INTRODUCTION

Dragonflies constitute the order Odonata. It is relatively a small order of insects and is being represented by three suborders *viz.*, Zygoptera, Anisozygoptera and Anisoptera. These suborders are further divided into twenty seven families encompassing about seven thousand (7000) species and subspecies. These are cosmopolitan in distribution and are abundant in the tropics especially available in the vicinity of aquatic bodies.

These insects are noteworthy for their cute appearance, flight-power and sharp eye sight. These 'flying machine' can fly backward, move vertically like helicopter or stop and turn in the midst of the most rapid progression as if they have been rammed into. This could be possible due to the adjustment of the centre of gravity between the bases of the wings and leaves a sharp contrast with all other living insects.

Dragonflies have the highest development of the compound eyes (Huxley 1953). It has been estimated that an eye of an adult dragonfly may contain 10,000 to 28,000 facets. The eyes occupy almost whole of the head. Other parts of head *viz.*, labium, labrum, clypeus, frons, occiput etc. are very small. The head is movable and can be twisted sideways 180°, backward 70°, forward and downward 40°. With these attributes, dragon–flies can select their habitat according to their choice (Corbet 1962).

These insects are primitive and possess some specialised features too. Their ancestors have been recorded from the carboniferous rocks; but no remarkable changes in the morphology have taken place after Jurassic. The meso-and metathorax are fused to form the synthorax (thorax) and the legs have been shifted forward and form a basket with the help of spines. Such features enable them to capture prey while on wing. The wings are membranous in nature and endowed with net of veins. The abdomen is relatively long and slender the genitalia is found to be at its tip. In case of male only, however, the second abdominal segment bears the copulatory organ. Mating behaviour is somewhat interesting and in doing so the male captures the neck of the female with the help of the anal appendages and in response the female amplexes its genitalia with the male copulatory organ, and thus constitute the so called 'Wheel'

Females oviposit in water either being accompanied by the male or may remain alone. The male sometimes guard the ovipositing female. The larvae develop in water and feed on aquatic animals *viz.*, mosquito larvae, beetles, earthworms, rarely fishlings with the aid of their labium. The adults live in air and feed on mosquitoes, flies, aphids, termites and other noxious insects. Fraser (1933c) rightly recorded them *"Economically they are of great importance in destroying noxious flies and mosquitoes, as well as the smaller moths which are regarded as pests. Life in the tropics would soon become unbearable were it not for the beneficient work of vast numbers of dragonflies acting as scavengers of the atmosphere. Some species which take to the wing only after dark or at dusk live entirely on mosquitoes"* Bats, birds, lizards, amphibians spiders and fishes are the natural enemies of these insects.

In India alone there are about five hundred species and subspecies so far known. They are distributed over seventeen families and are grouped under three suborders. Research on Indian Odonata had been initiated by Johannsen in 1768, followed by Fabricius (1775). Rambur (1842), Selys (1853-1900), Laidlaw (1914-1951), Fraser (1918-1936) in British India. Fraser (1933c, 1934b and 1936a) in his Fauna of British India including Ceylon and Burma, reported five hundred thirty seven species and subspecies from the Indian subcontinent. During those days exploration in different parts of India was tough due to lack of communications and other hurdles.

Therefore, practically very limited informations were available on Odonata of different states of eastern India *viz.*, Arunachal Pradesh, Assam, Bihar, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal.

After independence of India, population explosion took place and the development work began. As a result the habitat (forests and swamps) of animals were destroyed due to human interference. Zoological Survey of India undertook exploration of fauna of different parts of India to prepare catalogue of animals of the country and their ecology. As a result huge number of Odonata collections were made and preserved in the laboratories of the Zoological Survey of India. With the available material, Lahiri (1987) published Odonata fauna of Meghalaya, Srivastava and Das (1987) of Orissa, Srivastava and Sinha (1993) of West Bengal and Prasad and Varshney (1988) of Bihar. But less informations were recorded in connection with the detailed geographical distribution and ecology of Odonates of these states. In addition to the above referred collections the present investigator harnessed to collect several specimens in different states in course of further exploration of fauna.

In this treatise attempts have been made to (i) prepare a catalogue of Odonata occurring in the states of Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal; (ii) their variations from the specimens collected from other regions of India and (iii) their detailed geographical distribution. In all a list of 294 species and subspecies occurring in these states has been framed denoting their current taxonomic status; one species described from West Bengal and nine species from other parts of India have been synonymised; incidentally new species of *Calicnemia* Strand and *Gomphidia* selys have been incorporated apart from other 4 indeterminate species.

Detailed geographical distribution of each species has rendered help to analyse the faunal relationship and facilitates the preparation of the list of species which, however, still not available after their first description.

HISTORICAL REVIEW OF ODONATALOGY OF EASTERN INDIA

Survey of literature reveals that Odonatology of India is two hundred thirty two years old (1768-2000) with the record of occurrence of *Rhyothemis variegata* (Linne-Johannsen) by Johansen in 1768 from eastern India (Mitra 1998). Later on Fabricius (1775, 1776, 1793 and 1798), Rambur (1842) and Selys (1853-1900) made substantial contribution to Indian odonatolpgy.

Following the review of the literature periods or development of Odonatology of India may be divided into Fabricius, Selysian, Laidlaw-Fraserian and post independence era. Development of odonatology of eastern India started in the Pre–Selysian era by Johannsen in 1768. Selys-Hagen (1853) described *Echo margarita* from Cherrapunji, Meghalaya. Later on his studies, Selys (1858, 1869, 1874, 1877, 1878, 1883, 1891) added more taxa. He (1877) described *Agriocnemis lacteola* Selys from Bengal. This is, in fact, the first definite record of Odonata from one of the ten states under present consideration. Thereafter, Selys (1891) recorded *Calicnemia pulverulans* Selys, *Aciagrion hisopa hisopa* Selys, *Ischnura aurora aurora* (Brauer), *Agriocnemis pygmaea pygmaea* (Rambur), *Gynacantha bayadera* Selys, *Acisoma panorpoides* Rambur, *Brachydiplax sobrina* (Rambur), *Neurothemis tullia tullia* (Drury), *Aethriamanta brevipennis* (Rambur) *Trithemis aurora* (Burm.), *Crocothemis servilia* (Drury) and *Rhyothemis plutonia* Selys from the regions in question. MacLachlan (1896) reported *Gynacantha khasiaca* MacLachlan from eastern India. After the death of Selys (1900) Laidlaw-Fraserian era ensues.

The seed sowed by Johannsen (1768), Fabricius (1775) and nurtured by Selys (1853-1891) finally developed into a huge tree during the Laidlaw-Fraserian era. Their

works principally constitute the materials for the Fauna of British India, including Ceylon and Burma by Fraser (1933c, 1934b, 1936a). Odonata from the localities in the states under consideration were available in the communications brought about by Laidlaw (1914, 1915a-d, 1916 a&b, 1917a&b, 1919, 1920 a&b, 1922); and Fraser (1918 a&b, 1919a, 1920a-c, 1921a-c, 1922b-c, 1923a&b, 1924c&d, 1925a-c, 1926a-c, 1927a-c, 1928a-c, 1929a-c, 1930, 1931b-d, 1932a&b, 1933b&c, 1934a-c, 1935a-e, 1936a&b, 1940) respectively. During this period Martin (1906, 1908 & 1909a); Ris (1909a, 1910, 1916); Annandale (1921); Needham (1932); St. Quentin (1936&1937) reported/described several taxa from the localities under review. In the mean time Tillyard (1921) discovered the relict dragonfly *Epiophlebia laidlawi* from Darjeeling.

After independence of India (1947), the Post independence era commences. The era was initiated by Raychaudhuri and Dasgupta (1949). During this period the significant contribution is the rediscovery of *Epiophlebia laidlawi* Tillyard from Darjeeling first by Asahina (1958) and later by Svihla (1962). Besides this, taxonomic and faunistic studies were made by a host of workers like Bhasin (1953); Mehrotra (1959); Asahina (1961a, 1962 & 1963); Lahiri and Mitra (1972 & 1976); Mitra and Lahiri (1974, 1975 & 1980); Mitra and Sen (1975), Mitra (1973, 1974a-c, 1977 & 1983); Lahiri (1977 a&b, 1979); Lahiri *et. al.* (1970); Prasad & Ghosh (1984); Prasad and Kumar (1977); Prasad and Varshney (1988), Ram *et. al.* (1982), Raychaudhuri *et. al.* (1969) and Srivastava and Das (1987). Observations on the habits and habitats were initiated by Mitra and Lahiri (1972), Mitra (1974a-c, 1977, 1987, 1990); Prasad (1989a, b & 1990 and 1999); Prasad and Ghosh (1982) and Ram and Prasad (1978).

Studies on the zoogeographical relationship have been made by Asahina (1960), Mitra (1975b) and Mani (1974a, c-f). Cytotaxonomy, however, was opted by Raychaudhuri and Dasgupta (1949), Dasgupta (1957) and Chatterjee and Kiauta (1973).

In view of the destruction of habitat as referred earlier Mitra (1982) reported the status of *Epiophlebia laidlawi* Tillyard in the schedules of Wildlife (Protection) Act, 1972 of the Government of India. He (1990), however, opined that the absence of *Pseudagrion australasiae* Selys, *Lestes platystylus* (Rambur), *Ictinogomphus angulosus* (Selys), *Macrogomphus montanus* Selys, *Epophthalmia vittata vittata* Burmeister and *Macrodiplax cora* (Brauer) in Calcutta following their first collection is due to the impact of urbanisation.

REGIONAL GEOGRAPHY
(Figs. 1-10)

Geology structure, relief and physiography together with the positional factor provide a fairly well defined division of India in four macrounits. 1. The Great Plains 2. The Himalayan Mountain Region, 3. The Peninsular Uplands and 4. The Indian Coasts and Islands. These divisions are distinct from one other and each of these possesses the regional peculiarities (Singh 1971). States, Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal under consideration, lie in the following subdivisions of the aforesaid regional divisions of the country.

(A) The Great Plains

1. ***The Middle Ganga Plain*** : (Fig. 7). It is not a well defined physical unit and includes North Bihar and eastern Uttar Pradesh. It lies between 24° 30'N.-27° 50'N and 81° 47' E-37° 50'E. The eastern and western sides are open and there is no physical boundary between the upper, the middle and the lower Ganga Plain. As a consequence the Middle Ganga Plain forms the central part of the east-west continuum of the vast isotropic Ganga Plain. Due to the absence of physical boundaries, this area experiences drier air currents from the North-West as well as pro-humid climate of the Lower Ganga Plain.

2. ***The Lower Ganga Plain*** : (Fig. 7) It covers the Plains of West Bengal, and includes the delta proper and the Rarh Plain. It lies

within 21°25'N.-26°50'N and 86°31'E-89°58'E. and is prevailed by a hot and monsoon climate. The month of January appears coldest, thereafter from February the temperature starts rising gradually and is well marked 4°-6°C in March and continues till May. There is further rise of temperature at the break of monsoon in the month of June.

Natural vegetation lies in the mangrove and tidal forests in the Sunderbans and humid tropical forests in the extreme North. The tropical ever green forests are concentrated in the Duars. Deciduous and scrub vegetations occur in Midnapore, Bankura and Birbhum districts; scattered and patches are visible in Howrah and Hooghly districts of the delta proper.

3. ***Assam Valley***: (Fig. 6) It is also known as the Brahamaputra valley. This includes the North and the South of the Upper and Lower Valley, and lies within 25° 44'N.-27° 55'N. and 89° 41' E.-96° 02'E. Despite its being the eastern continuum of the Great Plains, this valley is a distinct physical unit within the girdle formed by the eastern Himalayas, Patkoi ranges, Naga Hills, Garo-Khasi-Jaintia and Mikir Hills.

It is apparent that the climatic conditions in Brahamaputra valley exibit a major deviation from other subregions of the Great Plains, since it records a very high rainfall coupled with storm during premonsoon periods, and there is prevalence of fog in the winter months. Accordingly, seasons can be divided into Winter (December-February); Pre-monsoon or Summer (March-May); Monsoon (June-July); Retreating Monsoon (October-November).

Natural vegetation can be classified as: (a) Tropical Evergreen and Semi Evergreen Forests — in the easternmost part of the valley; (b) Sal Forests in the districts of Kamrup and Goalpara and in the westernmost part of the Nowgong district; (c) Riverine Forests - along the river banks from the Sankosh River in the West through Goalpara and Kamrup to the eastern boundary of the district of Darang, in the northern fringe bordering the Kingdom of Bhutan; (d) Mixed Deciduous Forests-occur mostly in the Lower Brahamaputra valley and (e) Savanah type occurs in the well drained lighter areas.

(B) The Himalayan Mountain Region

1. ***The Eastern Himalaya***: (Fig. 4) It lies within 26° 40'N.-29° 30'N and 88° 0'E.-97° 5'E. comprised of the mountainous part of Darjeeling district of West Bengal, Sikkim, Arunachal Pradesh (excluding Tirap and part of Lohit Division) within the jurisdiction of the present investigation. Rapid changes in the topography and altitudes play an important role in changing the climatic conditions within short distances. There is a contrast in temperature and rainfall between the sheltered valleys, foothills and the mountain tops. The premonsoon showers begin towards the end of March, the monsoon proper continues from May to September. Rains during winter are a regular feature. Months of June and July are considered to be the wettest.

It is estimated that the plant communities in the area are composed of nearly 4,000 species of flowering plants and about 350 species of ferns including their allies *viz.*, *Selaginella*, *Lycopodium*, *Equisetum* etc.

2. ***The Purvanchal***: (Fig. 4) The region is encompassed within 21° 57'N.-28° 23'N. and 91° 23'E.-97° 25'E. incorporating Nagaland, Manipur, Mizoram, Tripura and Lohit districts of Arunachal Pradesh, Cachar district along with a part of Haflong of Assam state.

The climate of the Purvanchal reflects characteristic rhythm and as such the year is divisible into four seasons (a) Winter (December-February), (b) Premonsoon or Summer (March-April); (c) Monsoon (May-September), and (d) Retreating Monsoon (October-November). January is the coldest month.

This subregion may still be encountered as the treasure land of natural vegetation-the variation of altitude, climate as well as soil includes the forest types ranging from the Tropical evergreen to Temperate evergreen and conifers.

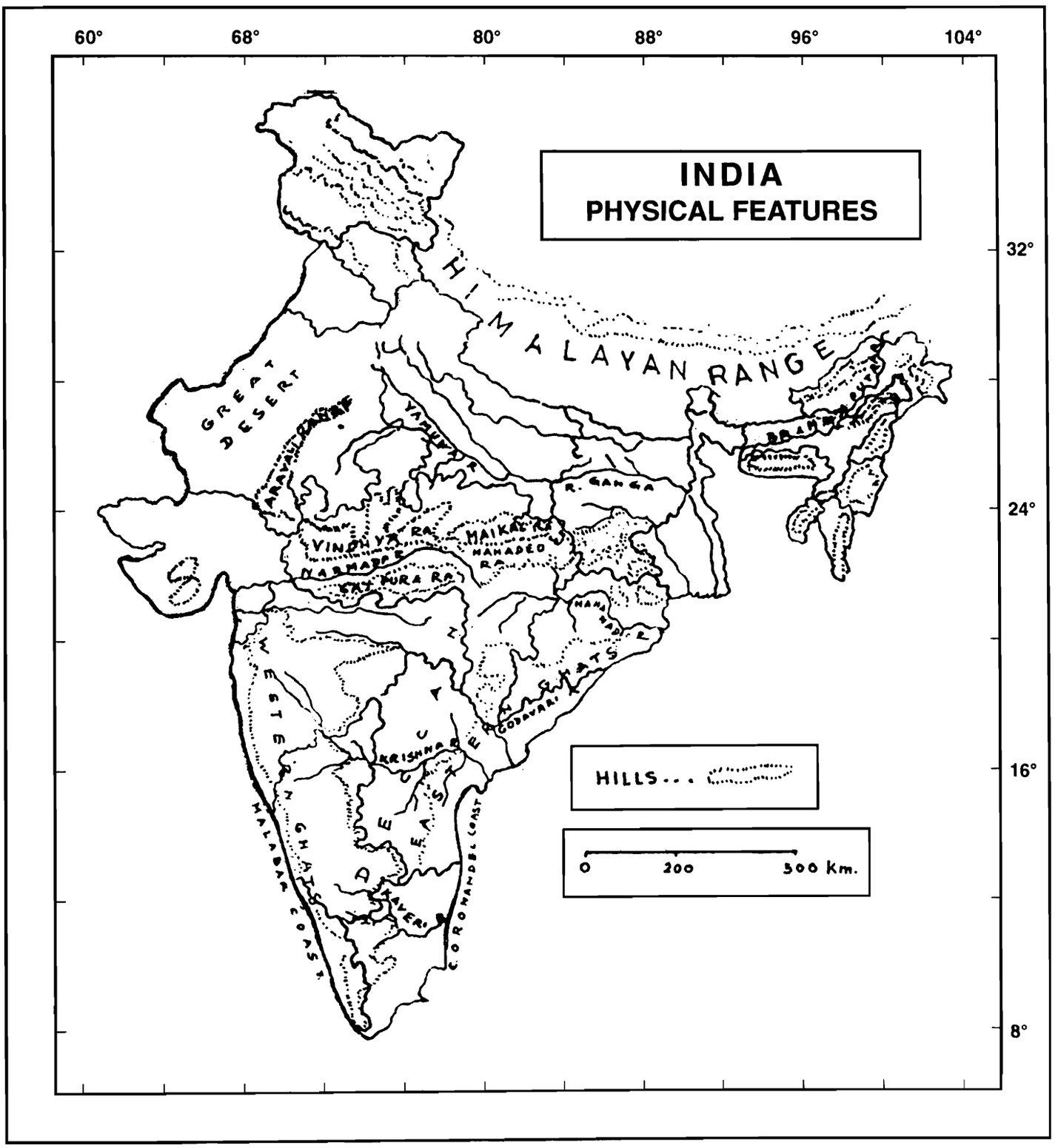

Fig. 1. India : Physical Features

Fig. 2. States of India

N.B. Recently created Uttaranchal, Jharkhand and Chhatisgarh have not been cited here and in the list of distribution (localities)

