosis : In both sexes, thorax azure blue marbled with black, forming a hieroglyphic pattern on dorsum and sides; abdomen azure blue, marked with black in adults; segments 1 to 6 dilated, 7 to 10 slim and cylindrical; eyes blue during life, behind glossy black spotted with yellow; in juvenile female, the colour pale ochreous; eyes dark brown above, pale below.

Size : Male – abdomen, 15 to 18 mm; hind wing, 16 to 21 mm. Female – abdomen, 15 to 18 mm; hind wing, 17 to 22 mm.

Habits and Habitat : An insect of plains and lower elevations with weak and short flights; usually found near the vegetation around heavily weeded tanks and other water bodies.

Breeding : It is a multivoltine species, with three generations in a year; breeding takes place in heavily weeded tanks and ponds.

Distribution : Widely distributed throughout India.

28. ***Brachythemis contaminata*** (Fabricius)

Diagnosis : In male, eyes violaceous brown above, pale olivaceous laterally and beneath; thorax olivaceous brown, ferruginous; wings hyaline, reticulation reddish with a broad bright orange fascia extending from base to within 2 to 3 cells of pterostigma; abdomen reddish ochreous, marked with obscure dorsal and subdorsal brown stripes; in female, eyes paler brown above; thorax pale greenish-yellow; hind wings very palely tinted with yellow at extreme base, reddish yellow medial fascia seen in male absent; abdomen pale olivaceous brown.

Size : Male – abdomen, 18 to 21 mm; hind wing, 20 to 23 mm. Female – abdomen, 18 to 20 mm; hind wing 22 to 25 mm.

Habits and Habitat : A common dragonfly, found in large numbers flying over weedy tanks and lakes; they are crepuscular in habits, flying more actively during evening until after dark.

Breeding : Breeds in marshes, ponds and streams.

Distribution : Throughout India.

29. ***Bradinopyga geminata*** (Rambur)

Diagnosis : In both sexes, pterostigma bicolorous, black with white ends; eyes brown above, pale grayish beneath; thorax and abdomen cinereous or dirty pale yellow, marbled and peppered with black in a very irregular manner or granite in colour.

Size : Male – abdomen, 26 to 29 mm; hind wing, 33 to 36 mm. Female – abdomen, 26 to 29 mm; hind wing 32 to 36 mm.

Habits and Habitat : This species is an example for cryptic colouration; often found settled on and breeding in cemented tanks and on granite rocks; towards dusk many of these insects have the habit of invading verandahs.

Breeding : Breeds in wells, cemented tanks and large steel drums containing water.

Distribution : Peninsular India.

30. *Crocothemis servilia servilia* (Drury)

Diagnosis : In male, eyes blood red above, purple laterally, paler below; labrum, face, frons and vesicle bright blood-red; thorax bright ferruginous, often blood-red on dorsum during life; wings hyaline, bases of all marked with rich amber yellow; abdomen blood-red; in female, eyes brown above, olivaceous below; labrum, face, frons and vesicle olivaceous yellow; thorax olivaceous brown, tinted with ferruginous, wings similar to male, but basal marking paler in tint and the neuration in this part bright yellow; abdomen ochreous. Teneral males and females are pale straw yellow coloured with pale yellowish-white humeral stripe on each side of thorax, and a subdorsal stripe of same colour running the length of abdomen.

Size : Male – abdomen, 24 to 35 mm; hind wing, 27 to 38 mm. Female – abdomen, 25 to 32 mm; hind wing 31 to 37 mm.

Habits and Habitat : Adults very common and found around slow running streams and perennial as well as seasonal monsoon ponds.

Breeding : It is a multivoltine species with three generations in a year.

Distribution : Throughout India.

31. ***Diplacodes trivialis*** (Rambur)

Diagnosis : In both sexes, eyes reddish brown above, pale bluish or yellowish below; face, frons and vesicle palest azure blue with a fine black line at base of frons; in sub adult male, thorax greenish-yellow or olivaceous with sutures finely black; legs greenish-yellow marked with black in sub adults, black marked with yellow in adults; abdomen greenish-yellow with sutures finely black; in very old adults, thorax and abdomen pruinosed blue; female resembles the sub adult male in colour and markings, but the abdominal markings broader; anal appendages creamy-white in both sexes.

Size : Male – abdomen, 19 to 22 mm; hind wing, 22 to 23 mm. Female – abdomen, 18 to 20 mm; hind wing 22 to 24 mm.

Habits and Habitat : One of the common dragonflies found in India; usually it wanders far from water and found settled on footpaths in open spaces.

Breeding : Breeds in swampy lakes.

Distribution : Throughout India.

32. *Neurothemis fulvia* (Drury)

Diagnosis : Eyes dark reddish brown above, golden brown below; in male, wings broadly dark reddish-brown from base to about middle of pterostigma, apex of wings also narrowly opaque brown to partly enclose a clear window in each wing at apex; neuration very close; many forms of females are found, varying from complete isochromes (having apex of fore wing completely clear and that of hind wing bordered with amber yellow but not opaque brown) to several different types of heterochromes (having the ground colour of head, thorax and body generally much paler or ochreous, with some dark brown clouding at apical halves of segments 3 to 7).

Size : Male – abdomen, 21 to 26 mm; hind wing, 27 to 32 mm. Female – abdomen, 20 to 24 mm; hind wing, 26 to 32 mm.

Habits and Habitat : Usually found in large colonies in low-lying swampy areas; abundant during August-September months; they have a weak flight.

Breeding : Breeds in weedy ponds or marshes

Distribution : Throughout India.

33. ***Neurothemis intermedia intermedia*** (Rambur)

Diagnosis : Eyes reddish brown above, golden yellow below; wings tinted with pale yellow or golden-yellow at base; reticulation open; base of wings golden-yellow to as far distal as outer border of discoidal cell or a few cells beyond; in male, yellow area at base of wings not very sharply defined and rather pale in colour; costal border of wings pale yellow to as far as pterostigma; female resembles the male in colour and markings of body; wings uniformly tinted with pale yellow, this diffusely deepened along costal area; basal marking of male entirely absent in female.

Size : Male – abdomen, 22 to 24 mm; hind wing, 24 to 27 mm. Female – abdomen, 21 to 24 mm; hind wing, 25 to 28 mm.

Habits and Habitat : Found near the banks of streams; very weak in flight.

Breeding : Breeds in monsoon pools and ponds, ovipositing during August and September.

Distribution : Throughout Peninsular India.

34. *Neurothemis tullia tullia* (Drury)

Diagnosis : Eyes blackish brown above, violaceous below in male; bases of wings broadly black; the black basal area of wings edged outwardly with an opalescent white band; female differs markedly from the male both in body colouring and markings and in markings of wings; eyes pale brown above, pale olivaceous laterally and beneath; the base of wings, to as far as two or three cells distal of node, bright amber-yellow; subcostal space from base of wing to node blackish brown, broadening at node into a very large blackish-brown spot which traverses wings nearly to posterior border, variably round, oval or triangular in shape in fore-wing, irregular or curved like a sickle in the hind; apices of all wings broadly opaque blackish brown to as far proximal as middle or inner end of pterostigma; the area between these two opaque areas with pale yellow neuration, including costa, and almost invisible.

Size : Male – abdomen, 16 to 20 mm; hind wing, 19 to 23 mm. Female – abdomen, 16 to 19 mm; hind wing, 20 to 23 mm.

Habits and Habitat : This species occurs in large colonies in heavily weeded tanks; it is found closely to the shelter of the herbage and has a weak, fluttering flight.

Breeding : Breeding in marshes and drainage channels of paddy fields.

Distribution : Throughout India.

35. ***Rhodothemis rufa*** (Rambur)

Diagnosis : In male, eyes bright scarlet, capped above with brown; thorax reddish-brown without markings; abdomen and anal appendages brilliant scarlet red; in female, eyes reddish-brown above, olivaceous below; thorax golden-brown laterally, blackish brown dorsally, with a bright citron-yellow stripe extending from front of dorsum backwards between the roots of wings, this stripe split into two elongate narrowly triangular antehumeral stripes by the dark brown mid-dorsal carina; abdomen dark golden-brown, with a bright citron-yellow stripe on mid-dorsum of segments 1 to 4, and on segments 5 to 8 or 9 by a pair of small dorsal basal spots; anal appendages brownish-yellow.

Size : Male – abdomen, 25 to 29 mm; hind wing, 32 to 37 mm. Female – abdomen, 25 to 29 mm; hind wing, 32 to 37 mm.

Habits and Habitat : Usually found near weedy tanks or settled on herbage in the vicinity there of.

Breeding : Breeds in weedy tanks and ponds.

Distribution : Throughout India.

36. *Trithemis aurora* (Burmeister)

Diagnosis : Beneath thorax marked with a black square with an angular black line crossing it; in male, vesicle and upper surface of frons metallic violaceous; eyes crimson above, brown laterally changing to lilaceous beneath; thorax and abdomen violaceous crimson with fine black markings on thorax; base of hind wing with a broad amber yellow fascia, with darker brown rays in subcostal and cubital spaces, neuration crimson; in female, eyes purplish brown above, lilaceous or grey below; frons yellow with a broad diffuse black basal line above; thorax pale olivaceous on sides, darker on dorsum with black stripes as in the male, but much more sharply defined; abdomen ochreous with black markings which vary in extent to almost obscuring the ground colour; wings tipped with brown to as far as middle of pterostigma, reticulation bright yellow to brown, basal marking similar as in male, but pale and without dark rays in subcostal and cubital spaces. In teneral male, abdomen bright ochreous in colour; wings have yellow neuration and the basal marking restricted; thorax yellow or olivaceous without any pruinescence and with black markings.

Size : Male – abdomen, 21 to 29 mm; hind wing, 24 to 34 mm. Female – abdomen, 19 to 27 mm; hind wing, 24 to 31 mm.

Habits and Habitat : A common dragonfly of the plains and submontane regions; adult males can be seen resting on vegetation near water bodies, making short beats up and down, but always returning to the initial resting place; females and teneral males always found taking rest away from water.