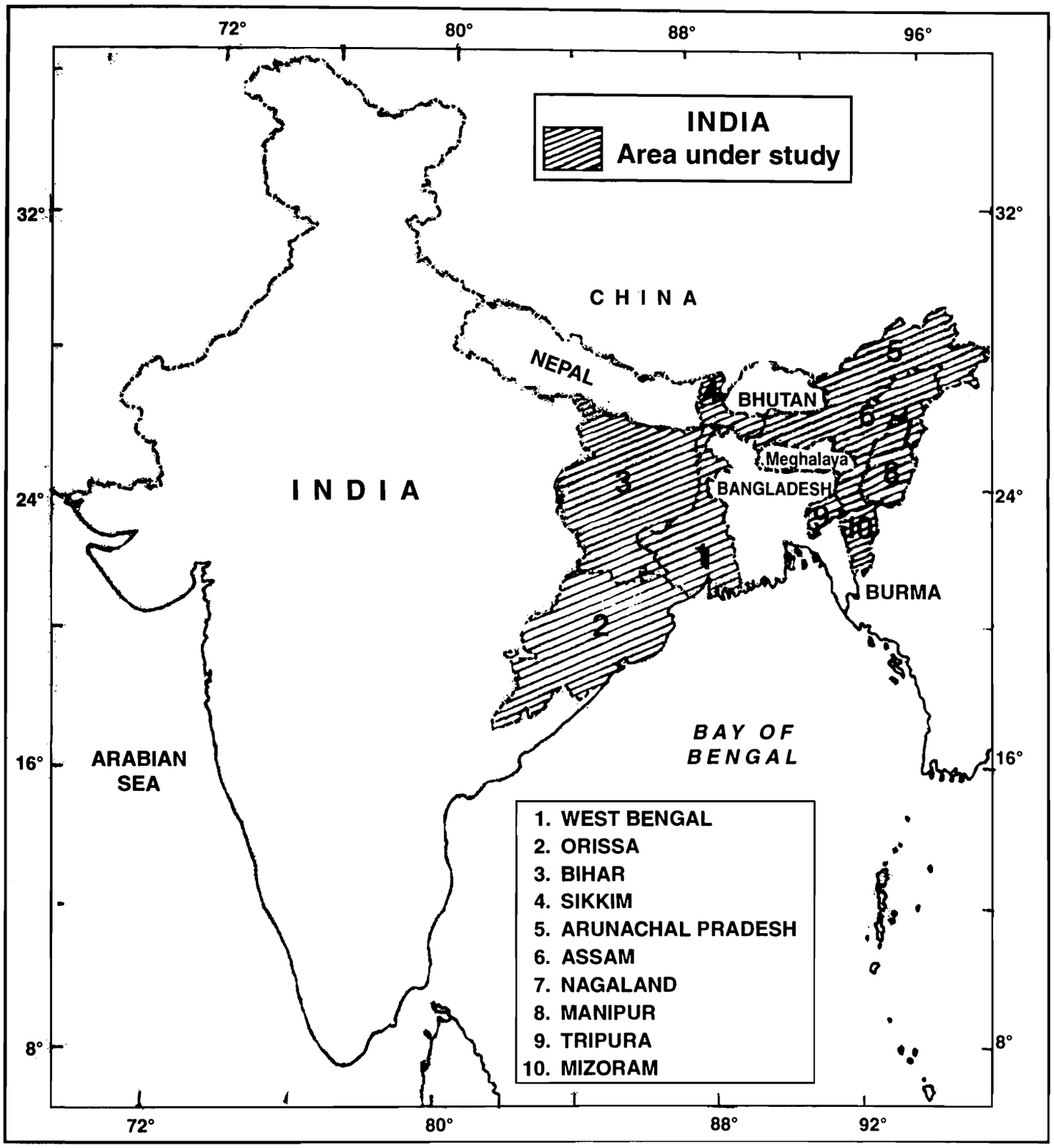

Fig. 3. Area Under Study

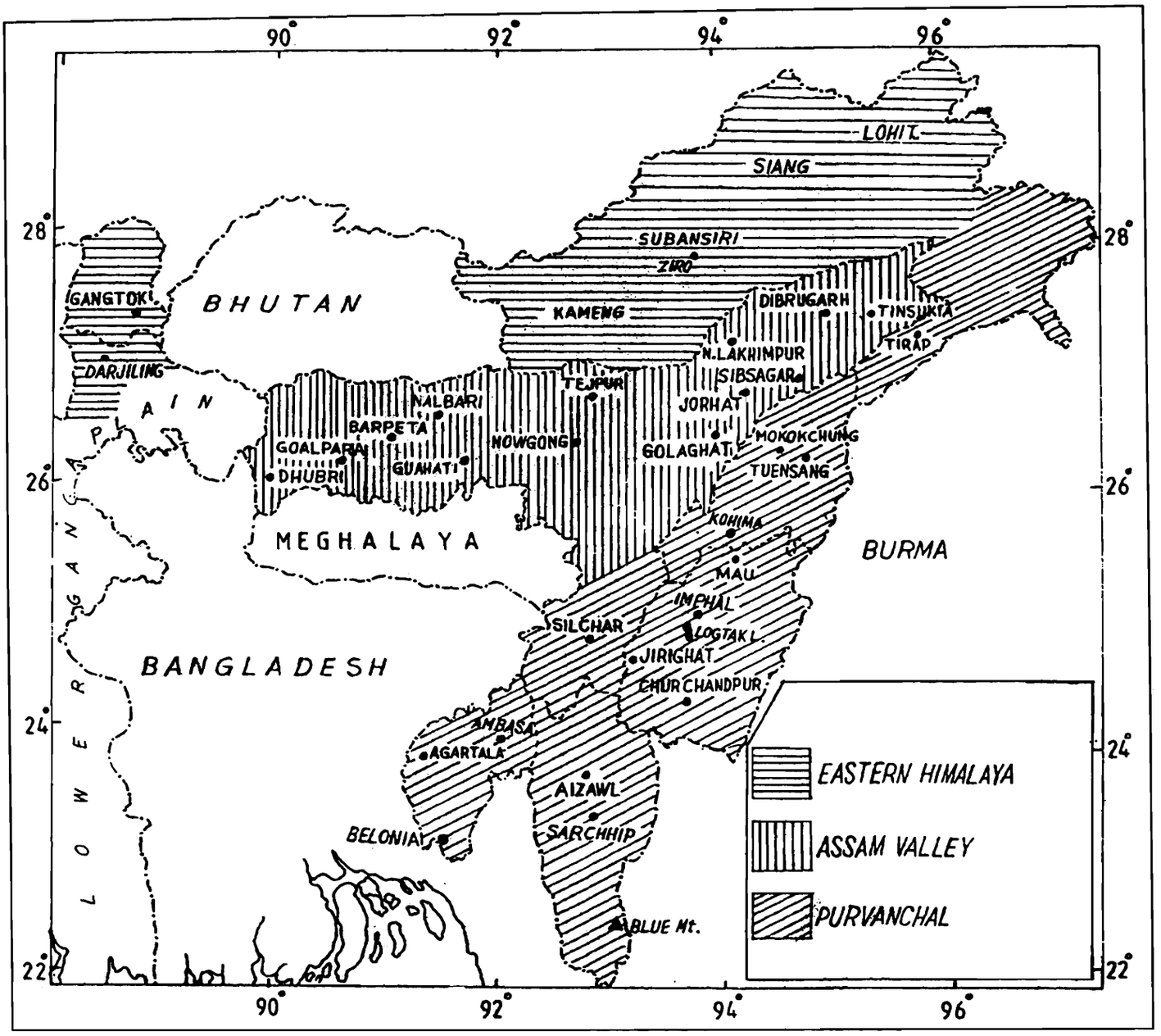

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Fig. 4. Geographical Area of Eastern Himalaya, Assam Valley, Purvanchal.

(C) The Peninsular Uplands

1. ***The Chota Nagpur Region***: (Fig. 7) It has irregular boundaries and the extreme points lie between 20° 0'N.-25° 30'N. and 83° 47'E.-87° 50'E. comprised of the districts of Ranchi, Hazaribagh, Singhbhum, Dhanbad, Palamau, Santhal Paraganas of Bihar and Purulia district of West Bengal.

This subregion experiences a typical monsoon climate having a seasonal rhythm. In March the temperature starts rising sharply until May. But there is some precipitation in April due to the influence of the norwester on West Bengal and during monsoon (June to October) when the temperature begins to decline. The cold season commences from November and lasts till the end of February.

There are three types of forests over the plateau - (a) Dry Deciduous Forest lies on the fringes of Hazaribagh plateau. It comprises a wide variety of stunted deciduous trees. (b) Dry Peninsular Sal Forest is extensively found over the Hazaribagh plateau, the lower Plamau and in the Singhbhum district. (c) Moist Peninsular Forest is located in the Singhbhum district.

2. ***Orissa Highland Region***: (Fig. 8) This region lies within 17° 15'N.-22° 34'N. and 82° 27'E.-86° 25'E. bounded in the North by the Chota Nagpur Plateau, in the West by the Chattisgarh Region and the South-West by the Dandakaranya Region and in the East by the Orissa Coastal Plain and West Bengal.

The tropical monsoon climate of this region is characterised by the high temperature almost throughout the year and medium to high rainfall. The average minimum temperature is around 18°C. rising to 24°C in April and May falling to 20°C in July and about 13.5°C. in January. The mean annual rainfall is about 150 cms. Sudergarh, Mayurbhanj and Keonjhar districts lying in the North receive the maximum rainfall while Ganjam records the lowest.

There are three types of forests (a) Tropical Semi evergreen Forests occur mostly in the Dhenkanal and Ganjam districts. (b) Tropical Moist Deciduous Forests occur in continuation of the semievergreen type. They extend from the southern point to the central belt of Mayurbhanj passing irregularly through Ganjam and Dhenkanal. (c) Tropical Dry Deciduous Forests occur in the northern and western portions of Bolangir and Sambalpur.

(D) Indian Coasts

Utkal Coastal Plains : The Orissa coastal plain includes small portion of Mayurbhanj, major portion of Balasore, parts of Cuttack, Puri and Ganjam districts. In this plain a group of limestones, sand-stones and clays occur in the beds of Burabalong river south of Baripada town of Mayurbhanj district. Pleistocene alluvium occurs at several places along the coastal tract.

Note on locality names : Retention of the original names of the localities/countries referred to in the earlier literature is being followed in order to avoid confusion. Indeed, in many cases the earlier names of different states have undergone changes due to ethno-political reasons and accordingly, Bengal Presidency of the early twentieth century is represented as eastern Indian states and Bangladesh. Assam likewise has been represented by Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram and Nagaland; East Pakistan by Bangladesh; Ceylon by Sri Lanka and Burma by Mynamar. The separate entity of Sikkim, as sovereign country, has now become a part of eastern India. Furthermore, recent changes in the names of some localities or regions have been incorporated since some investigators have referred to these names elsewhere and accordingly a table is being furnished for ready reference. (Recently three states Uttaranchal, Jharkhand and Chhatisgarh have been created from the states viz. Uttar Pradesh, Bihar and Madhya Pradesh).

Fig. 5. Map of Sikkim

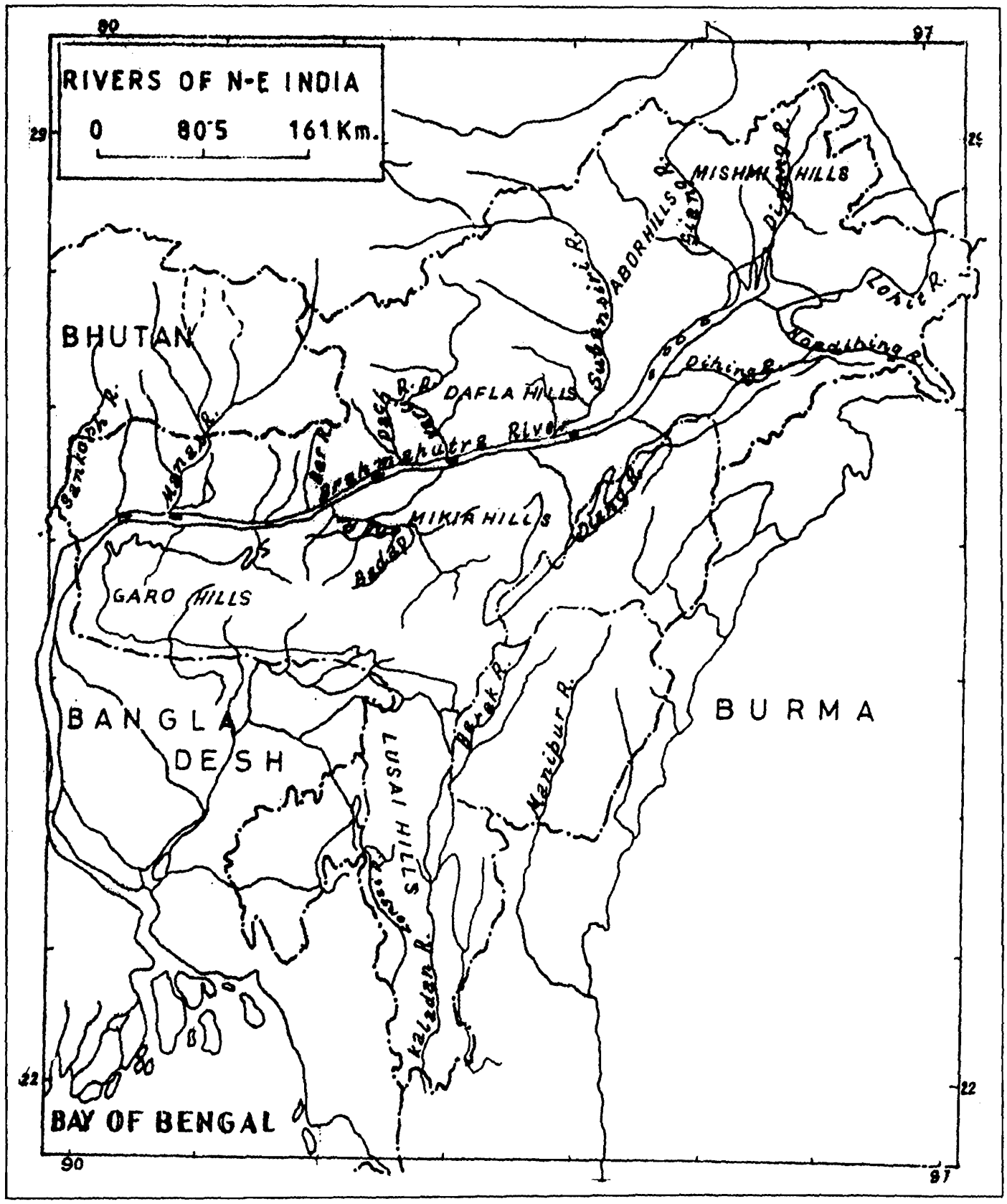


Fig. 6. Rivers of North Eastern India

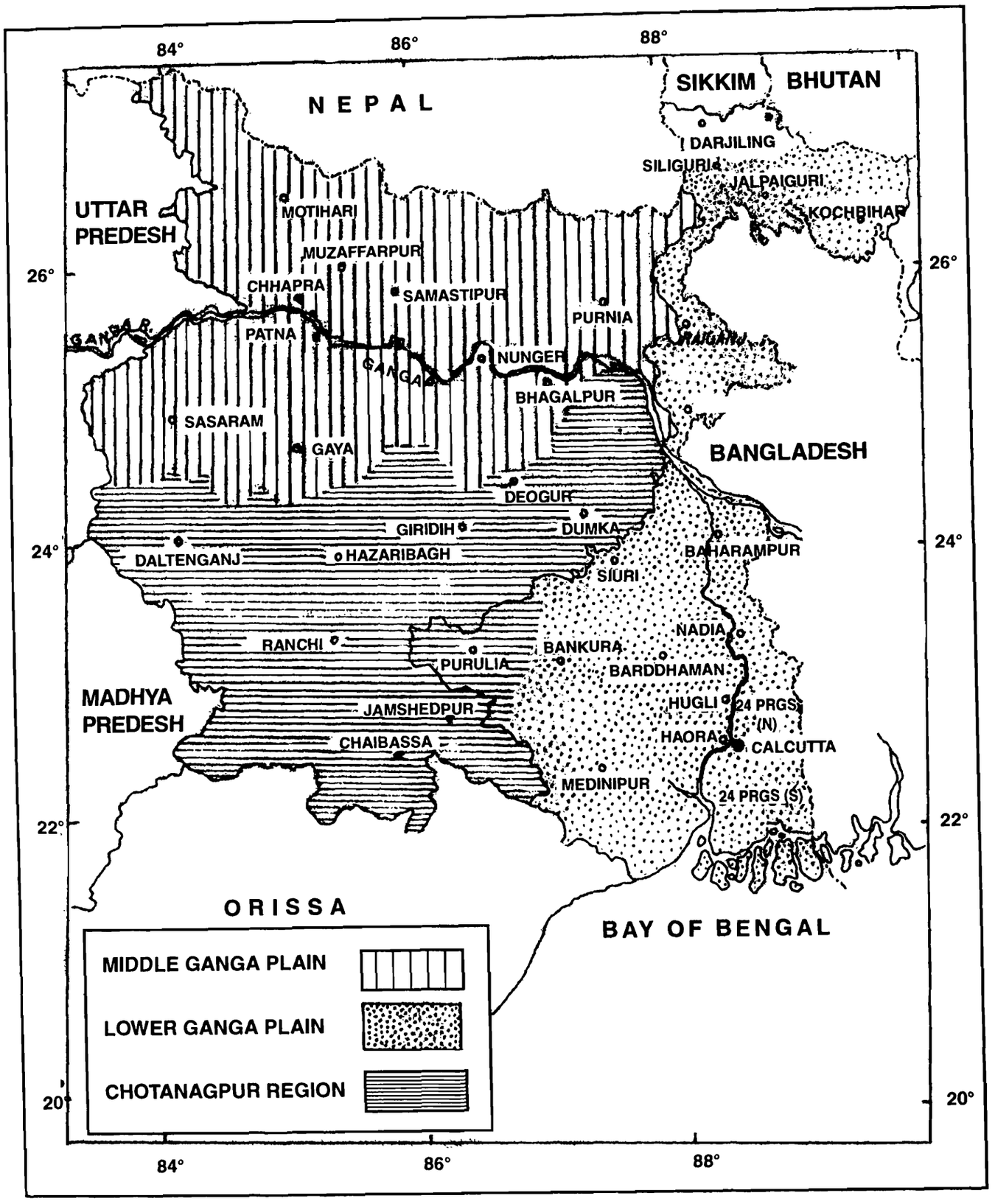


Fig. 7. Geographical area of Middle Ganga Plain, Lower Ganga Plain and Chhotanagpur Region

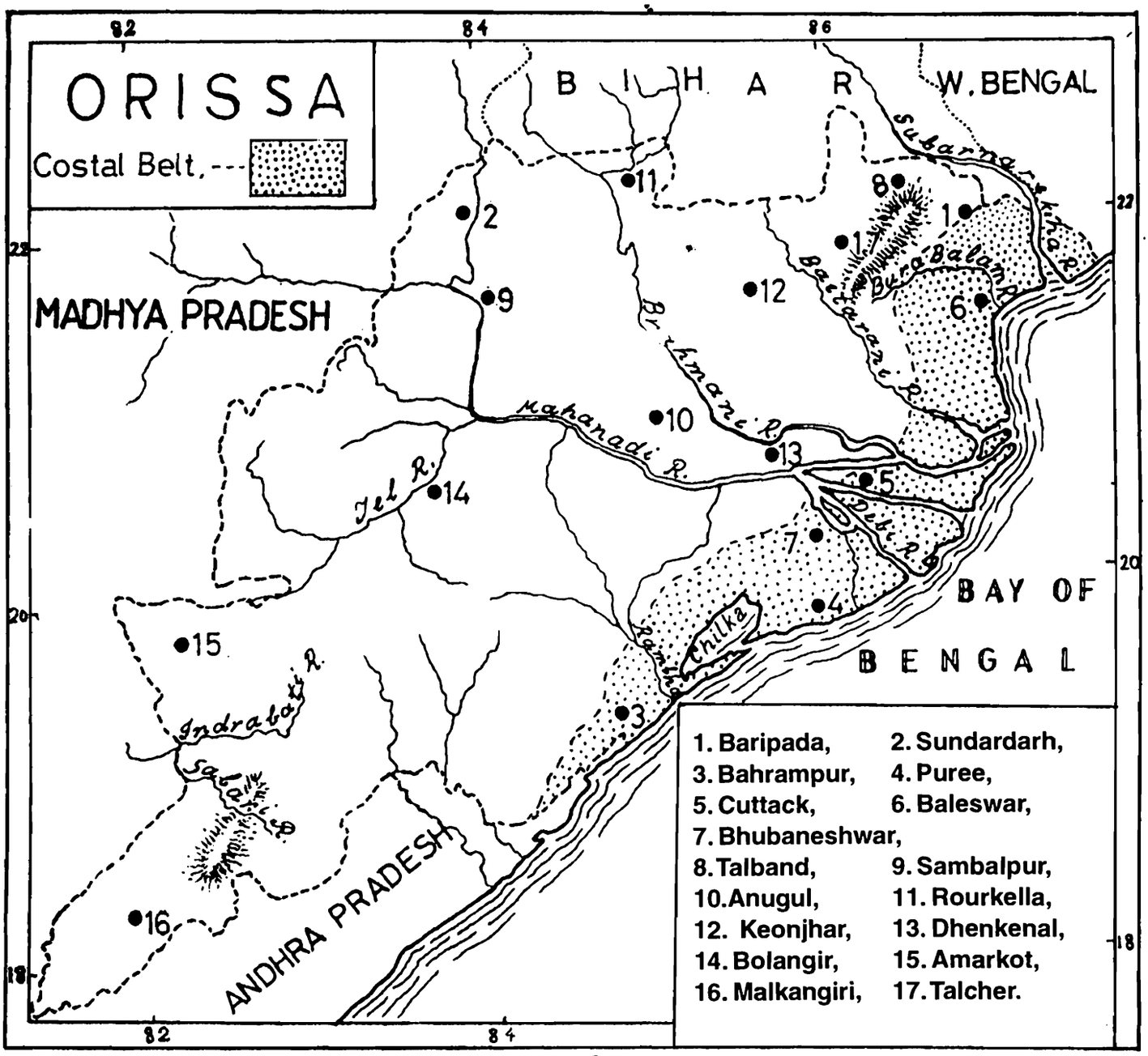


Fig. 8. Geographical area of Orissa Highland.