Breeding : Breeds in sluggish streams and irrigation channels, rather than in ponds and tanks.

Distribution : Throughout India.

37. ***Trithemis festiva*** (Rambur)

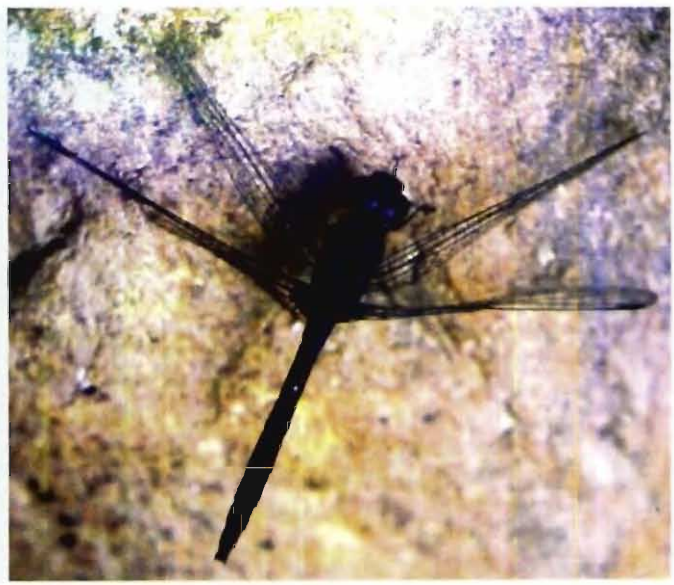
Diagnosis : Thorax with black angular marking as in previous species; in male, upper surface of frons and vesicle metallic violet; eyes dark brown above with purple reflex, bluish grey laterally and beneath; thorax and abdomen violaceous black; base of hind wing with a dark brown spot, subcostal and cubital spaces with dark rays, neuration black; abdomen moderately broad at base and tapered very gradually to the end; in female, frons and vesicle non-metallic; eyes dark brown above, lilaceous below; thorax greenish-yellow or olivaceous; wings similar to male, but in adults broadly dark reddish-brown at apices; abdomen cylindrical and of equal width throughout, bright yellow, marked broadly with black.

Size : Male – abdomen, 22 to 28 mm; hind wing, 26 to 32 mm. Female – abdomen, 21 to 24 mm; hind wing, 24 to 29 mm.

Habits and Habitat : Always found near water, usually settling on rocks in mid-stream or on twigs overhanging water.

Breeding : Breeds in both still and running water.

Distribution : Throughout India.



38. ***Trithemis pallidinervis*** Kirby

Diagnosis : Thorax with black angular marking as in previous species; in both sexes, eyes reddish brown above, brown laterally and bluish grey below; legs very long and spidery; pterostigma bicolorous; body yellow marked with black; in male, frons and vesicle metallic purple; wings hyaline, with reddish reticulation, and a bright amber-yellow basal marking at extreme base in fore-wing which extends distally to first antenodal nervure and slightly over cubital nervure in hind-wing; in female, frons with upper surface ochreous, broadly marked at basal half with metallic or bronzed golden-green; vesicle bright yellow; wings similar to male, but often tinted with yellow or reddish-brown, especially towards apical half.

Size : Male – abdomen, 28 to 32 mm; hind wing, 30 to 36 mm. Female – abdomen, 26 to 28 mm; hind wing, 30 to 32 mm.

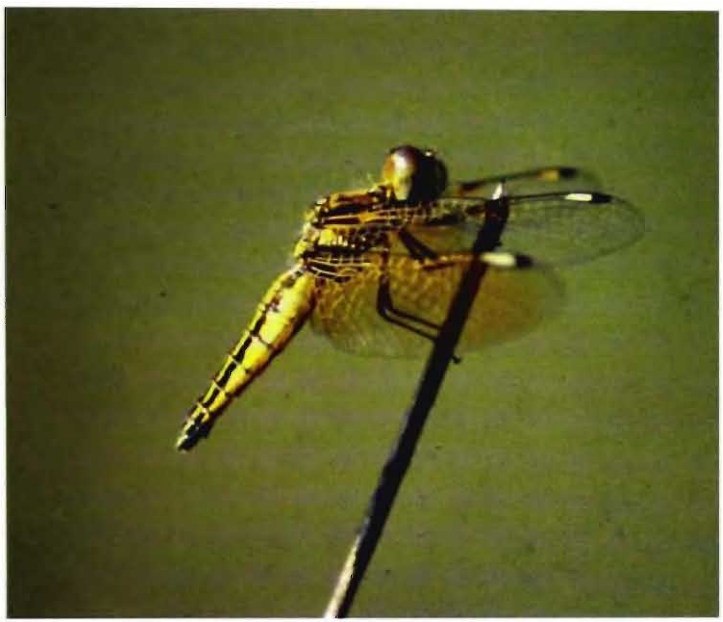
Habits and Habitat : The adult is generally found perching on the top of tall reeds, elevating itself by its long spidery legs, bunched together like a stalk.

Breeding : Breeds in stagnant water and in marshy areas.

Distribution : Throughout India.

39. ***Palpopleura sexmaculata sexmaculata*** (Fabricius)

Diagnosis : In male, frons brilliant metallic blue; wings hyaline marked with black; hind wings usually tinted with yellow from base to proximal end of pterostigma; a black spot at node in fore wing covering from ½ to 1 ½ cells proximal to node; a black streak in sub costal space extending from base for two-thirds its length to node and overlapping costal space for a few cells near its middle, another streak between sectors of arc occupying from 2 to 5 cells, a third stripe in cubital space extending from base nearly to or right up to discoidal cell; similar streaks in the hind wing, but the sub costal stripe not extending in to costal space, the intersector stripe absent; in female, frons non-metallic; wings more broadly marked with blackish brown and black and more deeply tinted with amber yellow.



Size : Male – abdomen, 14 to 16 mm; hind wing, 15 to 21 mm. Female – abdomen, 13 to 14 mm; hind wing, 18 to 21 mm.

Habits and Habitat : Adults are seen away from water, moving into vegetation soon after the emergence.

Breeding : Breeds in rocky streams and marshy pools.

Distribution : Throughout India.

40. ***Rhyothemis variegata variegata*** (Linnaeus)

Diagnosis : Body very dark metallic; frons metallic above; eyes dark reddish brown above; wings widely different in the sexes; wings marked with black and amber-yellow; male with whole of wings tinted yellow, fore wings with spots at node, discoidal cell, apex and at middle of Riii; hind wings with similar dark spots and two broad longitudinal basal bands; female with broader, shorter wings; fore wings hyaline from node to apex, basal half with broad black markings, hind wings with broad irregular markings to as far distal as pterostigma, apex hyaline.

Size : Male – abdomen, 23 to 25 mm; hind wing, 33 to 36 mm. Female – abdomen, 20 to 22 mm; hind wing, 28 to 37 mm.

Habits and Habitat : A local insect of the plains, found around weedy tanks; weak in flight.

Breeding : Breeds in large numbers during September and April.

Distribution : Throughout India.

41. ***Pantala flavescens*** (Fabricius)

Diagnosis : Discoidal cell in fore-wing very narrow, its costal side only about one-fourth to one- third the length of basal; membrane moderately large and white; in male, eyes reddish brown above, lilaceous or bluish laterally; wings hyaline, with base of hind-wing pale golden yellow as far distal as anal loop and with a narrow apical brown spot limited to the posterior border of wing; in female, eyes olivaceous brown above; wings often evenly and more or less deeply enfumed and always without the apical brown spot.

Size : Male – abdomen, 29 to 35 mm; hind wing, 38 to 40 mm. Female – abdomen, 30 to 33 mm; hind wing, 39 to 41 mm.

Habits and Habitat : A very common dragonfly of the plains and submontane regions, showing migratory habits. Large Migratory swarms can be observed during October and November.

Breeding : Breeding takes place in weedy, marshy and shallow water.

Distribution : Cosmopolitan species.

42. ***Tramea limbata similata*** (Rambur)

Diagnosis : Eyes dark brown above, olivaceous laterally and below; genital hamules very long, projecting, and conspicuous in profile; hind wings very broad at base and rather tapered at apex; cells at base of hind wing becoming arranged into straight rows of closely packed narrow cells; pterostigma smaller in hind wing than in fore wing; apical angle of anal loop much more acute than the distal; hamule much longer and greatly overlapping lobe; only a single black spot of variable size at base of hind wing; black spot in hind wing confined to base, very narrow, not invading base of anal loop; nervures in this area reddish; abdomen blood red, marked with black on last three segments; female exactly similar to male; black markings of abdomen often more extensive.

Size : Male – abdomen, 33 to 35.5 mm; hind wing, 44 to 46 mm. Female – abdomen, 32 mm; hind wing, 43 to 46 mm.

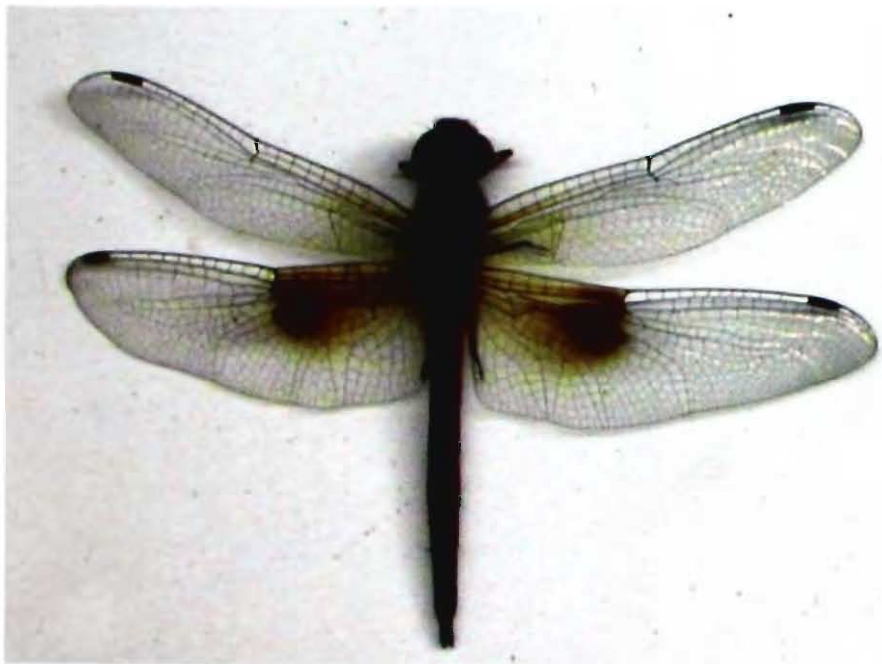
Habits and Habitat : Common on the plains and submontane regions.