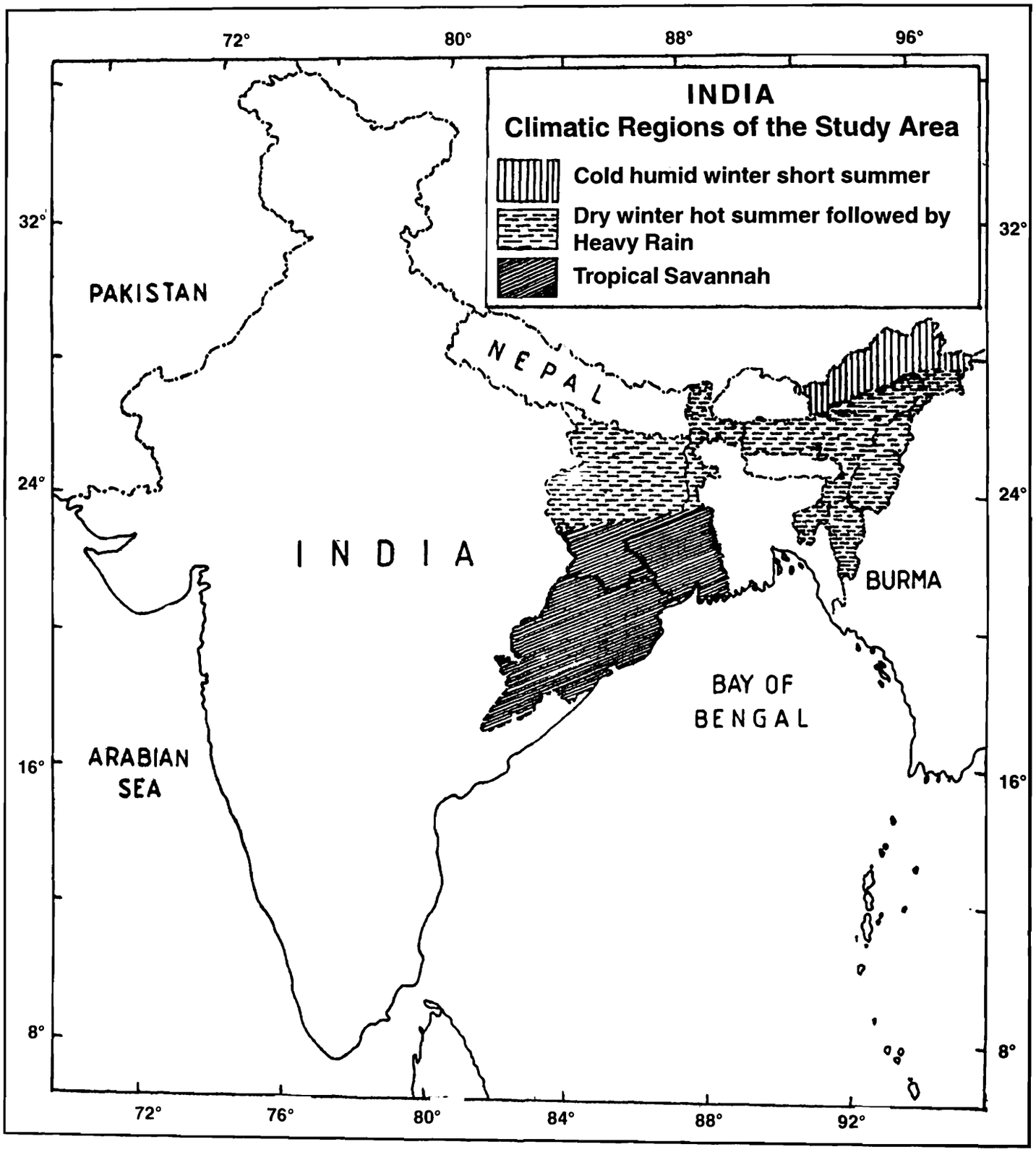


Fig. 9. Climatic regions of the study area

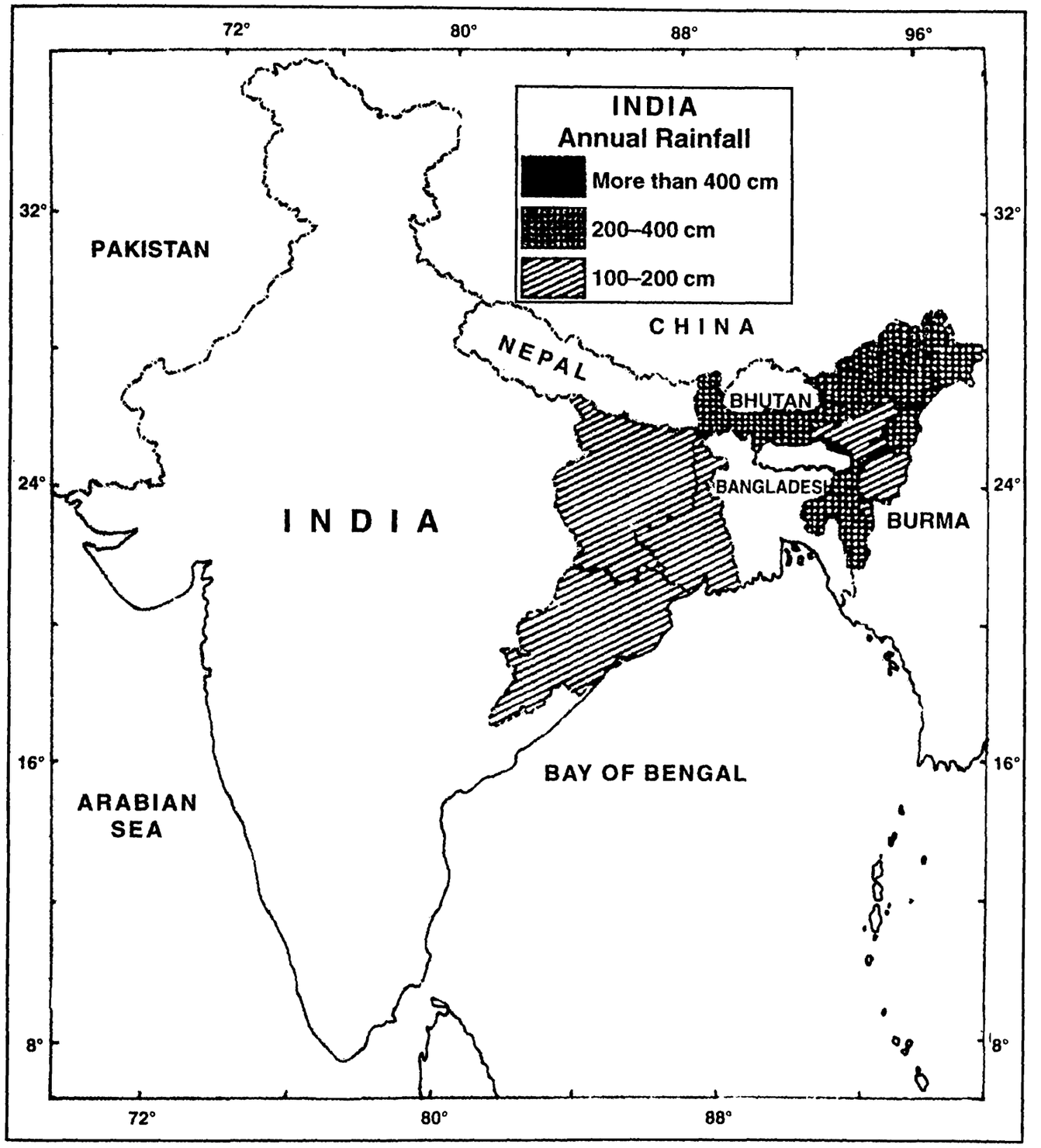


Fig. 10. Annual Rainfall in the study area

TABLE - 1

New Name	Old Names
Andhra Pradesh	Until 1953 the northern half of Madras State including the deltas of the Krishna and Godavari rivers and the hills of the Eastern Ghats.
Arakan	The portion of Lower Burma between the Arakan Yoma and the Bay of Bengal, from the Naaf river to the Irrawady delta.
Arunachal Pradesh	Himalayan foothills and ranges of northern Assam east of Bhutan including the Dalfa, Abor, Miri and Mishmi hills south through the Tirap Frontier tract to the northern -most Patkai ranges on the upper Chindwin drainage area. Before 1972 this was the North-East Frontier Agency (NEFA), consisting of the Kameng, Subansiri, Siang and Lohit divisions.
Assam	Before 1947 this province (subsequently state) included Arunachal Pradesh, Meghalaya, Mizoram and Nagaland. In 1972 the state boundaries of Assam were restricted to the Brahamaputra valley of adjacent plains.
Bangladesh	Constituted in 1971. Formerly from 1947 it was known as East Pakistan; and before that it was part of Bengal. Besides the Brahamaputra plain and eastern delta, includes the Chittagong Hill tracts in south east.
Gujarat	The northern part of the former Bombay presidency includes Saurashtra, Baroda and south along the peninsular coast towards Bombay.
Haryana	The plains area adjacent to the capital district Delhi, in the north, west and south comprising the southern part of the former state (in existence from 1947-1966) of East Punjab.
Himachal Pradesh	The hill states of the Himalayas north and west of Uttar Pradesh were united under this name in 1948, but in 1966 the area of the state was enlarged to include the East Punjab Hill states.
Karnataka	New name for the former State of Mysore (1973).
Kerala	The area between the southwestern coast and the western Ghats formerly known as Travancore and Cochin.
Konkan	The area between the western coast and the Western Ghats north of Kerala and south of Bombay.
Lakshadweep	New name for the Laccadive Islands (1973).
Madhya Pradesh	The borders of this state are very different from those of the Central Provinces of 1947. On the north it has been incorporated the former Central Indian states such as Gwalior, and Bhopal, and its southern part including Nagpur has been merged into Maharashtra.

New Name	Old Names
Maharashtra	This state includes the southern part of the former Bombay Presidency along with parts of the former Central Provinces and Hyderabad state.
Meghalaya	The Garo, Jaintia, Khasi and Western Cachar hill districts, constituted a separate state in 1972.
Mizoram	The Lushai and Mizo hills area of Assam separated as a state in 1972.
Nagaland	The easternmost Cachar Hills (Mt. Japvo) and the Naga Hills area north to the northern Patkai range.
Pakistan	Since 1971 is constituted of former (since 1947 August) West Pakistan including Baluchistan, Sind, West Punjab, North West Frontier Province and several incorporated states.
Rajasthan	A state in the area formerly known as Rajputana.
Saurashtra	Formerly Kathiwar and Kutch, this union of states was merged into the Gujarat in 1960.
Tamil Nadu	The name given to Madras State (as separated in to Andhra Pradesh and Madras in 1953) in 1969.

There have been many changes in the spelling of the names of the places and some obsolete spellings survive in the text, *viz.*, Poona for Pune, Tapti for Tapi river, Midnapore for Medinipur, Hooghly for Hugli etc. for example. Assam Region was inaccessible to nonresidents. Two names-Burma as well as Myanmar have been used. Lifetinek's (1954) "Malayasia" consists of Lower Thailand, Malaya, Sumatra, Java, Bali, Borneo. Tsuda's (1991 & 2000) "Malaysia" consists of eastern and western political boundaries of modern Malayasian State. Recently created states in India have not been mentioned in geographical distribution.

MATERIALS AND METHODS

(A) *Materials* : The adult dragonflies were collected with the aid of butterfly net and killed with benzene vapour in a glass killing bottle from different parts of eastern India. A fairly large collection of specimens and data on habit and habitats were collected by the investigator since 1966. The specimens were kept in paper envelops for further study.

These collections were augmented further by incorporating more materials collected by other staff of the Zoological Survey of India, a small collections were also made available through the courtesy of friends. The specimens from Nagaland could not be obtained in a sufficient number because of the local disturbances. Collections had been available from about three hundred localities of eastern India.

The present contribution is based on these collections placed at the disposal of the investigator through the kindness of the Director, Zoological Survey of India, Calcutta.

(B) *Methods* : The specimens were studied under a dissecting binocular and a standard scale was used for measurements.

Doubtful specimens were sent to the Late Dr. M.A. Lieftinck, Rhenen, The Netherlands, the Late Dr. D.E. Kimmins, of the British Museum (Nat. Hist.), London, and to Dr. (Mrs.) Leonora K. Gloyd of the Museum of Zoology, University of Michigan, Michigan,

USA. for their kind opinion. In general, the diagrams were made with the aid of camera-lucida. Sometimes assistances have been taken from Dr. A. R. Lahiri and Dr. Mahabir Prasad for identification and drawings.

Intraspecific variations were studied by comparing the specimens with the standard descriptions given by Fraser in his Fauna of British India volumes and by other workers and comparisons were made with the reference collections available in the Zoological Survey of India, Calcutta. Indeed, the localities for collections were seriously indexed for convenience. Hence, in the text important areas along with their index number had been often cited. In case of village and other insignificant localities only index number has been given. Accordingly, the names of the localities as well as index number has been displayed as under.

Important synonyms have been presented, repetition of synonyms and records of authorities in citing distribution of species and subspecies have been avoided in some cases. In distribution *Past Records* indicates the records of places from where the species was recorded before the present study. It includes Indian localities as well as localiies outside India (Elsewhere).

INDEX NUMBER OF LOCALITIES OF COLLECTIONS AND NAME OF COLLECTORS

(1) Abubari coll. J. M. Julka; (2) Agartala coll. G. Sen; (2a) Aibawk coll. J. K. Jonathan, S.S. Saha & T.R. Mitra; (3) Alabari coll. S.S. Saha; (4) Ambassa coll. N. Muraleedharan; (5) Ambassa forest coll. M.S. Shisodia; (6) Amanda Road coll. S. K. Gupta; (7) Anugul coll. K. Rai, S. K. Gupta, T. G. Vazirani; (8) Assam Foot hill coll. S. K. Tandon; (9) Assam Hill Forest coll. S. K. Gupta; (10) Baghar coll. A. R. Lahiri; (10a) Baghmara coll. S.M. Ali; (10b) Bagna coll. S.M. Ali; (11) Bahimar coll. T.R. Mitra; (12) Bahligaon coll. S. K. Tandon, G. S. Arora, (13) Bajra Bari coll. N. Muraleedharan; (14) Balasore coll. T. G. Vazirani; (15) Baliwari coll. S. K. Tandon, G. S. Arora; (16) Bali coll. T. R. Mitra; (17) Bamanguri coll. S. B. Roy; (18) Bamanpokri coll. H. S. Sharma; (19) Bama village coll. S. K. Tandon, G. S. Arora; (19a) Bangriposi coll. K. Rai; (20) Bankar coll. N. Muraleedharan; (21) Bankura coll. T. R. Mitra; (22) Bansbari coll. S. S. Saha; (23) Baramura coll. N. Muraleedharan; (24) Baraiburu coll. T. R. Mitra; (24a) Barasat coll. S. S. Saha; (25) Barrackpore coll. K. K. Ray, T.R. Mitra; (26) Baripada coll. S.K. Gupta; (27) Barsham coll. S. Khera; (28) Bella village coll. S. K. Tandon, G. S. Arora; (28a) Belonia coll. N. Muraleedharan; (29) Bermi Pani coll. S.M. Ali; (30) Betla coll. T. R. Mitra; (31) Bhalia Abhoynagar coll. M.S. Shisodia; (32) Bhalukpong coll. S.K. Tandon; (32a) Bhangaduni coll. S.M. Ali; (33) Bhangsola coll. M.S. Shisodia; (34) Bhutbari coll. J.K. Jonathan, G.K. Srivastava, S. Khera; (35) Bhutia Basti coll. G. K. Srivastava; (35a) Bijanbari coll. J. K. Jonathan; (36) Bijani coll. S.K. Gupta; (37) Bisalgarh coll. V.C. Agarwal; (38) Bishenpur coll. B.C. Saha; (38a) Bishnupur coll. T.R. Mitra; (38b) Bolangir coll. J.K. Sen, J.M. Julka; (38c) Bluemountain coll. S.K. Chattopadhyay; (39) Bolpur coll. B. Das; (40) Bongongpara coll. S.K. Gupta; (41) Botsa coll. B.C. Saha; (42) Brahi coll. T.R. Mitra; (43) Bramachera coll. M.S. Shisodia; (44) Basak village coll. S.K. Tandon, G.S. Arora; (45) Bughmang coll. A.R. Lahiri; (45a) Bung coll. J.K. Jonathan, S.S. Saha; T.R. Mitra; (46) Bungmal coll. M.S. Shisodia; (47) Burmaborder East coll, M.S. Shisodia; (48) Burma Nulla coll. S. Biswas; (49) Buxa coll. S. K. Chatterjee; (50) Bygoria coll. B.C. Nandi; (51) Cachar coll. B.C. Saha; (52) Calcutta and environs coll. T.R. Mitra, A.R. Lahiri, R. Ram; (53) Canning coll. T.R. Mitra; (54) Chaibasa coll. T.R. Mitra; (55) Chailangta coll. V.C. Agarwal; (56) Chakaroad coll. S. Biswas; (57) Chakraghat coll. N. Muraleedharan; (57a) Chamilini coll. V.C. Agarwal; (57b) Champhai and environs coll. J.K. Jonathan, S.S. Saha,

T.R. Mitra; (58) Chandili coll. D.P. Sanyal; (59) Chandmanitala coll. V.C. Agarwal; (60) Chandan Forest coll. S. Biswas; (61) Chandpur coll. M.S. Shisodia; (62) Chandapur coll. K. Rai; (63) Chandrapur coll. N. Muraleedharan; (64) Chanibari coll. V.C. Agarwal; (65) Chatna coll. T.R. Mitra; (66) Chhaihthang coll. K.R. Rao; (67) Chilka coll. S.R. Dey Sarkar; R.L. Chowdhury; (68) China Bangsi Forest coll. N. Muraleedharan; (69) Chinibagan coll. N. Muraleedharan; (70) Chipadohar coll. T.R. Mitra; (71) Chunbhatti coll. R.K. Ghosh; (72) Chulung coll. B.C. Nandi; (73) Chunthang coll. T.R. Mitra; (73a) Churachandpur coll. S.K. Gupta; (74) Cuttack coll. A.P. Kapur, R.K. Kacker, R.L. Chowdhuri; (75) Dalingkote coll. G.K. Srivastava, P.K. Maiti; (76) Dallivillage coll. S.K. Tandon, G.S. Arora; (77) Dallo coll. S.K. Gupta; (78) Daltongonj coll. S.M. Ali; (79) Damadali coll. N. Muraleedharan; (80) Daporijo coll. S.K. Tandon, G. S. Arora; (81) Darjiling coll. H.S. Sharma; (82) Dannagiri coll. S.B. Ray; (83) Dharmachera coll. M.S. Shisodia; (84) Deban north coll. S. Biswas; (85) Dejoo coll. A.N.T. Joseph; (86) Dentom coll. B.C. Nandi; (87) Deomali Forest coll. G.S. Arora; (88) Dhenkanal area coll. K. Rai; (89) Dhubri coll. S.K. Gupta; (90) Dhutra coll. S.K. Gupta, S. Khera; (91) Digha coll. T.R. Mitra; (92) Doimari coll. S.S. Saha; (93) Dolobari coll. M.S. Shisodia; (94) Dubrajpur coll. B. Das, G.C. De; (95) Dulla coll. S.K. Tandon, G.S. Arora; (96) Dum Dum coll. T.R. Mitra; (97) Dungabari coll. S. Ahmed; (98) Durgapur coll. S. B. Roy; (99) Elephant Flat coll. S.K. Tandon; (100) Fagakchaokhiai coll. A.R. Lahiri (100a) Gilagudi coll. S.K. Tandon, G.S. Arora; (101) Gamaibari coll. M.S. Shisodia; (102) Gamartilla coll. N. Muraleedharan; (103) Gangtak coll. B.C. Nandi; (104) Ganjam and environs coll. R.L. Chowdhuri; (105) Garjee China Forest Coll. M.S. Shisodia; (106) Garjee coll. M.S. Shisodia; (107) Garobasti coll. M.S. Shisodia; (108) Garu coll. T.R. Mitra; (109) Garubathan coll. G.K. Srivastava, R.K. Ghose; (109a) Gayabari coll. A.R. Bhowmik; (110) Geyzing coll. B.C. Nandi; (111) Gibbons land coll. S. Biswas; (112) Gilagadi coll. S.K. Tandon, G.S. Arora; (113) Ghomti coll. G.S. Srivastava; (114) Gobind coll. N. Muraleedharan; (114a) Gomaibari coll. M.S. Shisodia; (115) Golabari coll. M.S. Shisodia; (116) Goke coll. H.S. Sharma; (117) Gopalpur coll. M. Hafizullah; (117a) Gobardanga coll. T.R. Mitra; (118) Gossaigaon coll. S.K. Gupta, S.S. Saha; (119) Guyjong coll. S.B. Roy; (119a) Haldi coll. S.M. Ali; (120) Hamirchara coll. M.S. Shisodia; (120a) Howrah coll. T.R. Mitra; (121) Harinchera coll. M.S. Shisodia; (122) Haplong coll. N. Muraleedharan; (123) Hapoli coll. S. Biswas; (124) Hasnabad coll. T.R. Mitra; (125) Hathalia coll. V.C. Agarwal; (126) Hazaribagh coll. T.R. Mitra; (127) Hoke coll. H.S. Sharma; (128) Hongpong coll. H.K. Bhowmik; (129) Hundung coll. M.S. Shisodia; P.T. Cherrian; (130) Imphal coll. M.S. Shisodia, B.C. Saha; (130a) Ithai village coll. R.P. Mukherjee; (131) Jairampur coll. G.S. Arora; (131a) Jalpaiguri and environs coll. S.R. Dey Sarkar; (132) Jamduar coll. S.S. Saha, T.R. Mitra; (133) Jamirchera coll. M.S. Shisodia; (134) Jatinga coll. S.K. Chatterjee; (135) Jaynagar coll. V.C. Agarwal; (136) Jhalung coll. G.K. Srivastava, P.K. Maiti; (137) Jharpara coll. K. Rai, T.G. Vazirani; (138) Jharansai coll. K. Rai; (139) Jhilmili coll. T. R. Mitra; (139a) Jirampur coll. G.S. Arora; (140) Jorethang coll. B.C. Saha; (141) Jimighat coll. P.T. Cherrian; (142) Joranda coll. S.M. Ali; (143) Joshipur coll. T. G. Vazirani, S. M. Ali; T.R. Mitra; (144) Kabi coll. B.C. Nandi; (145) Kachugaon coll. S.S. Saha, T.R. Mitra; (146) Kahitama coll. S.S. Saha; (147) Kalhandi coll. D.P. Sanyal; (148) Kaliasahar coll. N. Muraleedharan; (149) Kalimpong coll. H.S. Sharma, G.K. Srivastava, P.K. Maiti; (150) Kalyani coll. T.R. Mitra; (151) Kambong coll. S.K. Tandon, G.S. Arora (152) Kanchannagar coll. M.S. Shisodia; (153) Kangrai coll. M. Datta; (154) Karmala coll. H.S. Sharma; (156) Kaziranga coll. S.K. Tandon, S.K. Gupta; (157) Keibul coll. P.T. Cherrian; (158) Keonjhar coll. S.K. Gupta; (159a) Keonjhargarh coll. K. Rai,