Breeding : Breeds in temporary pools and ponds.

Distribution : South India, Eastern India and Sri Lanka.

43. ***Tholymis tillarga*** (Fabricius)

Diagnosis : Eyes brown capped with reddish, olivaceous below; borders of anal loop running on to meet posterior border of wing, apex of loop open; abdomen broad at base, then tapering gradually to the end; wings of male hyaline, with a broad fan-shaped, smoky, golden-brown fascia extending from node to base of hind wing, this fascia bordered distally by a broad oval opalescent white spot about 4 cells deep; female exactly similar to male; wings without any opalescent spot and the golden brown fascia very pale and obscure.



Size : Male – abdomen, 28 to 33 mm; hind wing, 33 to 37 mm. Female – abdomen, 27 to 31 mm; hind wing, 31 to 37 mm.

Habits and Habitat : Crepuscular in habit, appearing shortly before dusk and attracted by light coming often to houses; found in the plains and lower montane regions.

Breeding : Breeds in marshes and weeded water, the larvae are sluggish and bottom dwellers, completing development in 2 to 3 months.

Distribution : Throughout India.

44. *Zyxomma petiolatum* Rambur

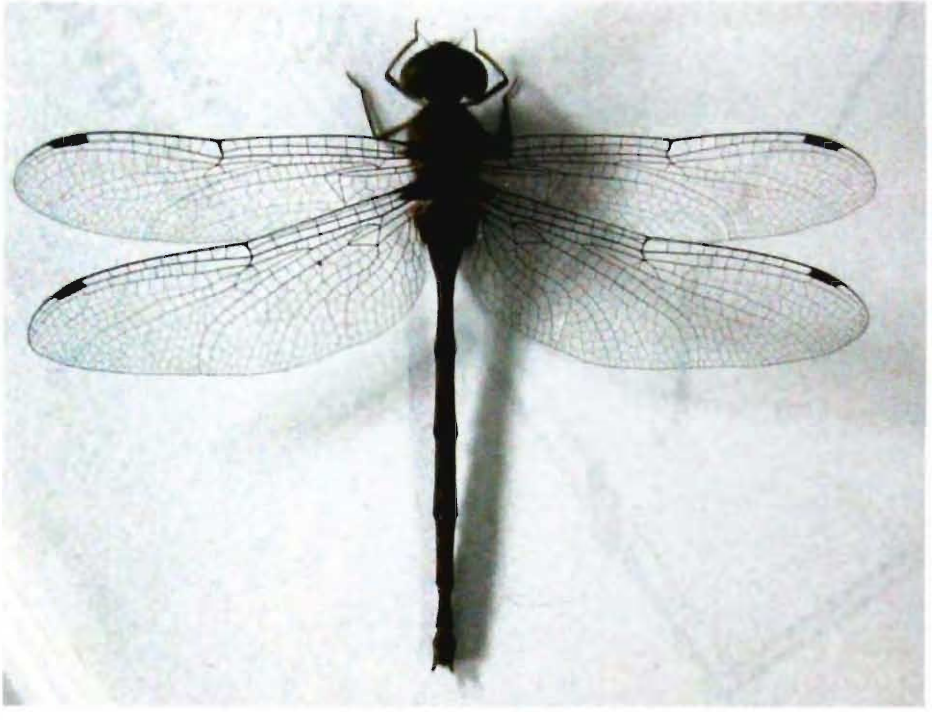
Diagnosis : Eyes brilliant emerald green during life; borders of anal loop running on to meet posterior border of wing, apex of loop open; abdomen very tumid at base (relatively enormously dilated at segments 1 to base of 3, then abruptly contracted and very slim and cylindrical to the end); wings hyaline, but in full adult age, becoming more or less deeply enfumed with brown and apices dark brown; female exactly similar to the male; wings usually more broadly dark reddish brown at apices.

Size : Male – abdomen, 37 to 42 mm; hind wing, 32 to 35 mm. Female – abdomen, 37 to 42 mm; hind wing, 32 to 38 mm.

Habits and Habitat : Crepuscular in habit, appearing shortly before dusk and flying till dark; often coming to houses, attracted by light.

Breeding : Breeds in small stagnant ponds, tanks and wells; during daytime flies round and round close over the water.

Distribution : Throughout India.