T.G. Vazirani; (159b) Khanikhola; (160) Khasia Mangal coll. N. Muraleedharan; (161) Khumari coll. G.K. Srivastava, P.K. Maiti; (162) Khonsa coll. G.S. Arora; (163) Kharagpur coll. T.R. Mitra; (164) Kunjamera coll. M.S. Shisodia; (165) Kimmri coll. A.N.T. Joseph; (166) Kochbehar coll. H.K. Bhowmik; (167) Kolosib coll. K.R. Rao; (168) Koraput coll. D.P. Sanyal, S.K. Gupta, K.R. Rao; (169) Kohima coll. M. Kar; (170) Kosilong coll. M.S. Shisodia; (171) Kothagarh coll. P.K. Das; (172) Kunjabari coll. V.C. Agarwal; (172a) Kunjamura coll. M.S. Shisodia; (173) Label North coll. S. Biswas (174) Lachung coll. T.R. Mitra; (175) Lamka coll. B.C. Saha; (176) Lekhabali coll. S.K. Tandon, G.S. Arora; (177) Likhai village coll. A.R. Lahiri; (178) Loharband coll. N. Muraleedharan; (179) Lohitpur Road coll. S.K. Tandon; (180) Loktak lake coll. M.S. Shisodia; (181) Maghaghaon coll. A.N.T Joseph; (182) Mahanadi coll. A.R. Bhowmik; (183) Maichera coll. N. Muraleedharan; (184) Mainama coll. N. Muraleedharan; (185) Makranpur coll. B. Das, G.C. De; (186) Makur coll. P.T. Cherrian; (186a) Malda town and environs coll. T.R. Mitra; (187) Malkangiri coll. D.P. Sanyal; (188) Mangan coll. B.C. Nandi; (189) Manibhanjang coll. J.K. Jonathan; (189a) Manircherra coll. M.S. Shisodia; (190) Mansghmukh Road coll. G.S. Arora; (191) Maromar coll. T.R. Mitra; (192) Mansong coll. A.R. Bhowmik; (192a) Manu and environs coll. M.S. Shisodia; (192b) Mao coll. P.T. Cherrian (193) Mathurapur coll. S. Khera; (194) Mayurbhanj areas coll. T.G. Vazirani; (195) MBB College coll. M.S. Shisodia; (195a) Mechua Khal coll. S.M. Ali; (196) ME School coll. M.S. Shisodia; (197) Meghabasti coll. S.K. Tandon, G.S. Arora; (198) Melli coll. G.K. Srivastava, G.S. Arora, A.R. Bhowmik; (199) Memmari coll. M. Ghosh; (200) Mikir Hills coll. S.K. Gupta; (201) Moco North coll. Sept. 1975; (202) Moirang coll. R.P. Mukherjee, A.R. Lahiri, B.C. Saha; (203) Mongpow coll. H.K. Bhowmik; (204) Morch coll. M.S. Shisodia, P.T. Cherrian, P.T. Cherrian, B.C. Saha; (205) Morchi coll. P.T. Cherrian; (206) Morchilockchuraria Bank coll. P.T. Cherrian; (207) Morch Laksh coll. M.S. Shisodia; (208) Naharkatiya Road coll. G.S. Arora; (209) Naihati coll. T.R. Mitra; (209a) Nalbani coll. T.R. Mitra; (210) Nalhati coll. B. Das, G.C. De; (211) Namdhapa coll. S. Biswas; (212) Nampolong coll. P.T. Cherrian, G.S. Arora; (212a) Namsai coll. S.K. Tandon; (212b) Namsong Road coll. G.S. Arora; (213) Nayabazar coll. B.C. Nandi; (214) Nazook coll. G.K. Srivastava; (215) Netaji Palli coll. N. Muraleedharan; (216) New chura chandpur coll. M.S. Shisodia; (217) Nissangaon coll. S.B. Roy; (218) Nongthukong village coll. M. Datta; (219) Nowgong coll. S.K. gupta; (220) Old Jirring coll. S.K. Tandon, G.S. Arora; (221) Padung village coll. S.K. Tandon, G.S. Arora; (222) Palamau coll. S.M. Ali; (223) Pamir bridge coll. A.N.T. Joseph; (224) Panali East coll. M.S. Shisodia; (225) Panali West coll. N. Muraleedharan, (226) Pankhabari coll. R.K. Ghose, T.R. Mitra; (227) Patna coll. T.R. Mitra; (228) Perying village coll. S.K. Tandon, G.S. Arora; (228a) Phaileng area coll. J.K. Jonathan, S.S. Saha, T.R. Mitra; (229) Phensong coll. B.C. Nandi; (230) Phulbari coll. D.P. Sanyal, S.K. Gupta; (231) Pirjuli coll. A.N. T. Joseph; (232) Pratapgarh coll. M.S. Shisodia; (233) Puri coll. A.P. Kapur, R.K. Kacker, R.L. Chowdhuri; (234) Rabangla coll. T.R. Mitra; (235) Raimona coll. S.S. Saha, T.R. Mitra; (236) Rajnagar coll. M.S. Shisodia; (237) Raja Nagar coll. B. Das, G.C. De; (238) Rambi coll. G.K. Srivastava; (238a) Ram Nagar coll. S.B. Roy; (239) Rampur coll. D.P. Sanyal; (240) Ram Pur coll. B. Das, G.C. De; (241) Rampurhat coll. B. Das, G.C. De; (242) Rangdom coll. B.C. Nandi; (243) Rangeet coll. P.K. Maiti; (244) Rangpo coll. H.S. Sharma, J.K. Jonathan; (245) Rangpoo coll. T.G. Vazirani; (246) Ranipool coll. T.G. Vazirani, T.R. Mitra; (246a) Reang coll. G.K. Srivastava, P.K. Maiti; (247) Regan coll. H.S. Sharma; (248) Reydak coll. H.K. Bhowmik; (249) Rongram coll. N. Muraleedharan; (250) Saikot coll. A.R. Lahiri; (250a) Sajnekhali coll.

S.M. Ali; (251) Salkapara coll. H.K. Bhowmik; (252) Sambalpur coll. J.K. Sen, J.M. Julka; (253) Samsing coll. R.K. Ghose, T.R. Mitra; (254) Sangsak coll. N. Muraleedharan; (255) Santiniketan coll. B. Das, G.C. De; (256) Santragachi coll. R. Ram; (257) Seoraphuli coll. R.K. Kacker; (258) Serchip coll. K.R. Rao; (259) Sessa Coll. S.K. Tandon; (260) Shambati coll. B. Das (261) Sheikhbari coll. V.C. Agarwal; (262) Shivpur village coll. M.S. Shisodia; (263) Siji coll. S.K. Tandon, G.S. Arora; (264) Silchar and environs coll. B.C. Saha; (264a) Simlipal coll. S.M. Ali; (265) Singur coll. A.K. Mondal; (266) Singla coll. H.S. Sharma; (267) Singnat coll. A.R. Lahiri; (268) Siram Bridge coll. S.K. Tangon, G.S. Arora; (269) Sitapari coll. S.K. Tandon; (270) Sonsang area coll. N. Muraleedharan; (271) Sriniketan coll. B. Das, G.C. De; (272) Sripur coll. N. Muraleedharam; (273) Subansiri Bridge coll. S.K. Tandon, G.S. Arora; (273a) Sugan Sara coll. M.S. Shisodia; (274) Sundarbans coll. S.M. Ali; (275) Sundergarh and environs coll. J.M. Julka, T.K. Sen, J.K. Sen; (276) Sukhna coll. G.K. Srivastava, G.S. Arora; (276a) Sunpara coll. S.K. Tandon & Party (277) Susunia coll. T.R. Mitra; (278) Tachidome coll. S.K. Tandon, G.S. Arora; (279) Tameng coll. A.N.T. Joseph; (280) Tappi coll. S.K. Tandon, G.S. Arora; (281) Tarkhola coll. A.R. Bhowmik; (281a) Teliamura and environs coll. N. Muraleedharan; (281b) Terei and environs coll. J.K. Jonathan, S.S. Saha, T.R. Mitra; (282) Tezpur and environs coll. S.K. Tandon; (283) Thakurpukur coll. T.R. Mitra; (284) Tikarpara coll. S. Biswas; (285) Tipi coll. A.N.T. Joseph; (285a) Tirapand environs coll. G.S. Arora; (286) Tonglu coll. J.K. Jonathan; (287) Tornu coll. B.C. Saha (287a) Tumin coll. T.R. Mitra; (288) Tunga valley coll. A.N.T. Joseph; (289) Tum Tangkhol; coll. G.K. Srivastava, G.S. Arora; (289a) Udaipur and environs coll. M.S. Shisodia; (290) Upper Barakamra coll. S.M. Ali; (290a) Ukhrul coll. N. Muraleedharan; (291) Vijiny coll. S. Biswas; (292) Ukhrail coll. P.T. Cherrian; (293) Wakroo coll. J.M. Julka; (293a) Zhilla coll. S.M. Ali; (294) Ziro coll. A.N.T. Joseph. After finalisation a few localities have been added.

ABBRIVATIONS AND GLOSSARY OF SCIENTIFIC TERMS USED

Following terms have been employed from Fraser (1933c, 1934b & 1936a) (Figs. 11, 12, 13)

(A) Abbreviations

Ab: Anal bridge; Ac: Anal crossing: Cu_2 : Second Cubitus; IA: First Anal Vein; MA: Anterior median: mm: Millimetres; R_2 : IR_2R_3 : IR_3 : R_{4+5} : Branches and intercalated branches of Radius : R_{spl} : Radial supplement.

(B) Glossary

Anal appendage: Small process at the end of the abdomen of the adult insect. In male Anisoptera there is one pair superior and a single inferior; while in male Zygoptera there are two pairs; in the female of both suborders there is only one pair.

Anal bridge: A short longitudinal vein which runs from Ac parallel to the underside of the discoidal cell and is continued as IA in the Zygoptera.

Anal crossing: A small transverse nervure at the base of the wing, traversing cubital space. It is in actual sense a vestigeal crossing over of the anal vein to be continued as the nervure IA (Fraser 1933c).

Anal loop: An area of cells situated at the base of hindwing in many genera of the Anisoptera. It lies adjacent to and posterior to the discoidal cell.

Anal triangle: A triangle at the extreme base of the hindwing in the Anisoptera.

Anteclypeus: The part of the clypeus to which the labrum is attached.

Antehumeral stripe: A coloured line on the dorsum of the thorax situated internal to the humeral suture.

Antenodal nervure: Transverse veins running from the costa to the radius, proximal to node (towards the thorax).

Arculus or Arc : Short transverse vein forming the boundary of the basal space.

Basal space : Sometimes termed as the Median space. It is a space at the extreme base of the wing bounded by the radius anteriorly, Cu_2 posteriorly and arc distally.

Bifurcation of R_s : The bifurcation of the superior sector of the arc into R_2 and R_{4+5}.

Bridge : A triangular space bounded outwardly by the oblique vein descending from the node, anteriorly by the nervure R_1 and posteriorly by IR_2.

Clypeus : The lower or the anterior part of the face, to lower part of which the labrum is attached.

Crest of frons : The anterior ridge of the frons. It divides the anterior part from the upper posterior part of the frons.

Cubital space : The space at the extreme base of the wings situated immediately posterior to the basal space and extending out as far as the base of the discoidal cell.

Discoidal cell : A distinct triangle or a quadrilateral situated near the base of the wings immediately distal to the cubital space.

Discoidal field : The space from the distal border of the discoidal cell bounded anteriorly by MA and posteriorly by Cu_2 and outwardly by the wing border.

Dorsum : The back or the superior surface of any part of the body (thorax, abdomen).

Enfumed : Smoky or brownish tint (in wings).

Entire : Adjective applied to any space of the wings which is not traversed by the veins.

Epistome : Postclypeus or the upper part of the clypeus.

Frons : The forehead.

Hamules : Two pairs of minute hooks bounded in the genitalia on the second segment of the male.

Humeral stripe : A coloured line situated on the humeral suture of the thorax or bordering inwardly.

Hyaline : Colourless.

Hypertrigone : A triangle situated above the discoidal cell.

Labium : Lower lip.

Labrum : Upper lip.

Membrane : A narrow membrane bordering the base of the wing in the Anisopterous dragonflies.

Neuration : The network of veins.

Node : A thickening situated at an indentation of the costal margin.

Occiput : Back of the head.

Ocellus : Also known as simple eye. Ocelli are situated in a line infront of the vescicles or arranged in a triangle around it on the vertex of the head.

Ovipositor : The female's appartus for depositing her eggs. It is situated on the ventral surface of the 8th and 9th abdominal segments.

Petiolate : A term applied to the wings when the base is constricted like a stalk.

Posterior lobe of the prothorax : The anterior segment of the thorax or the prothorax is composed of three lobes. The shape of the posterior one varies from one genus to another as well as from one species to another.

Post nodals : Cross veins joining costa and radius, extended from the node to the pterostigma.

Pterostigma : A small thickened area of the wings situated on the costal border near its apex.

Radius : The principal vein which lies between the subcosta and the media.

Sectors of arc : The origins of R_{4+5} and MA.

Vescicle : A small eminence situated on the vertex of the head which either overlaps the ocelli or is situated between them.

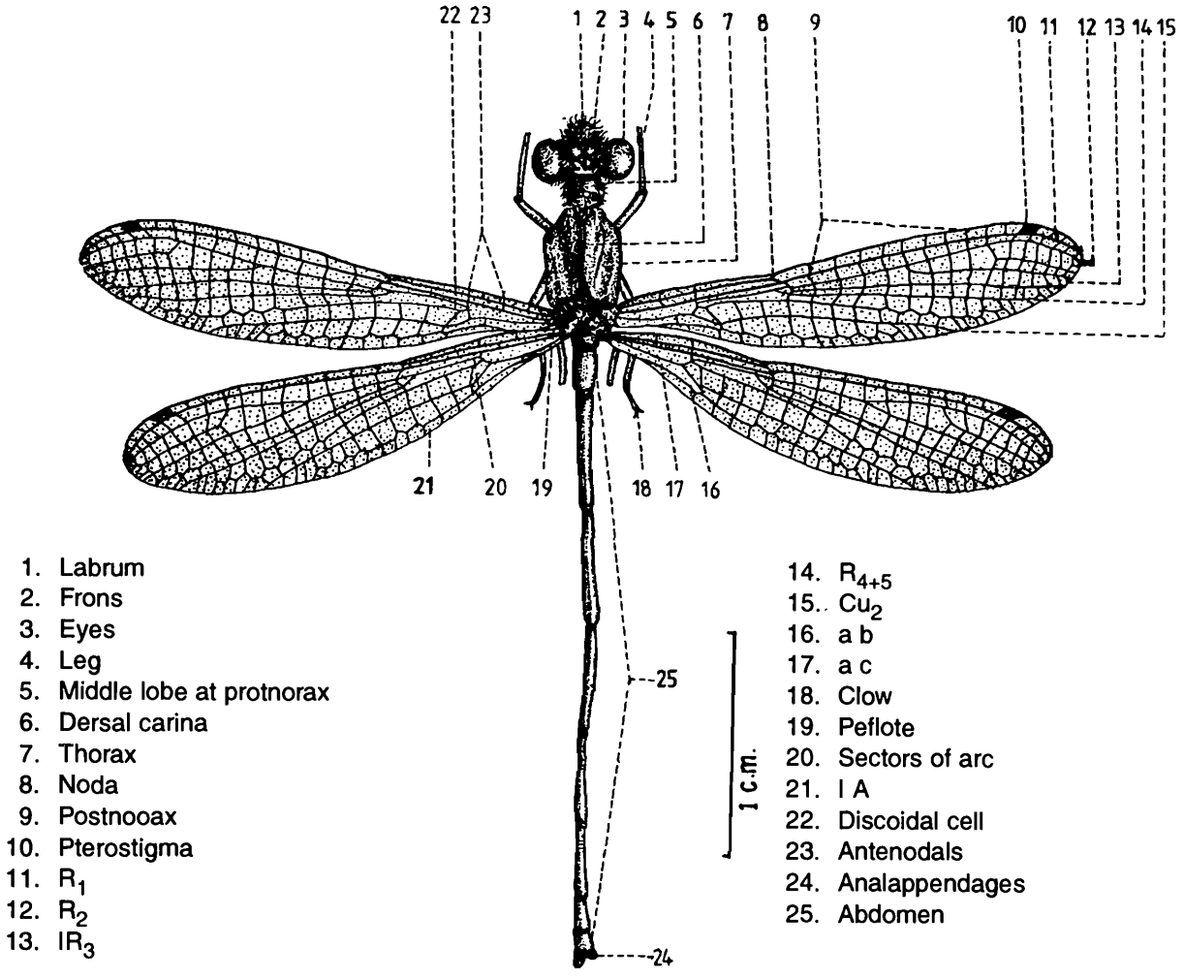


Fig. 11. External Morphology of *Onychargia atrocyana* Selys

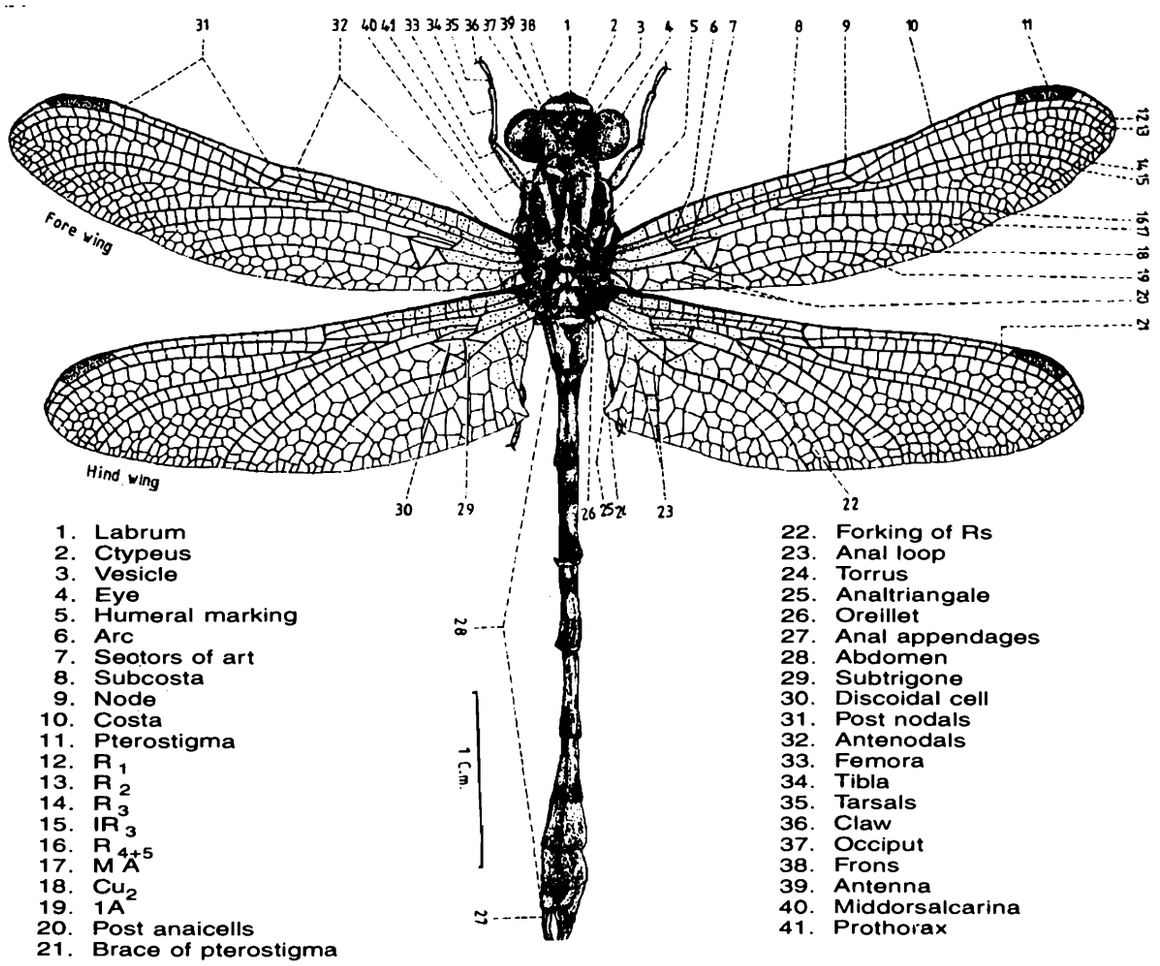


Fig. 12. External Morphology of *Onychogomphus biforceps* Selys

Vulvar scale : The protective sheath of the ovipositor, formed of two plate-like structures attached to the sides of the ventral plates of the 8th and 9th abdominal segments of the adult female.