45. ***Aethriamanta brevipennis*** (Rambur)

Diagnosis : Eyes dark reddish brown above; subtrigone in fore wing a single cell; hind wing with a conspicuous black and golden yellow basal marking; neuration black; abdomen in male short and depressed, broadly fusiform and brilliant vermilion-red throughout; thorax dark chocolate brown on dorsum; wings hyaline, tinted with deep golden-amber at base, extending slightly beyond the first antenodal nervure in fore wing and as a broad fascia extending from costa to posterior border of hind wing; dark black opaque rays in costal, subcostal and cubital spaces, and a large spot in anal area, the nervures therein bright yellow; pterostigma blackish brown; wings of female similar to male, but opaque black basal spot usually small; pterostigma grayish white; thorax golden-olivaceous on dorsum; abdomen nearly cylindrical, golden olivaceous.

Size : Male – abdomen, 17 to 20 mm; hind wing, 23 to 26 mm. Female – abdomen, 16 mm; hind wing, 23 mm.

Habits and Habitat : A wary restless dragonfly, found near water bodies, keeping well over water and difficult to capture.

Breeding : Breeds in small weedy tanks surrounded by jungle.

Distribution : Bihar, West Bengal, Western Ghats and Kerala.

46. *Urothemis signata signata* (Rambur)

Diagnosis : subtrigone in fore wing 3 celled; in male, eyes blood red above, reddish brown laterally; wings hyaline with crimson reticulation; extreme base of fore wing golden-amber; a broad dark amber-coloured spot at base of hind-wing, in this spot, and framed by it, a blackish brown spot, the network of neuration over it bright ochreous or crimson; thorax red on dorsum, olivaceous with a reddish suffusion laterally; abdomen blood red, black dorsal markings on abdominal segments 8 and 9 only; in female, eyes brown above; thorax ochreous or golden brown on dorsum, olivaceous-green laterally; apices of wings often tipped narrowly with brown; usually the blackish brown spot in anal area well separated from that in the cubital space, so that there are three distinct dark areas instead of two at base of hind wing; abdomen greenish-olivaceous on dorsum, black markings as in male.

Size : Male – abdomen, 27 to 28 mm; hind wing, 34 to 37 mm. Female – abdomen, 25 to 27 mm; hind wing, 34 to 36 mm.

Habits and Habitat : A common dragonfly found in the plains, also extending to lower montane regions.

Breeding : Breeds in weedy tanks and slow running streams.

Distribution : Throughout Peninsular India.

APPENDIX I

Systematic list of Odonata known from Kerala

Order ODONATA

Suborder ZYGOPTERA

Superfamily COENAGRIONOIDEA

Family COENAGRIONIDAE

Subfamily PSEUDAGRIONINAE

1. *Archibasis oscillans* (Selys)
2. *Ceriagrion cerinorubellum* (Brauer) *
3. *Ceriagrion coromandelianum* (Fabricius) *
4. *Ceriagrion olivaceum* Laidlaw
5. *Ceriagrion rubiae* Laidlaw
6. *Pseudagrion decorum* (Rambur)
7. *Pseudagrion indicum* Fraser
8. *Pseudagrion malabaricum* Fraser
9. *Pseudagrion microcephalum* (Rambur) *
10. *Pseudagrion rubriceps rubriceps* (Selys) *

Subfamily COENAGRIONINAE

11. *Cercion calamorum dyeri* (Fraser)

Subfamily ISCHNURINAE

12. *Aciagrion hisopa hisopa* (Selys)
13. *Aciagrion occidentale* Laidlaw *
14. *Ischnura aurora aurora* (Brauer) *
15. *Ischnura senegalensis* (Rambur)

Subfamily AGRIOCNEMIDINAE

16. *Agriocnemis keralensis* Peters
17. *Agriocnemis pieris* Laidlaw
18. *Agriocnemis pygmaea* (Rambur) *
19. *Agriocnemis splendidissima* Laidlaw
20. *Mortonagrion varralli* Fraser

Subfamily ARGIINAE

21. *Onychargia atrocyana* Selys

Family PLATYCNEMIDIDAE

Subfamily PLATYCNEMIDINAE

22. *Copera marginipes* (Rambur) *
23. *Copera vittata* Laidlaw *

Family PLATYSTICTIDAE

Subfamily PLATYSTICTINAE

24. *Platysticta deccanensis* Laidlaw
25. *Protosticta antelopoides* Fraser
26. *Protosticta davenporti* Fraser
27. *Protosticta gravelyi* Laidlaw

28. *Protosticta hearseyi* Fraser
29. *Protosticta mortoni* Fraser
30. *Protosticta sanguinostigma* Fraser

Family PROTONEURIDAE

Subfamily CACONEURINAE

31. *Caconeura ramburi* (Fraser)
32. *Caconeura risi* (Fraser)
33. *Esme cyaneovittata* Fraser
34. *Esme mudiensis* Fraser
35. *Melanoneura bilineata* Fraser
36. *Phylloneura westermanni* (Selys)

Subfamily DISPARONEURINAE

37. *Elattoneura souteri* (Fraser)
38. *Elattoneura tetrica* (Laidlaw)
39. *Prodasineura verticalis annandalei* (Fraser)

Superfamily LESTOIDEA

Family LESTIDAE

Subfamily LESTINAE

40. *Lestes elatus* Hagen
41. *Lestes malabarica* Fraser
42. *Lestes praemorsus praemorsus* (Selys)

Subfamily SYMPECMATINAE

43. *Indolestes davenporti* (Fraser)

Superfamily CALOPTERYGOIDEA

Family CALOPTERYGIDAE

Subfamily CALOPTERYGINAE

44. *Neurobasis chinensis chinensis* (Linnaeus) *
45. *Vestalis apicalis apicalis* Selys *
46. *Vestalis gracilis gracilis* (Rambur) *
47. *Vestalis gracilis montana* Fraser *

Family CHLOROCYPHIDAE

48. *Rhinocypha (Heliocypha) bisignata* (Selys) *
49. *Calocypha laidlawi* (Fraser)
50. *Libellago lineata indica* (Fraser) *

Family EUPHAEIDAE

51. *Dysphaea ethela* Fraser
52. *Euphaea cardinalis* (Fraser)
53. *Euphaea dispar* (Rambur)
54. *Euphaea fraseri* (Laidlaw) *

Suborder ANISOPTERA

Superfamily AESHNOIDEA

Family GOMPHIDAE

Subfamily GOMPHINAE

55. *Burmagomphus pyramidalis* Laidlaw
56. *Heliogomphus promelas* (Selys)

57. *Macrogomphus wynaadicus* Fraser
58. *Merogomphus longistigma longistigma* (Fraser)
59. *Merogomphus longistigma tamaracherriensis* Fraser
60. *Microgomphus souteri* Fraser

Subfamily ONYCHOGOMPHINAE

61. *Acrogomphus fraseri* Laidlaw
62. *Davidioides martini* Fraser
63. *Megalogomphus hannyngtoni* (Fraser)
64. *Megalogomphus superbus* Fraser
65. *Onychogomphus acinaces* (Laidlaw)
66. *Onychogomphus malabarensis* (Fraser)
67. *Onychogomphus nilgiriensis nilgiriensis* (Fraser)
68. *Paragomphus lineatus* (Selys)

Subfamily GOMPHIDINAE

69. *Gomphidia kodaguensis* Fraser

Subfamily LINDENIINAE

70. *Ictinogomphus rapax* (Rambur) *

Subfamily AESHNINAE

71. *Anaciaeschna jaspidea* (Burmeister)
72. *Anax guttatus* (Burmeister)
73. *Anax immaculifrons* Rambur
74. *Gynacantha dravida* Lieftinck
75. *Hemianax ephippiger* (Burmeister)

Superfamily CORDULEGASTEROIDEA

Family CORDULEGASTERIDAE

Subfamily CHLOROGOMPHINAE

76. *Chlorogomphus campioni* (Fraser)
77. *Chlorogomphus xanthoptera* (Fraser)

Superfamily LIBELLULOIDEA

Family CORDULIIDAE

Subfamily CORDULIINAE

78. *Hemicordulia asiatica* Selys

Subfamily IDIONYCHINAE

79. *Idionyx burliyarensis* Fraser
80. *Idionyx minima* Fraser
81. *Idionyx saffronata* Fraser
82. *Idionyx travencorensis* Fraser
83. *Idionyx rhinoceroides* Fraser
84. *Macromidia donaldi* (Fraser)

Subfamily MACROMIINAE

85. *Epophthalmia frontalis binocellata* (Fraser)
86. *Epophthalmia vittata* Burmeister
87. *Macromia annaimalaiensis* Fraser
88. *Macromia flavocolorata* Fraser

89. *Macromia indica* Fraser
90. *Macromia irata* Fraser

Family LIBELLULIDAE

Subfamily TETRATHEMISTINAE

91. *Tetrathemis platyptera* Selys *
92. *Hylaeothemis fruhstorferi* (Karsch)

Subfamily BRACHYDIPLACTINAE

93. *Brachydiplax chalybea chalybea* Brauer
94. *Brachydiplax sobrina* (Rambur) *

Subfamily LIBELLULINAE

95. *Cratilla lineata* (Brauer) *
96. *Epithemis mariae* Laidlaw
97. *Lathrecista asiatica asiatica* (Fabricius) *
98. *Orthetrum chrysis* (Selys) *
99. *Orthetrum glaucum* (Brauer)
100. *Orthetrum luzonicum* (Brauer) *
101. *Orthetrum pruinosum neglectum* (Rambur) *
102. *Orthetrum sabina sabina* (Drury) *
103. *Orthetrum taeniolatum* (Schneider)
104. *Orthetrum triangulare triangulare* (Selys)
105. *Potamarcha congener* (Rambur) *

Subfamily SYMPETRINAE

106. *Acisoma panorpoides panorpoides* Rambur *
107. *Brachythemis contaminata* (Fabricius) *
108. *Bradinopyga geminata* (Rambur) *
109. *Crocothemis servilia servilia* (Drury) *
110. *Diplacodes trivialis* (Rambur) *
111. *Diplacodes nebulosa* (Fabricius)
112. *Indothemis carnatica* (Fabricius)
113. *Neurothemis fulvia* (Drury) *
114. *Neurothemis intermedia intermedia* (Rambur) *
115. *Neurothemis intermedia atlanta* Ris
116. *Neurothemis tullia tullia* (Drury) *
117. *Rhodothemis rufa* (Rambur) *
118. *Sympetrum fonscolombi* (Selys)