OBSERVATIONS

Systematic Account, Key for identification Geographical Distribution and Intraspecific variations of the species and subspecies examined.

SYSTEMATICS

Genera have been placed under the Superfamilies/families following Fraser's (1957) "A Reclassification of the Order Odonata" excepting three genera *viz. Urothemis* Brauer, *Aethriamanta* Kirby and *Macrodiplax* Brauer. The genera in question have been placed under the Family Libellulidae following Tsuda (1991) "A distributional list of World Odonata, 1991" Megapodagrionidae has been included in the Superfamily Coenagrionoidea following Lieftinck, M.A., J.C. Lien and T.C. Maa (1984) "Catalogue of Taiwanese dragonflies"; Euphaeidae and Synlestidae stand for Epallagidae and Chlorolestidae respectively.

LIST OF TAXA RECORDED FROM THE AREA UNDER STUDY

Class INSECTA

Order ODONATA

Suborder ZYGOPTERA

Superfamily CALOPTERYGOIDEA

Family CALOPTERYGIDAE

1. Genus ***Neurobasis*** Selys, 1853

1. *Neurobasis chinensis chinensis* (Linné)

2. Genus ***Vestalis*** Selys, 1853

2. *Vestalis gracilis gracilis* (Rambur)
3. *Vestalis apicalis apicalis* Selys
4. *Vestalis smaragdina smaragdina* (Selys)

3. Genus ***Echo*** Selys, 1853

5. *Echo margarita margarita* Selys

4. Genus ***Matrona*** Selys, 1853

6. *Matrona basilaris basilaris* Selys
7. *Matrona basilaris nigripectus Selys*

5. Genus ***Caliphaea*** Selys, 1859

8. *Caliphaea confusa* Selys

Family EUPHAEIDAE

6. Genus ***Bayadera*** Selys, 1853

9. *Bayadera indica* (Selys)
10. *Bayadera longicauda* Fraser

7. Genus ***Anisopleura*** Selys, 1853

11. *Anisopleura comes* Selys
12. *Anisopleura subplatystyla* Fraser
13. *Anisopleura lestoides* Selys

8. Genus ***Euphaea*** Selys, 1840

14. *Euphaea ochracea ochracea* Selys
15. *Euphaea cardinalis* (Fraser)
16. *Euphaea guerini masoni* Selys

9. Genus ***Schmidtiphaea*** Asahina, 1978

17. *Schmidtiphaea schmidi* Asahina

Family AMPHIPTERYGIDAE

10. Genus ***Philoganga*** Kirby, 1890

18. *Philoganga montana* (Selys)

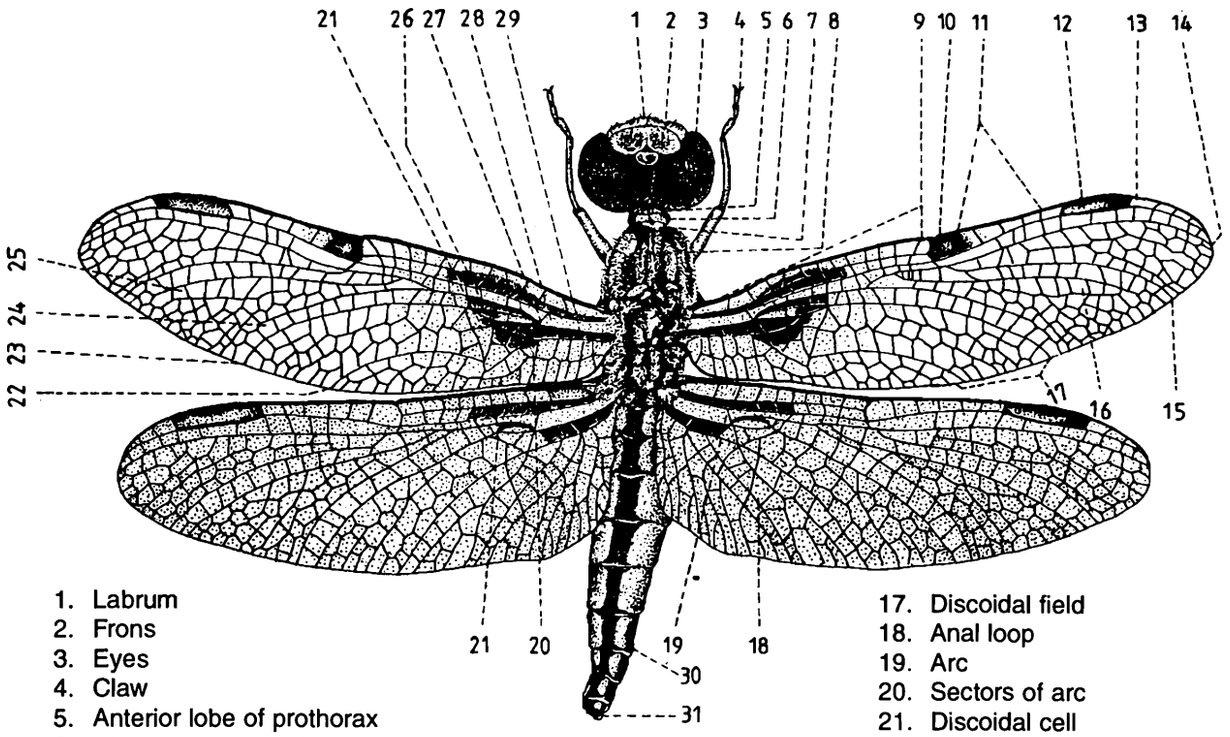
Family CHLOROCYPHIDAE

11. Genus ***Libellago*** Selys, 1840

19. *Libellago lineata lineata* (Burmeister)

12. Genus ***Rhinocypha*** Rambur, 1842

20. *Rhinocypha cuneata* Selys
21. *Rhinocypha ignipennis* Selys
22. *Rhinocypha spuria* Selys
23. *Rhinocypha quadrimaculata Selys*
24. *Rhinocypha fenestrella* Rambur



1. Labrum
2. Frons
3. Eyes
4. Claw
5. Anterior lobe of prothorax
6. Middle lobe of prothorax
7. Posterior lobe of prothorax
8. Middorsal carnia of thorax
9. Antenodals
10. Node
11. Postnodals
12. Pterostigma
13. R_1
14. R_2
15. R_3
16. Rspl
17. Discoidal field
18. Anal loop
19. Arc
20. Sectors of arc
21. Discoidal cell
22. Cu2
23. MA.
24. R4+5
25. I R3
26. Subtrigone
27. Cubital space
28. Basal space
29. Cubital nervure
30. Abdomen
31. Anal appendages

Fig. 13. External Morphology of *Palpopleura sexmaculata* (Fabricius)

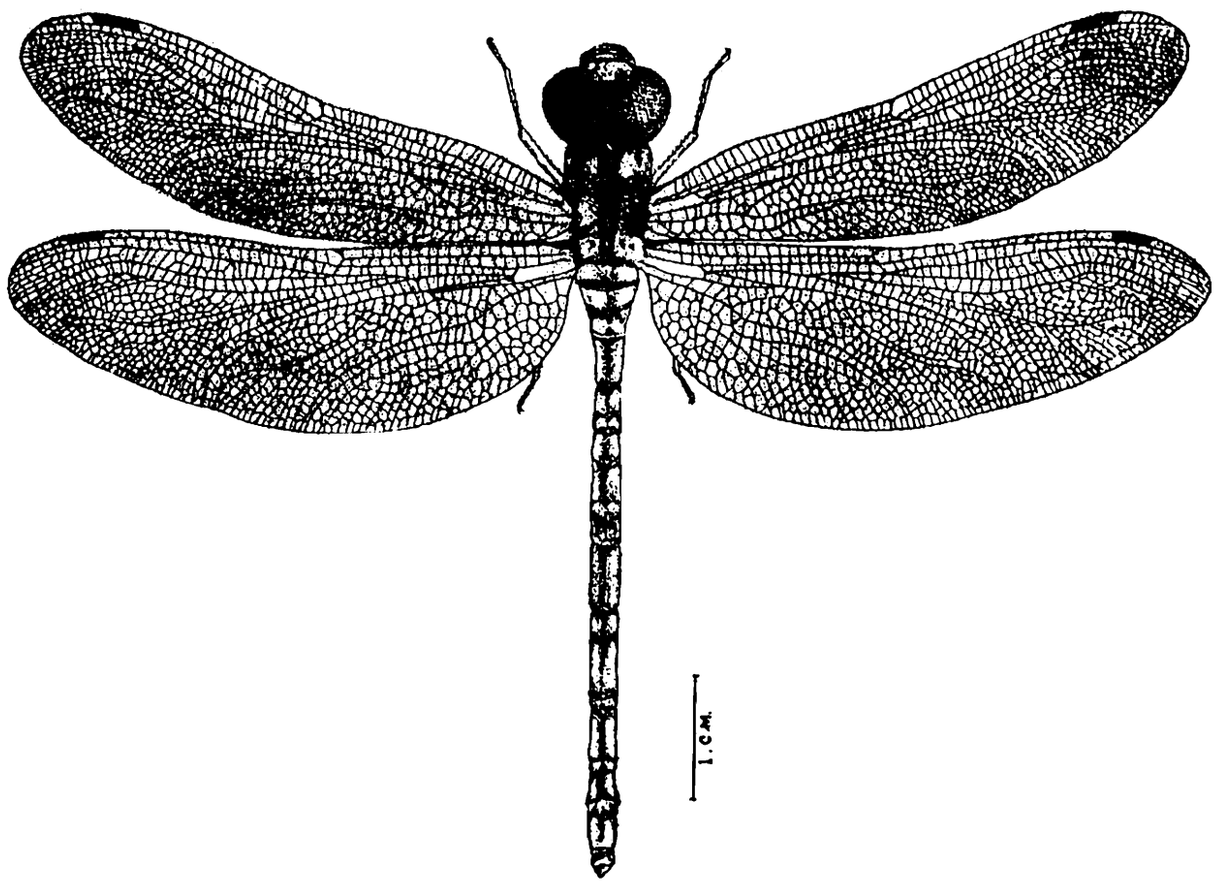


Fig. 14. External Morphology of *Gynacantha ramnohani* Mitra & Lahiri

25. *Rhinocypha unimaculata* Selys
26. *Rhinocypha bifasciata* Selys
27. *Rhinocypha trifasciata* Selys
28. *Rhinocypha immaculata* Selys
29. *Rhinocypha bisignata* Selys
30. *Rhinocypha bifenestrata* Fraser
31. *Rhinocypha trimaculata* Selys
32. *Rhinocypha perforata beatifica* Fraser
33. *Rhinocypha perforata limbata* Selys
34. *Rhinocypha biforata biforata* Selys
35. *Rhinocypha vitrinella* Fraser

Superfamily LESTOIDEA

Family LESTIDAE

13. Genus ***Lestes*** Leach, 1815

36. *Lestes dorothea* Fraser
37. *Lestes elatus* Hagen
38. *Lestes viridulus* Rambur
39. *Lestes nodalis* Selys
40. *Lestes garoensis* Lahiri
41. *Lestes umbrinus* Selys
42. *Lestes platystylus* Rambur
43. *Lestes* sp. Indet.
44. *Lestes praemorsus decipiens* (Kirby)
45. *Lestes praemorsus sikkima* Fraser
46. *Lestes praemorsus praemorsus* Selys
47. *Lestes nigriceps* Fraser
48. *Lestes thoracicus* Laidlaw

14. Genus ***Indolestes*** Fraser, 1922

49. *Indolestes cyaneus* (Selys)

15. Genus ***Orolestes*** Mclachlan, 1895

50. *Orolestes durga* Lahiri

Family SYNLESTIDAE

16. Genus ***Megalestes*** Selys, 1862

51. *Megalestes major* Selys
52. *Megalestes lieftincki* Lahiri
53. *Megalestes irma* Fraser

Superfamily COENAGRIONOIDEA

Family MEGAPODAGRIONIDAE

17. Genus ***Burmargiolestes*** Kennedy, 1925

54. *Burmargiolestes laidlawi* Lieftinck

Family PLATYSTICTIDAE

18. Genus ***Protosticta*** Selys, 1885

55. *Protosticta himalaica* Laidlaw

19. Genus ***Drepanosticta*** Laidlaw, 1917

56. *Drepanosticta carmaichaeli* Laidlaw
57. *Drepanosticta polychromatica* Fraser

Family PROTONEURIDAE

20. Genus ***Disparoneura*** Selys, 1860

58. *Disparoneura quadrimaculata* (Rambur)

21. Genus ***Caconeura*** Kirby, 1890

59. *Caconeura gomphoides* (Rambur)

22. Genus ***Elattoneura*** Cowley, 1935

60. *Elattoneura campioni campioni* (Fraser)
61. *Elattoneura campioni cacharensis* (Fraser)

23. Genus ***Prodasineura*** Cowley, 1934

62. *Prodasineura odoneli* (Fraser)
63. *Prodasineura verticalis burmanensis* (Fraser)

Family PLATYCNEMIDIDAE

24. Genus ***Calicnemia*** Strand, 1926

64. *Calicnemia eximia* Selys
65. *Calicnemia miles* Laidlaw
66. *Calicnemia miniata* Selys
67. *Calicnemia mortoni* Laidlaw
68. *Calicnemia sudhaae* Mitra
69. *Calicnemia pulverulans* Selys

25. Genus ***Coeliccia*** Kirby, 1890

70. *Coeliccia bimaculata* Laidlaw
71. *Coeliccia prakritae* Lahiri

72. *Coeliccia renifera* (Selys)
73. *Coeliccia didyma didyma* (Selys)
74. *Coeliccia schmidti* Asahina
75. *Coeliccia rotundata* Asahina
76. *Coeliccia vacca* Laidlaw
77. *Coeliccia rossi* Asahina
78. *Coeliccia loogali* Laidlaw
79. *Coeliccia svihleri* Asahina

26. Genus ***Copera*** Kirby, 1890

80. *Copera marginipes* (Rambur)
81. *Copera vittata serapica* (Selys)
82. *Copera vittata assamensis* Laidlaw
83. *Copera ciliata* (Selys)
84. *Copera superplatypes* Fraser

Family COENAGRIONIDAE

27. Genus ***Pseudagrion*** Selys, 1876

85. *Pseudagrion microcephalum* (Rambur)
86. *Pseudagrion australasiae* Selys
87. *Pseudagrion malabaricum* Fraser
88. *Pseudagrion decorum* (Rambur)
89. *Pseudagrion hypermelas* Selys
90. *Pseudagrion rubriceps rubriceps* Selys
91. *Pseudagrion spencei* Fraser

28. Genus ***Ceriagrion*** Selys, 1876

92. *Ceriagrion coromandelianum* (Fabricius)
93. *Ceriagrion praetermissum* Lieftinck
94. *Ceriagrion fallax cerinomelas* Lieftinck
95. *Ceriagrion olivaceum* Laidlaw
96. *Ceriagrion* sp. indet.
97. *Ceriagrion cerinorubellum* (Brauer)
98. *Ceriagrion azureum* (Selys)
99. *Ceriagrion coeruleum* Laidlaw

29. Genus ***Cercion*** Navas, 1907

100. *Cercion malayanum* Selys
101. *Cercion calamorum dyeri* (Fraser)

30. Genus ***Aciagrion*** Selys, 1891

102. *Aciagrion occidentale* Laidlaw
103. *Aciagrion olympicum* Laidlaw
104. *Aciagrion hisopa hisopa* (Selys)
105. *Aciagrion approximans* (Selys)
106. *Aciagrion pallidum* Selys
107. *Aciagrion azureum* Fraser
108. *Aciagrion borneense* Ris

31. Genus ***Ischnura*** Charpentier, 1840

109. *Ischnura senegalensis* Rambur
110. *Ischnura elegans elegans* (Vander Linden)
111. *Ischnura forcipata* Morton
112. *Ischnura aurora aurora* Brauer
113. *Ischnura rufostigma rufostigma* Selys
114. *Ischnura rufostigma anandalei* Laidlaw
115. *Ischnura rufostigma mildredae* Fraser

32. Genus ***Rhodischnura*** Laidlaw, 1919

116. *Rhodischnura nursei* (Morton)

33. Genus ***Enallagma*** Selys, 1876

117. *Enallagma parvum* Selys
118. *Enallagma insulae* Fraser (Status doubtful.)

34. Genus ***Argiocnemis*** Selys, 1877

119. *Argiocnemis rubescens rubeola* Selys

35. Genus ***Agriocnemis*** Selys, 1877

120. *Agriocnemis lacteola* Selys
121. *Agriocnemis pieris* Laidlaw
122. *Agriocnemis clauseni* Fraser
123. *Agriocnemis nana* Laidlaw
124. *Agriocnemis splendidissima* Laidlaw
125. *Agriocnemis pygmaea pygmaea* (Rambur)

126. *Agriocnemis femina femina* (Brauer)
127. *Agriocnemis dabreui* Fraser

36. Genus ***Mortonagrion*** Fraser, 1920

128. *Mortonagrion aborense* (Laidlaw)

37. Genus ***Himalagrion*** Fraser, 1910

129. *Himalagrion exclamatione* Fraser

38. Genus ***Onychargia*** Selys, 1865

130. *Onychagia atrocyana* Selys
131. *Onychagia* sp. indet.

Suborder ANISOZYGOPTERA
Superfamily HETEROPHLEBOIDEA
Family EPIOPHLEBIDAE

39. Genus ***Epiophlebia*** Calvert, 1903

132. *Epiophlebia laidlawi* Tillyard

Suborder ANISOPTERA
Superfamily AESHNOIDEA
Family GOMPHIDAE

40. Genus ***Nihonogomphus*** **Oguma,** 1926

133. *Nihonogomphus pulcherrimus* (Fraser)

41. Genus ***Onychogomphus*** Selys, 1854

134. *Onychogomphus striatus* Fraser
135. *Onychogomphus schmidti* Fraser
136. *Onychogomphus biforceps* Selys
137. *Onychogomphus modestus* (Selys)
138. *Onychogomphus grammicus* (Rambur)
139. *Onychogomphus saundersi* Selys
140. *Onychogomphus duaricus* Fraser
141. *Onychogomphus risi* (Fraser)
142. *Onychogomphus cacharicus* (Fraser)

42. Genus ***Phaenandrogomphus*** Lieftinck, 1964

143. *Phaenandrogomphus aureus* (Laidlaw)

43. Genus ***Stylogomphus*** Fraser, 1922

144. *Stylogomphus inglisi* Fraser

44. Genus ***Paragomphus*** Cowley, 1934

145. *Paragomphus lineatus* (Selys)
146. *Paragomphus lindgreni* (Fraser)
147. *Paragomphus echinoccipitalis* (Fraser)

45. Genus ***Macrogomphus*** Selys, 1857

148. *Macrogomphus montanus* Selys
149. *Macrogomphus seductus* Fraser

46. Genus ***Ictinogomphus*** Cowley, 1934

150. *Ictinogomphus rapax* (Rambur)
151. *Ictinogomphus distinctus* Ram (Status doubtful)
152. *Ictinogomphus pertinax* Selys
153. *Ictinogomphus angulosus* (Selys)
154 *Ictinogomphus atrox* (Selys)

47. Genus ***Gomphidia*** Selys, 1854

155. *Gomphidia leonoraae* Mitra
156. *Gomphidia williamsoni* Fraser
157 *Gomphidia t-nigram* Selys

48. Genus ***Anormogomphus*** Selys, 1854

158. *Anormogomphus heteropterus* Selys

49. Genus ***Davidius*** Selys, 1878

159. *Davidius aberrans senchalensis* Fraser
160. *Davidius davidi assamensis* Laidlaw

50. Genus ***Cyclogomphus*** Selys, 1854

161. *Cyclogomphus heterostylus* Selys

51. Genus ***Anisogomphus*** Selys, 1857

162. *Anisogomphus occipitalis* Selys
163. *Anisogomphus bivittatus* Selys
164. *Anisogomphus orites* Laidlaw

52. Genus ***Burmagomphus*** Williamson, 1907

165. *Burmagomphus pyramidalis pyramidalis* Laidlaw
166. *Burmagomphus hasimaricus* Fraser
167. *Burmagomphus sivalikensis* Laidlaw

53. Genus ***Merogomphus*** Martin, 1904

168. *Merogomphus martini* (Fraser)

54. Genus ***Asiagomphus*** Asahina, 1984

169. *Asiagomphus odoneli* (Fraser)

55. Genus ***Platygomphus*** Selys, 1854

170. *Platygomphus dolabratus* Selys

56. Genus ***Megalogomphus*** Campion, 1923

171. *Megalogomphus smithi* (Selys)
172. *Megalogomphus flavicolor* (Fraser)

57. Genus ***Perissogomphus*** Laidlaw, 1922

173. *Perissogomphus stevensi* Laidlaw

Family AESHNIDAE

58. Genus ***Gynacantha*** Rambur, 1842

174. *Gynacantha dravida* Lieftinck
175. *Gynacantha bayadera* Selys
176. *Gynacantha khasiaca* MacLachlan
177. *Gynacantha subinterrupta* Rambur
178. *Gynacantha rammohani* Mitra & Lahiri (Status doubtful)
179. *Gynacantha bainbriggei* Fraser
180. *Gynacantha odoneli* Fraser
181. *Gynacantha albistyla* Fraser
182. *Gynacantha basiguttata* Selys
183. *Gynacantha biharica* Fraser
184. *Gynacantha arnaudi* Asahina
185. *Gynacantha millandi* Fraser

59. Genus ***Anax*** Leach, 1815

186. *Anax imperator imperator* Leach
187. *Anax guttatus* Burmeister
188. *Anax parthenope parthenope* Selys
189. *Anax nigrofasciatus nigrolineatus* Fraser
190. *Anax immaculifrons* Rambur.

60. Genus ***Anaciaeschna*** Selys, 1878

191. *Anaciaeschna jaspedia* (Burmeister)

61. Genus ***Hemianax*** Selys, 1883

192. *Hemianax ephippiger* (Burmeister)

62. Genus ***Oligoaeschna*** Selys, 1889

193. *Oligoaeschna martini* (Laidlaw)
194. *Oligoaeschna speciosa* Karube

63. Genus ***Periaeschna*** Martin, 1909

195. *Periaeschna unifasciata* Fraser
196. *Periaeschna magdalena* Martin

64. Genus ***Tetracanthagyna*** Selys, 1883

197. *Tetracanthagyna waterhousei* MacLachlan

65. Genus ***Cephalaeschna*** Selys, 1883

198. *Cephalaeschna masoni* (Martin)
199. *Cephalaeschna acutifrons* (Martin)
200. *Cephalaeschna orbifrons* Selys

66. Genus ***Petaliaeschna*** Fraser, 1927

201. *Petaliaeschna fletcheri* Fraser

67. Genus ***Gynacanthaeschna*** Fraser, 1922

202. *Gynacanthaeschna sikkima* (Karsch)

68. Genus ***Polycanthagyna*** Fraser, 1933

203. *Polycanthagyna ornithocephala* MacLachlan

69. Genus ***Aeshna*** Fabricius, 1775

204. *Aeshna petalura petalura* Martin

Superfamily CORDULEGASTEROIDEA

Family CORDULEGASTERIDAE

70. Genus ***Anotogaster*** Selys, 1854

205. *Anotogaster nipalensis* Selys
206. *Anotogaster gregoryi* Fraser

207. *Anotogaster basalis palampurensis* Fraser

71. Genus ***Chlorogomphus*** Selys, 1854

208. *Chlorogomphus preciosus preciosus* Fraser
209. *Chlorogomphus atkinsoni* (Selys)
210. *Chlorogomphus fraseri* St. Quentin
211. *Chlorogomphus selysi* Fraser
212. *Chlorogomphus mortoni* Fraser

72. Genus ***Cordulegaster*** Leach, 1815

213. *Cordulegaster brevistigma brevistigma* (Selys)

73. Genus ***Neallogaster*** Cowley, 1934

214. *Neallogaster hermionae* (Fraser)
215. *Neallogaster latifrons* (Selys)

Superfamily LIBELLULOIDEA

Family CORDULIIDAE

74. Genus ***Macromia*** Rambur, 1842

216. *Macromia moorei moorei* Selys
217. *Macromia pallida* Fraser
218. *Macromia flavovittata* Fraser
219. *Macromia flavocolorata* Fraser
220. *Macromia flavicincta* Selys
221. *Macromia cingulata* Rambur

75. Genus ***Epophthalmia*** Burmeister, 1839

222. *Epophthalmia vittata vittata* Burmeister
223. *Epophthalmia vittigera bellicosa* Lieftinck
224. *Epophthalmia frontalis frontalis* Selys

76. Genus ***Hemicordulia*** Selys, 1870

225. *Hemicordulia asiatica* Selys

77. Genus ***Idionyx*** Hagen, 1867

226. *Idionyx imbricata* Fraser

Family LIBELLULIDAE

78. Genus ***Urothemis*** Brauer, 1868

227. *Urothemis signata signata* (Rambur)

79. Genus ***Aethriamanta*** Kirby, 1889

228. *Aethriamanta brevipennis* (Rambur)

80. Genus ***Macrodiplax*** Brauer, 1868

229. *Macrodiplax cora* (Brauer)

81. Genus ***Tetrathemis*** Brauer, 1868

230. *Tetrathemis platyptera* Selys

82. Genus ***Hylaeothemis*** Ris, 1909

231. *Hylaeothemis fruhstorferi apicalis* Fraser

83. Genus ***Lyriothemis*** Brauer, 1868

232. *Lyriothemis bivittata* (Rambur)
233. *Lyriothemis cleis* Brauer
234. *Lyriothemis acigastra* (Selys)

84. Genus ***Agrionoptera*** Brauer, 1864

235. *Agrionoptera insignis* (Rambur)

85. Genus ***Amphithemis*** Selys, 1891

236. *Amphithemis curvistyla* Selys
237. *Amphithemis vacillans* (Selys)

86. Genus ***Nannophya*** Rambur, 1842

238. *Nannophya pygmaea* (Rambur)

87. Genus ***Lathrecista*** Kirby, 1889

239. *Lathrecista asiatica asiatica* Fabricius

88. Genus ***Cratilla*** Kirby, 1900

240. *Cratilla lineata* (Brauer)

89. Genus ***Potamrcha*** Karsch, 1890

241. *Potamrcha congener* (Rambur)

90. Genus ***Orthetrum*** Newman, 1833

242. *Orthetrum brunneum brunneum* Fonscolombe
243. *Orthetrum* sp. indet
244. *Orthetrum anceps* (Schneider)
245. *Orthetrum taeniolatum* (Schneider)
246. *Orthetrum luzonicum* (Brauer)
247. *Orthetrum sabina sabina* (Drury)
248. *Orthetrum cancellatum cancellatum* (Linnaeus)
249. *Orthetrum japonicum internum* MacLachlan

250. *Orthetrum triangulare triangulare* (Selys)
251. *Orthetrum glaucum* (Brauer)
252. *Orthetrum testaceum testaceum* (Burmeister)
253. *Orthetrum pruinosum neglectum* (Rambur)
254. *Orthetrum chrysis* (Selys)

91. Genus ***Palpopleura*** Rambur, 1842

255. *Palpopleura sexmaculata sexmaculata* (Fabricius)

92. Genus ***Brachydiplax*** Brauer, 1868

256. *Brachydiplax sobrina* (Rambur)
257. *Brachydiplax farinosa* (Kruger)
258. *Brachydiplax chalybea chalybea* Brauer

93. Genus ***Acisoma*** Rambur, 1842

259. *Acisoma panorpoides panorpoides* Rambur

94. Genus ***Diplacodes*** Kirby, 1889

260. *Diplacodes nebulosa* (Fabricius)
261. *Diplacodes trivialis* (Rambur)

95. Genus ***Indothemis*** Ris, 1911

262. *Indothemis limbata limbata* (Selys)
263. *Indothemis limbata sita* Campion
264. *Indothemis carnatica* (Fabricius)

96. Genus ***Crocothemis*** Brauer, 1868

265. *Crocothemis servilia servilia* (Drury)
266. *Crocothemis erythraea erythraea* (Brullé)

97. Genus ***Bradinopyga*** Kirby, 1893

267. *Bradinopyga geminata* (Rambur)

98. Genus ***Brachythemis*** Brauer, 1868

268. *Brachythemis contaminata* (Fabricius)

99. Genus ***Neurothemis*** Brauer, 1867

269. *Neurothemis fulvia* (Drury)
270. *Neurothemis fluctuans* (Fabricius)
271. *Neurothemis intermedia intermedia* (Rambur)
272. *Neurothemis intermedia degener* Selys
273. *Neurothemis intermedia atalanta* Ris
274. *Neurothemis tullia tullia* (Drury)

100. Genus ***Sympetrum*** Newman, 1833

275. *Sympetrum hypomelas* (Selys)
276. *Sympetrum orientale* (Selys)

101. Genus ***Rhodothemis*** Ris, 1911

277. *Rhodothemis rufa* (Rambur)

102. Genus ***Trithemis*** Brauer, 1868

278. *Trithemis aurora* (Burmeister)
279. *Trithemis festiva* (Rambur)
280. *Trithemis pallidinervis* (Kirby)

103. Genus ***Zygonyx*** Hagen, 1867

281. *Zygonyx iris iris* Selys

104. Genus ***Rhyothemis*** Hagen, 1867

282. *Rhyothemis variegata variegata* (Linnaeus)
283. *Rhyothemis plutonia* Selys
284. *Rhyothemis obsolescens* Kirby
285. *Rhyothemis triangularis* Kirby

105. Genus ***Onychothemis*** Brauer, 1868

286. *Onychothemis testacea ceylanica* (Ris)

106. Genus ***Zyxomma*** Rambur, 1842

287. *Zyxomma petiolatum* Rambur

107. Genus ***Tholymis*** Hagen, 1867

288. *Tholymis tillarga* (Fabricius)

108. Genus ***Pantala*** Hagen, 1861

289. *Pantala flavescens* (Fabricius)

109. Genus ***Pseudotramea*** Fraesr, 1920

290. *Pseudotramea prateri* Fraser

110. Genus ***Tramea*** Hagen, 1861

291. *Tramea basilaris burmeisteri* Kirby
292. *Tramea virginia* Rambur
293. *Tramea limbata similata* (Rambur)

111. Genus ***Camcinia*** Kirby, 1889

294. *Camacinia gigantea* (Brauer)

112. Genus ***Hydrobasileus*** Kirby

295. *Hydrobasileus croceus* (Brauer).

Order ODONATA

Key to the Suborders of ODONATA

Fore-and Hind wings are petiolated, or the base of the wings not markedly broad, closely similar to each other, discoidal cell four sided. ..... ZYGOPTERA

Fore-and Hind wings are not petiolated, broad at bases, dissimilar to each other, discoidal cell divided into superior or hypertriangle and inferior or triangle .... ANISOPTERA

Suborder ZYGOPTERA

Key to Superfamilies of Suborder ZYGOPTERA

1. Wings with two antenodals 2

— Wings with more than two antenodals .. .. CALOPTERYGOIDEA

2. The veins IR_3 and R_{4+5} nearer to node than to the arc..... COENAGRIONOIDEA

— The veins IR_3 and R_{4+5} neare to arc than to node ..... LESTOIDEA

Superfamily CALOPTERYGOIDEA

Distribution : Cosmopolitan

Key to Families of Superfamily CALOPTERYGOIDEA

1. Wings petiolate..... CHLOROCYPHIDAE

— Wings apetiolate or slightly petiolate.... 2

2. First thoracic suture complete .... CALOPTERYGIDAE

— First thoracic suture incomplete .... EUPHAEIDAE

Family CALOPTERYGIDAE

Distribution : Cosmopolitan

Key to Genera of Family CALOPTERYGIDAE

1. Arc oblique, median space entire .... *Vestalis* Selys

— Arc elongated, median space traversed 2

2. Pterostigma present .....*Echo* Selys

— Pterostigma absent or traversed by veins 3

3. Wings in both sexes opaque, pterostigma of female traversed ..... *Matrona* Selys

— Wings in both sexes hyaline, pterostigma of female not traversed .... *Neurobasis* Selys

Genus ***Neurobasis*** Selys

Neurobasis Selys, 1853, *Bull. Acad. Belg.* 20 Annexe. (Syn. Calopt.) p. 17; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 119; Lieftinck, 1954, *Treubia* **22** (Suppl.). **23** : Davies, 1981, *Synop. Ext. Gen. Odon.* p. 20.

Type-species : *Libellula chinensis* Linnaeus

Distribution : India, Nepal, Burma, China, Indo-China, Java, Malaya, Siam, Annam, Thailand, Yunnan, Sri Lanka, Philippines, Celebes.

Neurobasis chinensis chinensis (Linnaeus) (Figs. 20, 22)

Libellula chinensis Linnaeus 1758, *Syst. Nat.* **10** : 545; Edwards, 1750, *Nat. Hist. Birds* **3** : Fig. 112.

Agrion nobilata Fabricius, 1776. *Gen. Ins.* : 248. *Calopteryx chinensis* Rambur, 1842. *Ins. Nevrop.* p. 226.

Neurobasis chinensis Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 102. Ris, 1915, *Tijdschr. Ent.*, **58** : 6. Fraser, 1934, *Fauna Brit. India Odon.* **2** : 121-124; Lieftinck, 1954, *Treubia* **22** (suppl.) : 23.

Material examined: Arunachal Pradesh: Bhalukpong (32) 1♂, 23.iii. 1973; (28) 1♂, 27.x.1966; Subansiri (80) 1♂, 27.x.1966; 1♂, 1♀, 28.x.1966. Tirap (285a) 1♂, 28.x.1971;

Assam; Barpeta (3) 8♂, 2♀, 4.iii.1986; 2♂, 3♀, 6.iv.1986; 1♂, 7.iv.1986; Manipur : Morch West (204) 5♀, 24.iii.1975; Mizoram : Blue mountain (38c) 1♂, 1♀, 17.i.1987; Nagaland : Zunheboto. 1♂, 25.vii.1991 (Deposited in the Eastern Regional Station, Zoological Survey of India, Shillong). Orissa : Bolangir (38b) 1♂, 8.xi.1983; Kotagarh (171) 1♀, 23.v.1972; 3♂, 3♀, 24.v.1972; Mayurbhanj (194) 1♀, 21.iii.1973.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Mizoram Nagaland and Orissa. *Past records* : INDIA : *Eastern India* : Sadiya, N.E. Assam, Dejoo, North Lakhimpur (Laidlaw 1914); Bengal, Assam (Fraser 1929b); Manipur (Lahiri 1977b); Mizoram (Lahiri 1979); Singhbhum (Bhasin 1953). *Northern India* : Uttar Pradesh (Kumar 1982); Dehra-Dun Lachiwala, Nainital, Bhimtal (Bhasin 1953); Garhwal Hills (Prasad 1974); *Southern India* : Coorg, Deccan, South Kanara, Malabar, Palni Hills, (Fraser 1934b); Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palni Hills, Travancore (Fraser 1931a); Silent Valley (Rao & Lahiri 1983). *Western India* : Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma (Bhasin 1953, Fraser 1929b; Laidlaw 1914; Selys 1891); Indo-China (Lieftinck 1971); Nepal (Asahina 1955 Kiauta & Kiauta 1982a; St. Quentin 1970); Thailand (Kiauta & Kiauta 1983b); Yunnan (Moore 1878); China, Philippines, Celebes (Selys 1891); Bangladesh, Hong Kong, Laos, Indonesia, Malayasia, Ceylon, Vietnam (Tsuda 1991).

Intraspecific variation : The specimens from Arunachal Pradesh, Assam and Manipur differ from the specimens from Orissa as well as from Fraser's (1934b) description since the males of first three states have dirty white labium and that of females bluish-yellow. One male from eastern Ghats (Andhra Pradesh) differs from the specimens under study due to its greenish white labium and whitish labrum.

Genus *Vestalis* Selys

Vestalis Selys, 1853, *Bull. Acad. Belg.* 20 Annexe. (*Syn. Calopt.*) : 24 : Fraser, 1934, *Fauna Brit. India Odonata*, **2** : 124; Lieftinck 1954, *Treubia*, **22** (suppl.) : 21; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 21.

Type-species : *Calopteryx luctuosa* Burmeister

Distribution : Throughout the Oriental Region; Sundaic Archipelago; Phillipines.

Key to Species of Genus *Vestalis* Selys

1. Apex of wings black .... *apicalis apicalis* Selys
— Wings hyalin or tinted variably 2
2. Wings tinted with golden yellow thoroughout the length..... ..... *smaragdina smaragdina* Selys
— Wings hyaline or partly tinted .... *gracilis gracilis* (Rambur)

Vestalis gracilis gracilis (Rambur) (Figs. 15, 16)

Calopteryx gracilis Rambur, 1842, *Ins. Nevrop.* p. 224. *Vestalis gracilis* Selys & Hagen 1854, *Mem. Soc. Sci. Liege* 9 : 84. *Vestalis gracilis gracilis* Fraser, 1934, *Fauna Brit. India Odon.* **2** : 126-128; Lieftinck, 1954, *Treubia*, **22** (suppl.) : 22

Material examined : Arunachal Pradesh : Deban north (84) 2♂ 28.iv.1981; Nr. Labal (173) 1♀ 28.iv.1981; Assam : Goalpara (132) 1♂, 6.vi.1973; Silchar (264) 1♀, 5.xii.1983; Manipur : Morch (204) 1♂, 24.xi.1983; Tripura : Manu : (133) 1♀, 25.x.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur and Tripura. *Past records* : INDIA : *Eastern India* : Abor Hills, Sibsagar, Gopaldhara (Laidlaw 1917a); North Lakhimpur, Upper Assam (Laidlaw 1914); Singhbhum (Bhasin 1953); Arunachal Pradesh (Lahiri 1985); *Southern India* : Western Ghats (Fraser 1924b); Eastern Ghats (Fraser 1929b) Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Travancore (Fraser 1931a); Andamans (Lahiri 1998). *Central India* : Bastar, Madhya Pradesh (Prasad 1996a). *Western India* : Goa (Prasad 1995).

Elsewhere : ASIA : Annam, Tonkin (Fraser 1929b); Burma (Selys 1891, Laidlaw 1914, 1917a); Thailand (Kiauta & Kiauta 1983b; Titayavan 1979); Thibet (Selys 1891); Yunnan (Moore 1878). Bangladesh, Kampuchea, Laos, Malayasia, Nepal, Vietnam (Tsuda 1991).

Remark : An addition to the fauna of Manipur and Tripura.

Vestalis apicalis apicalis Selys
(Figs. 17, 18)

Vestalis apicalis Selys, 1873, *Bull. Acad. Belg.* (2) **36** : 612. *Neurobasis apicalis* Kirby, 1891, *Proc. Zool. Soc. Lond.* p. 204. *Vestalis apicalis apicalis* Fraser, 1934, *Fauna Brit. India Odon.* **2** : 128-130.