Subfamily TRITHEMISTINAE

119. *Trithemis aurora* (Burmeister) *
120. *Trithemis festiva* (Rambur) *
121. *Trithemis kirbyi kirbyi* Selys
122. *Trithemis pallidinervis* (Kirby) *

Subfamily ONYCHOTHEMISTINAE

123. *Onycothemis testacea ceylanica* Ris

Subfamily PALPOPLEURINAE

124. *Palpopleura sexmaculata sexmaculata* (Fabricius) *

SubfamilyTRAMEINAE

125. *Rhyothemis variegata variegata* (Linnaeus) *
126. *Rhyothemis triangularis* Kirby
127. *Hydrobasileus croceus* (Brauer)
128. *Pantala flavescens* (Fabricius) *
129. *Tramea basilaris burmeisteri* Kirby
130. *Tramea limbata similata* (Rambur) *
131. *Tholymis tillarga* (Fabricius) *
132. *Zyxomma petiolatum* Rambur *

Subfamily UROTHEMISTINAE

133. *Aethriamanta brevipennis* (Rambur) *
134. *Macrodiplax cora* (Brauer)
135. *Urothemis signata signata* (Rambur) *

Subfamily ZYGONYCHINAE

136. *Zygonyx malabricus* Fraser
137. *Zygonyx metallicus* Fraser

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* Common odonates of Kerala dealt with, in the book.

REFERENCES & FURTHER READING

Corbet, P.S. 1983. *A biology of dragonflies.* E.W. Classey Limited. Fringdon. i–xvi; 1-247.

Emiliyamma, K.G. and C. Radhakrishnan. 2000. Odonata (Insecta) of Parambikulam Wildlife Sanctuary, Kerala, India. *Rec. zool. Surv. India.* **98** (1) : 157-167.

Emiliyamma, K.G. and C. Radhakrishnan. 2002. Additions to the Odonata (Insecta) of Thiruvananthapuram district, Kerala. *Zoos' print Journal.* **17** (10) : 914-917.

Fraser, F.C. 1924. A survey of the odonate (Dragonfly) fauna of Western India with special remarks on the genera *Macromia* and *Idionyx* and descriptions of 30 new species with appendices I & II. *Records of the Indian Museum.* **26** : 423-522.

Fraser, F.C. 1932. Additions to the survey of odonate fauna of western India, with descriptions of nine new species. *Records of the Indian Museum.* **32** : 443–474.

Fraser, F.C. 1933, 1934 & 1936. *The Fauna of British India including Ceylon and Burma.* (Odonata). **1** : xiii + 1-418; **2** : xix + 1-398; **3** : xi + 1-461.

Gunther Peters. 1981. Trockenzeit–Libellen aus dem indischen Tiefland. *Dtsch. Ent. Z., N.F.* 28. Heft I–III, seite 93-108.

Jafer Palot, M., Dinesan Cheruvat, Emiliyamma, K.G. and C. Radhakrishnan. 2002. Dragonfly Menace at the National Fish Seed Farm, Malampuzha, Kerala *Fishing chimes,* **22** (5) : 56 & 60.

Jill Silsby. 2001. *Dragonflies of the World.* The Natural History Museum, London, : 1-216.

Lahiri, A. R. 1987. Studies on the odonate fauna of Meghalaya. *Rec. zool. Surv. India. Occ. Paper* No. **99** : 1-402.

Mathavan, S. and P.L. Miller. 1989. A collection of dragonflies (Odonata) made in the Periyar National Park, Kerala, South India, in January 1988. *Soc. Int. Odonatol. Rapid Comm. (suppl.),* No. **10** : 1-10.

Mitra, T.R. 2002. Geographical distribution of Odonata (Insecta) of Eastern India. Memoirs of the Zoological Survey of India. Vol. **19** (1) : 1-208.

Mitra, T.R, 2003. Ecology and biogeography of Odonata with special reference to Indian fauna. *Rec. zool. Surv. India, Occ. Paper* No. **202** : 1-41.

Prasad, M. and R.K. Varshney. 1995. A checklist of the Odonata of India including data on larval studies. *Oriental Insects,* **29** : 385-428.

Radhakrishnan, C. 1997. Ecology and conservation status of Entomofauna of Malabar. *Zoos Print,* **11** : 2-5.

Radhakrishnan, C. and K.G. Emiliyamma. 2003. Odonata (Insecta) of Kerala : A systematic database. In : *Advancements in Insect Biodiversity,* Ed. Rajiv K. Gupta. *Agrobios*, Jodhpur.

Ramachandra Rao, K. and A.R. Lahiri. 1982. First records of Odonates (Arthropoda: Insecta) from the Silent Valley and New Amarambalam Reserved Forests. *J. Bombay nat. Hist. Soc.,* **79** (3) : 557-562.

Terrence de Fonseka. 2000. *The Dragonflies of Sri Lanka.* WHT Publications (Private) Limited, Sri Lanka. 1-303.