Material examined : Orissa : Kotagarh (171) 1♂, 1♀, 24.v.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1934b). *Southern India* : Western and Eastern Ghats (Fraser 1934b); Nilgiris (Bhasin 1953); Silent Valley (Rao & Lahiri 1983).

Remark : A new record from Orissa (Mitra 2000)

Intraspecific variation : The specimen varies from the description present in the Fauna of British India due to having brown colouration in the labium, labrum, cheeks, face, frons and bases of antennae as well as lateral and antehumeral suture of thorax.

Vestalis smaragdina smaragdina Selys
(Figs. 19)

Vestalis smaragdina Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 362, Fraser 1934, *Fauna Brit. India Odon* **2** : 133-134.

Material examined : Tripura : Belonia (20) 1♂, 2.x.1977

Distribution : *Present record* : Tripura. *Past records* : INDIA : *Eastern India* : Assam, Khasia Hills, Shillong (Fraser 1929b). *Central India* : Indravati Tiger Reserve (Mitra 1995b).

Elsewhere : ASIA : Burma (Laidlaw 1917a; Lieftinck 1948, Selys 1891); Moupin (Mc Lachlan 1896a); China; Formosa (Needham 1930); Tibet (Fraser 1929b; 1934b; Lieftinck 1948).

Remark : A new record from Tripura (Mitra 1994).

Genus *Echo* Selys

Echo Selys, 1853, *Bull. Acad. Belg.* 20 (Annese) *Syn. Calopt.* p. 19 Fraser, 1934, *Fauna Brit. India Odon.* **2** : 134; Lieftinck, 1954, *Treubia* **22** (suppl) : 20 : Davies 1981, *Synop. Ext. Gen. Odon.* p. 20.

Type-species : *Echo margarita* Selys

Distribution : India, Burma, Malayasia.

Echo margarita margarita Selys

Echo margarita Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.* p. 19; Fraser 1934, *Fauna Brit. India Odon.* **2** : 136-137.

Material examined : Arunachal Pradesh : Tirap (285a)1♀, 4.xi.1971; 1♀, 7.xi.1971; Manipur : Morch West (204) 3♀, 24.ix.1975. Nagaland : Zunheboto, 1♂, 25.vii.1991 (Deposited Eastern Regional Station, Zoological Survey of India, Shillong)

Distribution : *Present records* : Arunachal Pradesh and Manipur, Nagaland. *Past records* : INDIA : *Eastern India* : Cherrapunji, Khasia Hills (Laidlaw 1917a; Fraser 1929b; 1934b).

Remark : A new record from Arunachal Pradesh and Manipur (Mitra 1994).

Genus *Matrona* Selys

Matrona Selys, 1853, *Bull. Acad. Belg.* 20 (Annex) *Syn. Calopt.* p. 17. Fraser, 1934, *Fauna Brit. India Odon.* 2 : 144; Davies, 1981, *Syn. Ext. Gen. Odon.* p. 20.

Type-species : *Matrona basilaris* Selys

Distribution : India, Bangladesh, Burma, Tibet, China, Formosa, Yunnan, Japan, Thailand, Vietnam.

Matrona basilaris Selys

Matrona basilaris Selys, 1853, *Bull. Acad. Belg.* (Annexe) *Syn. Calopt.* p. 17. Fraser, 1934, *Fauna Brit. India Odon.* 2 : 145-146.

Key to subspecies of *Matrona basilaris* Selys

Ventral surface of the thorax black .... *b. nigripectus* Selys

Ventral surface of the thorax yellow .... *b. basilaris* Selys

Matrona basilaris basilaris Selys

Matrona basilaris Selys, 1853, *Bull. Acad. Belg.* (Annexe) *Syn. Calopt.* p. 17.

Matrona basilaris basilaris Fraser, 1934, *Fauna Brit. India. Odon.* **2** : 145-146.

Material examined: Arunachal Pradesh: Siang (76) 1♂, 10.x.1966; (44) 3♂, 31.x.1966; (151) 1♀, 15.x.1966.

Distribution: *Present record*: Arunachal Pradesh. *Past records*: INDIA: *Eastern India*: Shillong (Fraser 1919a); Khasia Hills (Selys 1891); Cherrapunji (Laidlaw 1917a).

Elsewhere: ASIA: Bangladesh (Fraser 1929b; 1934b); Burma (Fraser 1929b; 1934b); Chin Hills, Hainan, Tonkin (Fraser 1929b; 1934b) Puepoli, Leito, (Selys 1891); China (Needham 1930); Formosa, (Fraser 1929b, 1934b; Needham 1930), Sanghai, Tibet (Fraser 1929b; 1934b), Yunnan (Moore 1878); Hainan, Japan, Ryuku Island (Lieftinck *et.al.* 1984).

Remark: A new record from Arunachal Pradesh (Mitra 1994).

Intraspecific variation: The specimens vary from Fraser's (1934b) description because of the possession of dull black labium in male, blackish brown anal appendages in female.

Matrona basilaris nigripectus Selys (Fig. 24)

Matrona basilaris race nigripectus Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 355.

Matrona basilaris nigripectus Fraser, 1934, *Fauna Brit. India Odon.* **2** : 147.

Material examined: Arunachal Pradesh: Tirap (285a) 1♂, 5.xi.1971; 2♀, 7.xi.1971, Mizoram: Phaileng (228a) 1♂, 23.x.1991.

Distribution: *Present records*: Arunachal Pradesh and Mizoram. *Past records*: INDIA: *Eastern India*: Khasia Hills (Fraser 1929b; 1934b).

Outside India: ASIA: Burma (Fraser 1929b; 1934b).

Remark: New record from Arunachal Pradesh and Mizoram (Mitra 1994).

Family EUPHAEIDAE

Distribution: India, Nepal, Pakistan, Burma, Sri Lanka, Thailand, Vietnam, Malaysia, Indonesia, New Guinea, Ryuku, Taiwan, Philippines, Israel, Europe.

Key to Genera of Family EUPHAEIDAE

1. Petiolation of wings present 2

— Petiolation of wings almost absent .... *Euphaea* Selys

2. R_{2+3} fused with R_1 near its origin .... *Bayadera* Selys

— R_{2+3} not fused with R_1 near its origin..... .....*Anisopleura* Selys

Genus *Bayadera* Selys

Epallage Group *Bayadera* Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.*: 49.

Bayadera Selys, 1854, *Mon. Cal.* p. 162; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 78; Davies, 1981, *Synop, Ext. Gen. Odon.* p. 23.

Type-species: *Epallage indica* Selys

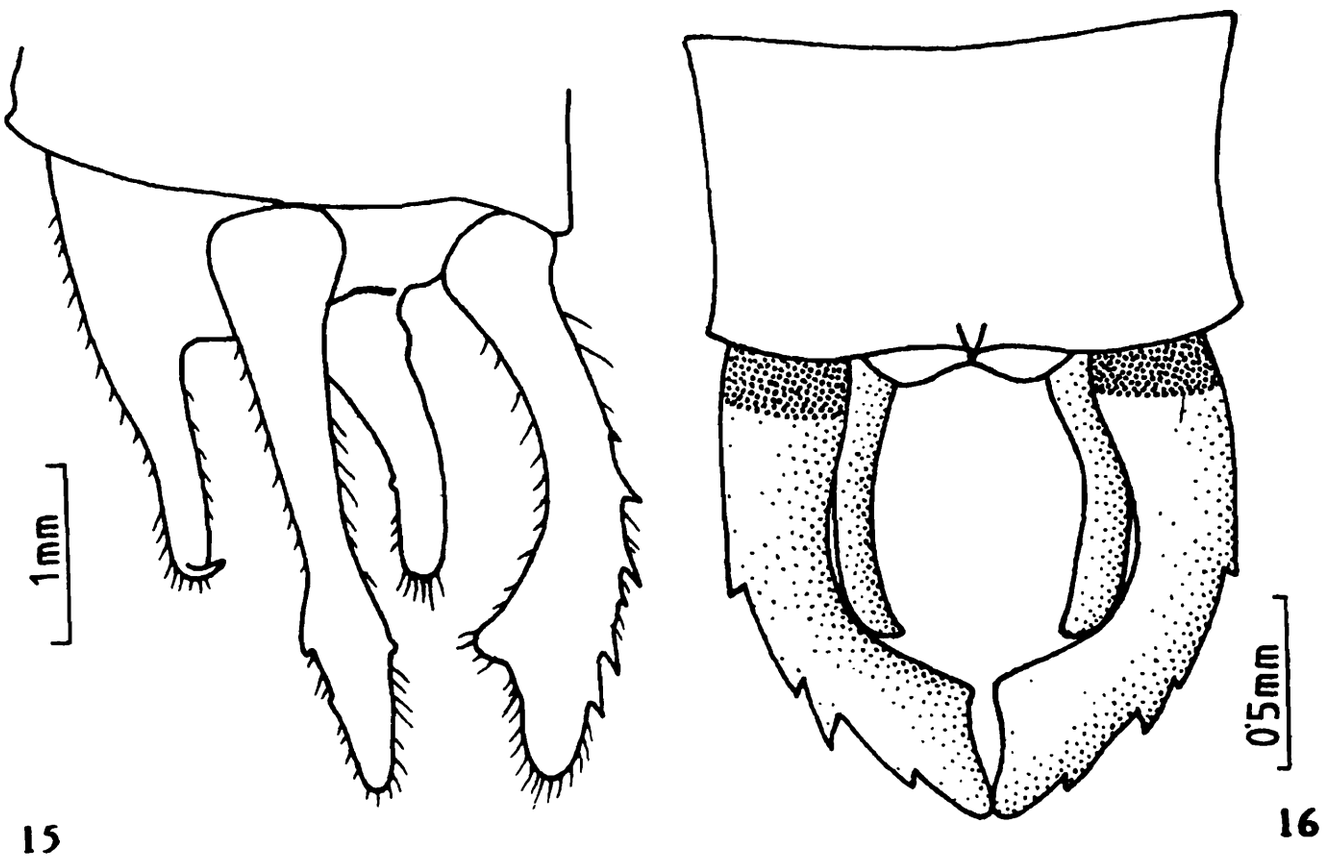
Distribution: India, Nepal, Burma, China, Ryuku, Taiwan.

Bayadera indica (Selys) (Figs. 25)

Epallage indica Selys, 1853, *Bull. Acad. Belg.* 20 (Annex) *Syn. Calopt.* p. 49

Bayadera indica Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 108; *Fraser*, 1934, *Fauna Brit. India Odon.* 2 : 79-81.

Material examined: Sikkim: Mongan (188) 1♀, 12.iv.1981; Rangpo (244) 2♂, 7.iv.1981; West Bengal: Darjeeling (198) 1♀, 17.vii.1976; (245) 1♂, 19.iv.1976; (281) 1♂, 20.iv.1976.



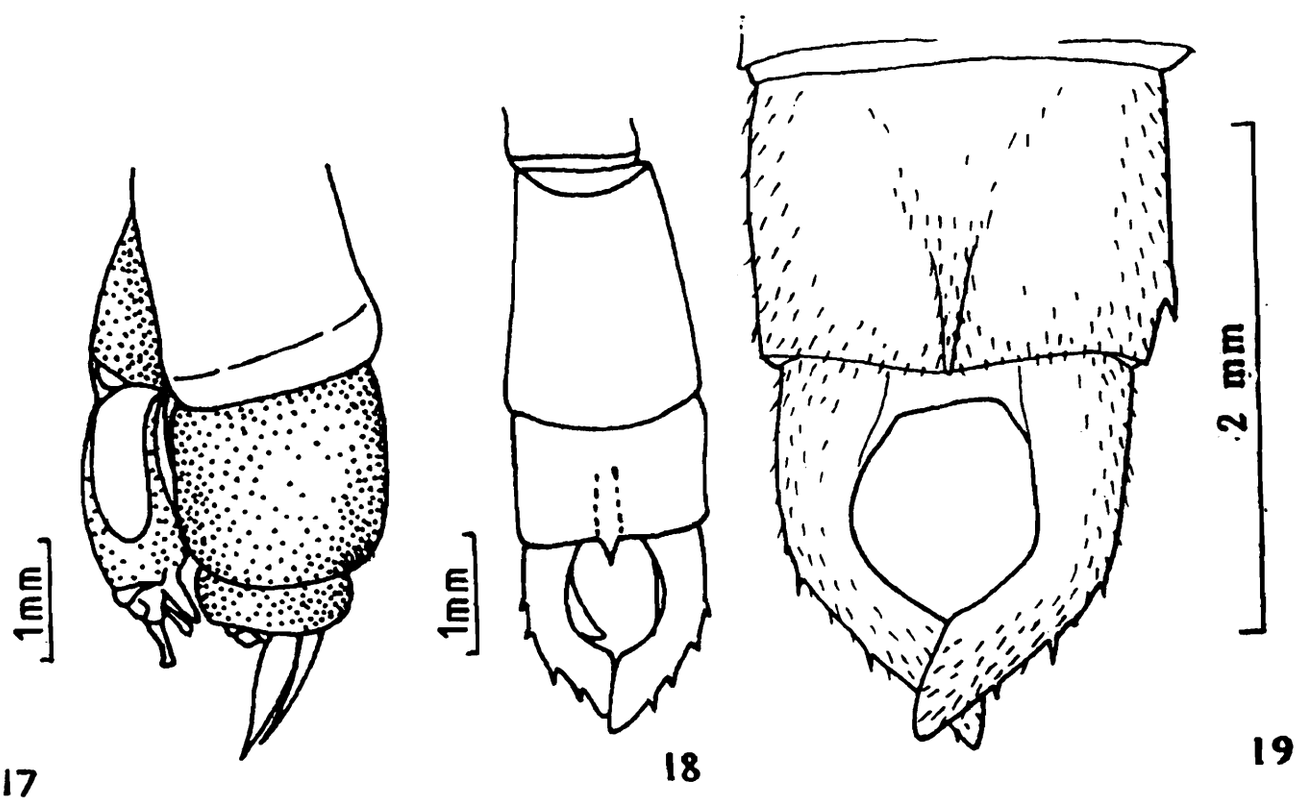


Fig. 15-19. 15. Anal appeandages and part of 10th abdominal segment of male *Vestalis g. gracilis* (Rambur) (Left lateral view); 16. Same (dorsal view); 17. End segments of the abdomen showing anal appendages and female genitalia of *Vestalis a. apicalis* Selys (Left lateral view); 18. End segments of the abdomen and anal appendages of the same male (dorsal view); 19. 10th abdominal segment and anal appendages of *Vestalis s.* smaragdina Selys (Dorsal view)

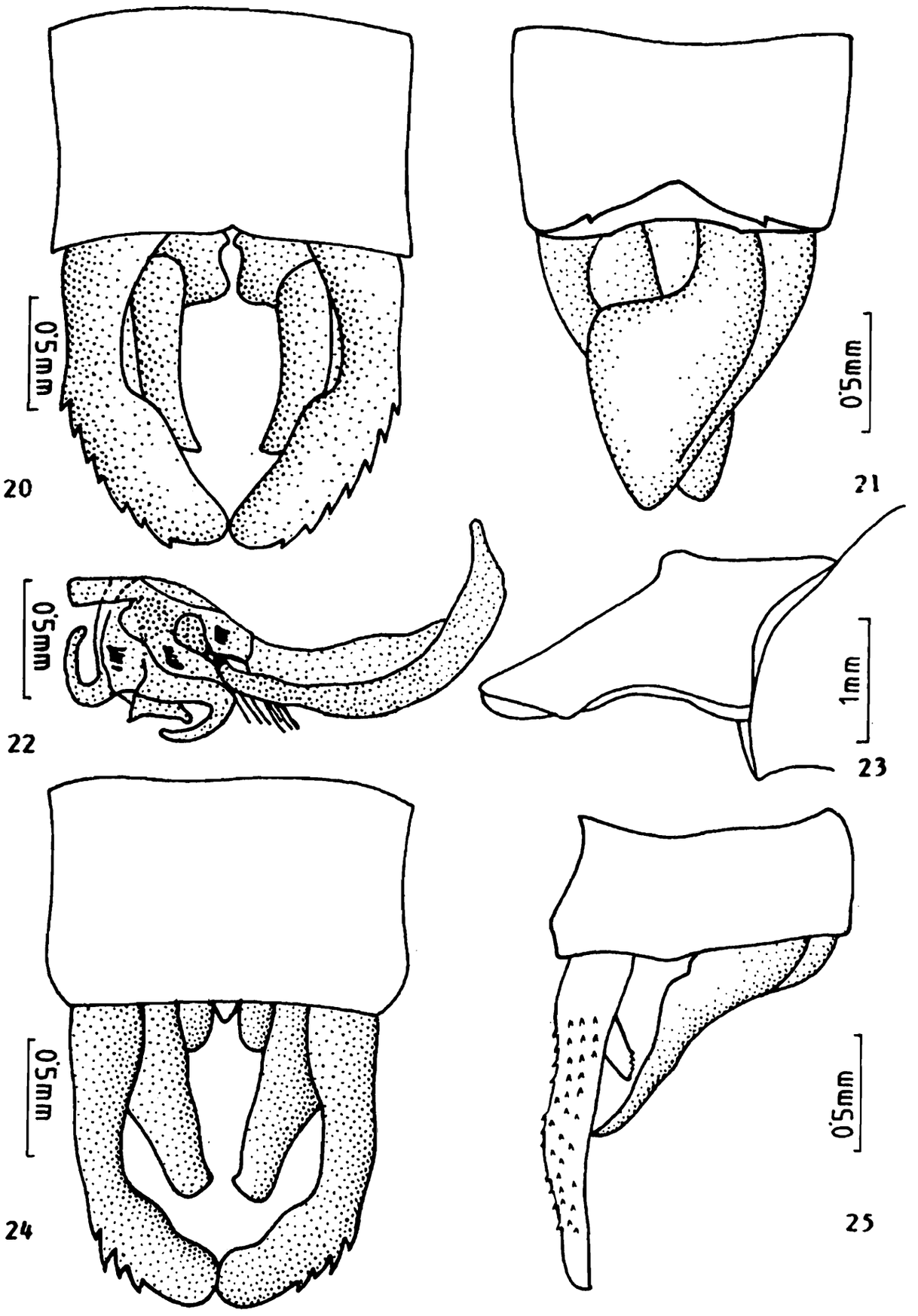


Fig. 20-25. 20. 10th abdominal segment and anal appendages of male *Neurobasis c. chinensis* (L.) (Dorsal view); 21. 10th abdominal segment and anal appendages of male *Anisopleura subplatystyla* Fraser (Dorsal view); 22. Penis of *Neurobasis c. chinensis;* 23. Anal appendages of male *Anisopleura subplatystyla* (Left latera view); 24. 10th abdominal segment and anal appendages of male *Matrona basilaris nigripectus* Selys (Dorsal view); 25. 10th abdominal segment and anal appendages of *Bayadera indica* (Selys) (Right lateral view); male

Distribution : *Present records* : Sikkim and West Bengal

Past records : INDIA : *Eastern India* : Darjeeling (Laidlaw 1917a; St. Quentin 1936) : N.E. India, N. Bengal (Fraser 1928c) Sikkim (Prasad & Ghosh 1984b); Arunachal Pradesh (Prasad 1997b). *Northern India* : Almora, Raniket, Dehra Dun, Kaligad (Bhasin 1953); Chamoli, Pauri, Garhwal, Tehri, Uttar Kashi, Kangra (Singh & Prasad 1974).

Elsewhere : ASIA : Nepal (Kiauta 1975, St. Quentin 1970) Bangladesh, China (Tsuda 1991).

Intraspecific variations : In the specimens from Sikkim 25 antenodals and 23 post nodals in the forewing; 21 antenodals and 22 post nodals in the hindwings.

Genus ***Anisopleura*** Selys

Anisopleura Selys, 1853, *Syn. Cal.* p. 48; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 84; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 23.

Type-species : *Anisopleura lestoides* Selys.

Distribution : East Palearctic and Oriental region.

Key to Species of Genus *Anisopleura* Selys

Superior anal appendages without spine .... *comes* Selys

Superior anal appendages with short spine near base ..... *subplatystyla* Fraser

Anisopleura comes Selys
(Figs. 23a)

Anisopleura comes Selys, 1880, *C.R. Soc. Ent. Belg.* **23** : 43; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 87-89.

Material examined : Nagaland : Zunheboto, 1♂ 1♀, (Deposited in ERS, ZSI, Shillong). West Bengal : Darjeeling (36) 1♂, 20.v.1974. Sikkim : Mongan, 1♂, 23.xi.1991 (Collection present in Gangetic plain Research Station, Zoological Survey of India, Patna, Bihar).

Distribution : *Present records* : Nagaland, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Gopaldhara, Darjeeling, Assam (Fraser 1928c; 1934b; Laidlaw 1917a); Sikkim (Fraser 1934b); Mizoram (Prasad 1997c). *Northern India* : Uttar Pradesh (Kumar 1982); Dehra Dun, Mussorie, Chakrata, Kempti falls (Bhasin 1953); Kumaon (Laidlaw 1917a); Punjab Himalaya (Fraser 1934b); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Nepal (Asahina 1955; Kiauta & Kiauta 1982a). Bangladesh, China (Tsuda 1991).

Anisopleura subplatystyla Fraser
(Figs. 21, 23)

Anisopleura subplatystyla Fraser, 1927, *Rec. Indian Mus.* 29 : 81; Fraser, 1934, *Fauna Brit. India Odon.* **1** : 89-91.

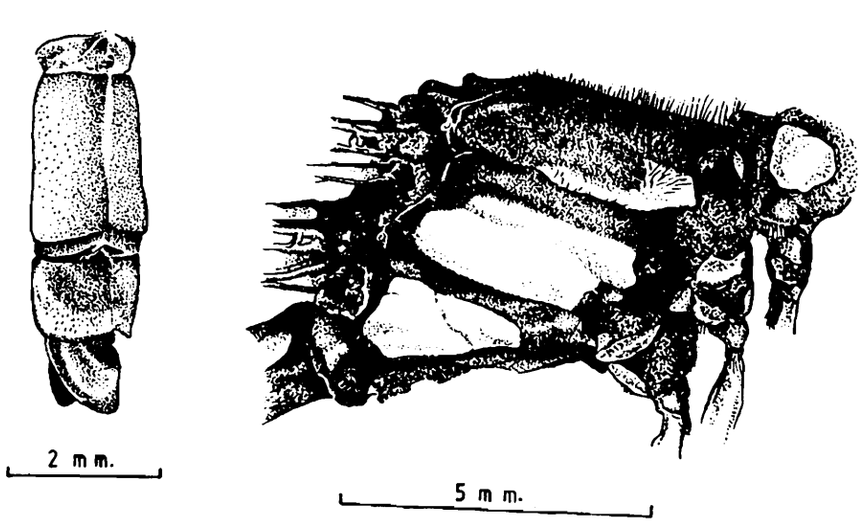


Fig. 23a. Lateral side of prothorx and thorax, dorsolateral view of anal appendages of *Anisopleura comes* (Selys).

Material examined: Sikkim: Tumin (287a) 2♂, 23.ix.1988.

Distribution: *Present records*: Sikkim. *Past records*: INDIA: *Eastern India*: Assam, Shillong (Fraser 1934b).

Remark: New record from Sikkim (Mitra 1994).

Genus *Euphaea* Selys

Euphaea Selys, 1840, *Mon. Lib. Eur.* p. 200; Cowley, 1934, *Ent. mon. Mag.* **70**: 242; Lieftinck, 1954, *Treubia* **22** (suppl.) : 15.

Allophaea Fraser, 1920, *J. Bombay nat. Hist. Soc.* **33** : 288; 1934, *Fauna Brit. India, Odon.* **2** : 95.

Type-species: *Euphaea variegata* Rambur

Distribution: India, Burma, China, Thailand, Vietnam, Indonesia, Malaysia, Sri Lanka.

Key to Species of Genus *Euphaea* Selys

Origin of R_3 in continuation of the subnode ..... *ochracea ochracea* Selys

Origin of R_3 proximal to the subnode..... ..... *guerini masoni* Selys

Origin of R_3 distal to the subnode..... ..... *cardinalis* (Fraser)

Euphaea ochracea ochracea Selys (Fig. 27)

Euphaea ochracea Selys, 1859, *Bull. Acad. Belg.* (2) **7** : 443. *Allophaea ochracea* Fraser, 1934, *Fauna Brit. India, Odon.* 2 : 96-98.

Euphaea ochracea ochracea Laidlaw, 1931, *J.F. Malay States* **16** : 180, Lieftinck, 1954, *Treubia* **22** (suppl.) : 17.

Material examined: Arunachal Pradesh: Tirap (285a) 1♂, 27.x.1971; 1♂, 28.x.1971; 1♂, 27.xi.1971; Manipur: Morch west (204) 1♂, 5♀, 27.ix.1975; West Bengal: Darjeeling (245) 1♀, 10.iv.1975; (226) 9♂, 4♀, 14.viii.1978.

Distribution: *Present records*: Arunachal Pradesh, Manipur, West Bengal. *Past records*: INDIA: *Eastern India*: Assam, Cachar, Shillong (Fraser 1929a); Mizoram (Prasad 1997c).

Elsewhere: ASIA: Malaya Peninsula (Laidlaw 1917a); Burma, Malacca, Siam, French-Indo-China, Annam, (Fraser 1929a). Malayasia (Lieftinck 1954); Nepal, Thailand (Tsuda 1991).

Remark: A new record from Arunachal Pradesh; Manipur and West Bengal (Mitra 1994).

Intraspecific variations: The male specimens from Darjeeling differ from specimens of Arunachal Pradesh, Manipur and Fraser's (1934b) description in having thoracic marking dull ochreous.

Euphaea guerini masoni Selys (Fig. 26)

Euphaea masoni Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 377; Lieftinck, 1954, *Treubia* **22** (suppl.) : 17.

Pseudaphaea masoni Fraser, 1934, *Fauna Brit. India Odon* 2 : 102-103.

Euphaea guerini masoni, Tsuda, 1991, *A distributional list of World Odonata, 1991* p. 81.

Material examined: Manipur: Burma border East (147) 1♂, 21.ix.1975; Morch west (204) 5♂, 27.ix.1975.

Distribution: *Present record*: Manipur. *Past records*: INDIA: *Eastern India*: Naga Hills (Bhasin 1953; Fraser 1929a).

Elsewhere: ASIA: Burma (Fraser 1929a); Tonkin (Laidlaw 1917a) Bangkok, Siam (Fraser 1934b).

Euphaea cardinalis (Fraser)

Pseudaphaea cardinalis Fraser, 1924, *Rec. Indian Mus.* **26** : 512.

Indophaea cardinalis Fraser, 1934, *Fauna Brit. India Odon.* **2** :

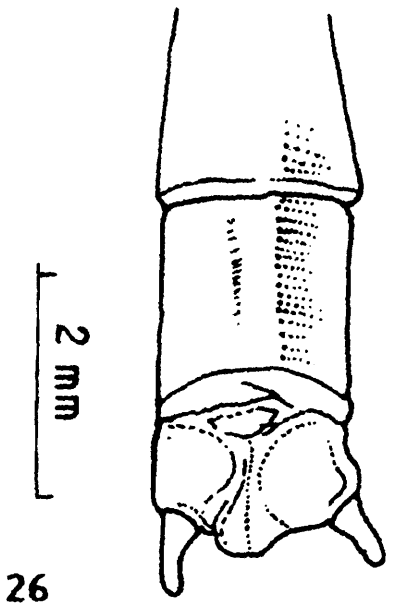
Material examined: Assam: Sangsok (254) 1♂, 6.v.1979

Distribution: *Present record*: Assam. *Past records*: INDIA: *Southern India*: Western Ghats, South India (Fraser 1934b).

Remark: A new record from eastern India (Mitra 1994).

Family CHLOROCYPHIDAE

Distribution: Africa, Asia.



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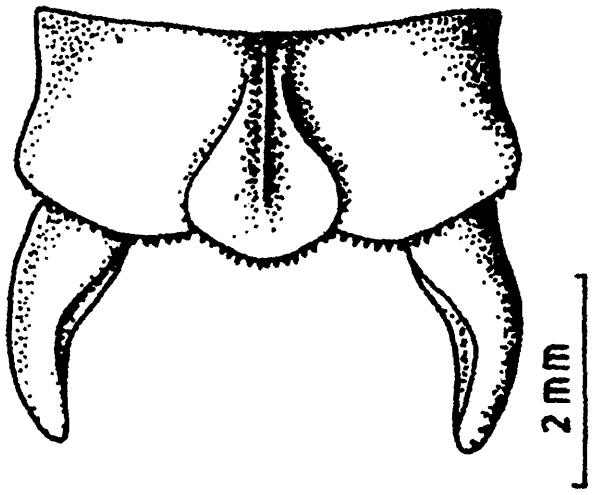

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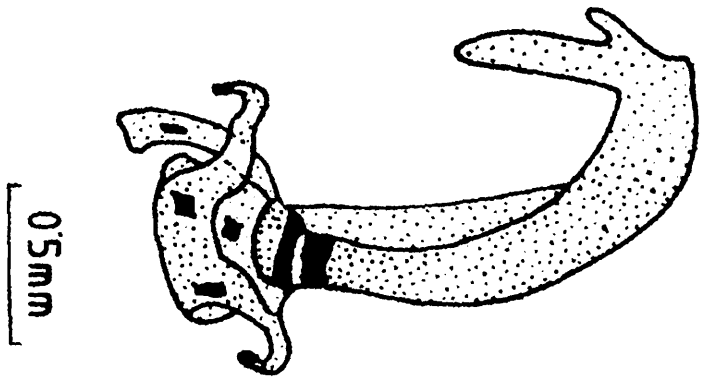

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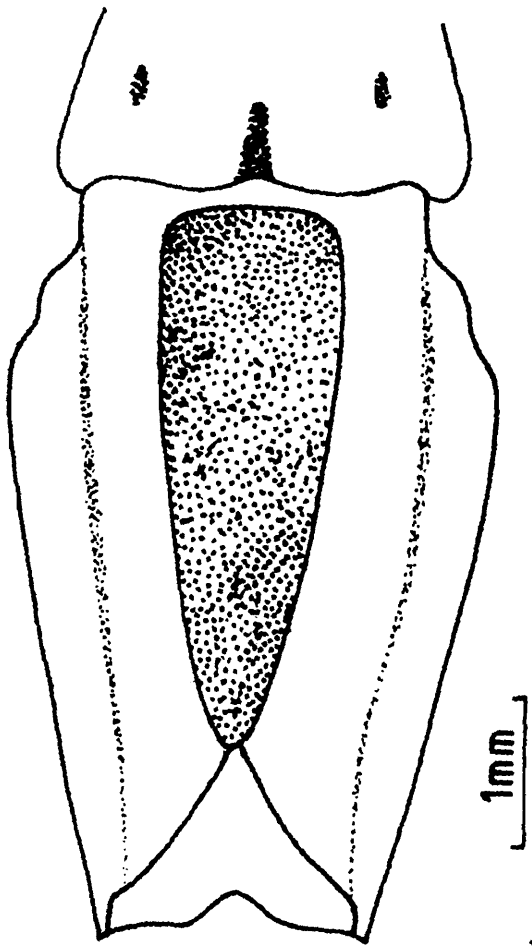

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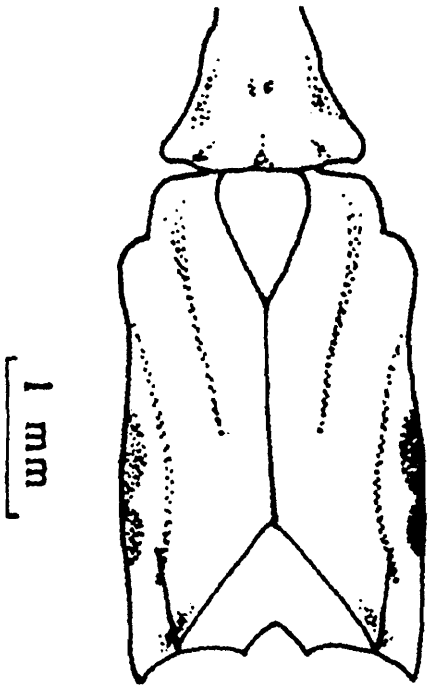

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Fig. 26-30. 26. 10th abdominal segment and anal appendages of male *Euphaea guerini masoni* Selys (Dorsal view); 27. 10th abdominal segment and anal appendages of male *Euphaea o. ochracea* Selys (Dorsal view); 28. Penis of *Rhinocypha immaculata* Selys; 29. Thorax of male *Rhinocypha ignipennis* Selys showing the mesothoracic triangle; 30. Thorax of male *Rhinocypha immaculata* Selys showing the mesothoracic triangle.

Key to Genera of Family CHLOROCYPHIDAE

Sectors of arc arising from a common point ..... *Libellago* Selys

Sectors of arc divergent at origin ..... *Rhinocypha* Rambur

Genus *Libellago* Selys

Libellago Selys, 1840, *Mon. Lib. Eur.* p. 200; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 58; Cowley, 1934, *Ent. mon. Mag.* 70 : Lieftinck, 1954, *Treubia* **22** (suppl.) : 2 : Davies, 1981, *Synop, Ext. Gen. Odon.* p. 22.

Type-species : *Calopteryx lineata* Burmeister

Distribution : Southern Asia, from western India to Malayasia, New Guinea and Ceylon.

Libellago lineata lineata (Burmeister) (Fig. 35)

Calopteryx lineata Burmeister, 1839, *Handb. Ent.* **2** : 826.

Libellago lineata Selys, 1840, *Mon. Lib. Eur.* p. 200.

Libellago lineata lineata Fraser, 1934, *Fauna Brit. India Odon.* **2** : 60-63; Lieftinck, 1954, *Treubia* **22** (suppl.) : 3.

Material examined : Manipur : Morch West 1♀, 25.ix.1975; 2♀, 27.ix.1975; Tripura : Agartala (232) 1♂, 29.x.1974; Udaipur (289a) 6♂, 6♀, 7.xi.1974; 1♂, 5.xi.1974.

Distribution : *Present records* : Manipur and Tripura. *Past records* : INDIA : *Eastern India* : Gopaldhara, Assam (Laidlaw 1917a); Cachar, Assam (Fraser 1928b, 1934b). Arunachal Pradesh (Prasad 1997b). *Northern India* : Dehra Dun (Fraser 1928b; 1934b); Rajasthan (Prasad & Thakur 1981). Nicobar Islands (Laidlaw 1917a). *Central India :* Bastar (Prasad 1996a).

Elsewhere : ASIA : Burma, Java (Fraser 1928b, 1934b, Selys 1891); Formosa (Needham 1930); Borneo, Taiwan (Lieftinck *et. al.* 1984); China, Laos, Nepal, Philippines, Thailand, Vietnam (Tsuda 1991)

Remark : New record from Manipur and Tripura (Mitra 1994).

Genus *Rhinocypha* Rambur

Rhinocypha Rambur, 1842, *Ins. Nevrop.* p. 232; Fraser 1934, *Fauna Brit. India Odon.* **2** : 5; Lieftinck, 1954, *Treubia* **22** (suppl.) 7 : Davies, 1981, *Synop. Ext. Gen. Odon.* p. 22.

Type-species : *Rhinocypha tincta* Rambur

Distribution : Oriental and Australian Region.

Key to Species of Genus *Rhinocypha* Rambur

Male

1. Wings uncoloured ..... *immaculata* Selys
– Wings coloured at least partly 2
2. Mesothoracic triangle obsolete ..... *unimaculata* Selys
– Mesothoracic trinangle conspicuous 3
3. Mesothoracic triangle extending up to the root of the wings 4
– Mesothoracic triangle not extending up to the root of the wings ..... *bisignata* Selys
4. Hind wings with opaque bands 5
– Hind wings with vitreous spots 7
5. Hindwings traversed by two brown bands from costa to the hind border ..... *bifasciata* Selys
– Hind wings traversed by three brown bands from costa to the hind border 6
6. The innermost band does not reach the node ..... *trifasciata* Selys
– The innermost band terminates at the node ..... *bifenestrata* Fraser
7. Opaque area covers roughly half of the forewing ..... *cuneata* Selys
– Opaque or semiopaque area covers more than half of the forewing 8
8. Semi-opaque from node to apices ..... *ignipennis* Selys
– Opaque area begins before the node and extends upto the apices 9
9. Vitreous spot in the hindwing at the level of the pterostigma, small 10
– Vitreous spot in the hindwing at the level of the pterostigma, large ..... *quadrimaculata* Selys
10. Abdomen more than 20 mm ..... *spuria* Selys

- Abdomen less than 20 mm..... .....*fenestrella* Rambur

Female

1. Wings hyaline ..... *immaculata* Selys
- Wings enfumed 2
2. Blue at the center of black pterostigma .. ..*cuneata* Selys
- Ochreous at the center of black pterostigma ..... *spuria* Selys
- Yellow at the the outer part of the black pterostigma 3
- Yellow at the center of the black pterostigma 4
3. Abdomen 17-18 mm ..... *bifasciata* Selys
- Abdomen 20-21 mm .....*bifenestrata* Fraser
- Abdomen 22-23 mm ..... *trifasciata* Selys
4. Yellow colour at the center of the pterostigma faint ..... *quadrimaculata* Selys
- Yellow at the center of the pterostigma distinct .....*fenestrella* Rambur

N.B. Females of *Rhinocypha unimaculata* Selys and *Rhinocypha bisignata* Selys can be identified with the aid of key for males.

Rhinocypha cuneata Selys

Rhinocypha cuneata Selys, 1853, *Bull. Acad. Belg. (syn. Calopt.)* 20; p. 60; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 9-12.

Material examined: Arunachal Pradesh : Bhalukpong (32) 4♂, 1♀, 23.iii.1973; Siang (280) 1♂, 23.x.1966; (76) 1♂, 10.x.1966; Subansiri (273) 1♂, 23.x.1966.

Distribution : *Present record*: Arunachal Pradesh. *Past records* : INDIA : *Eastern India* : gopaldhara, Darjeeling (Laidlaw 1917a); Turzum, Mungpoo, Darjeeling, Assam (Fraser 1927a); Arunachal Pradesh (Lahiri 1977a, 1979). Sikkim (Prasad & Varshney 1995).

Elsewhere : ASIA : China (Chao 1981; Needham 1930); Thibet (Fraser 1927a) Yunnan (Moore 1878).

Intraspecific variation : The specimens very from Fraser's (1934b) description in having obscure pale blue spot on labrum and brownish black thorax in male; while in female the spot in front of anterior ocellus very small.

Rhinocypha ignipennis Selys
(Fig. 29)

Rhinocypha ignipennis Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 389-390; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 23-24.

Material examined: Arunachal Pradesh : 2♀ ♀(Kameng & Subansiri). West Bengal : Darjeeling (244) 1♂, 15.v.1967.

Distribution : *Present record* : Arunachal Pradesh, West Bengal. *Past records* : INDIA : *Eastern India* : Shillong (Fraser 1934b) Arunachal Pradesh (Ram & Prasad 1999).

Elsewhere : ASIA : Burma (Fraser 1934b); Bangladesh (Tsuda 1919).

Rhinocypha spuria Selys

Rhinocypha spuria Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 388, Fraser, 1934, *Fauna Brit. India Odon* **2** : 12-14.

Material examined : Assam : Goalpara (132) 1♀, 2.vi.1973; 1♀, 5.vi.1973; Mizoram : Phaileng (228a) 1♀, 23.x.1991; Terei (231b) 1♂, 25.x.1991.

Distribution : *Present records* : Assam and Mizorams. *Past records* : INDIA : *Eastern India* : Khasia Hills (Laidlaw 1917a); Shillong (Fraser 1927a; 1934b); Nagaland (Bhasin 1953).

Elsewhere : ASIA : Burma (Fraser 1927a, 1934b).

Remark : A new record from Assam and Mizoram (Mitra 1994).

Rhinocypha quadrimaculata Selys
(Figs. 31, 32)

Rhinocypha quadrimaculata Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.* p. 60; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 14-17.

Material examined: Arunachal Pradesh : Daphabum (293) 1♂, 3.xii.1969 : Namdhapa

(211a) 1♂, 2.vi.1981; Assam : Goalpara (132) 2♂, 2.vi.1973; 1♀, 3.vi.1973; Manipur : Morch west (204) 1♂, 1♀, 24.ii.1975; Orissa : Kotagarh (171) 3♀, 4.v.1972; 2♀, 5.v.1972; West Bengal : Darjeeling (246a) 4♀, 30.iii.1973; 1♂, 4.vi.1973; (245) 1♀, 7.iv.1973; 2♂, 8.iv.1973; 1♂, 3♀, 9.iv.1973; 1♀, 10.iv.1973; (266) 1♂, 13.iv.1973; (116) 5♂, 18.iv.1973; (155) 4♂, 1♀, 19.iv.1973; (246a) 3♂, 1♀, 30.xi.1973.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh (Lahiri 1985); Dejoo, North Lakhimpur, Siloni Bari, Upper Assam (Laidlaw 1914); Sikkim (Fraser 1934b); Buxa (Bhasin 1953); Darjeeling (Chatterjee & Kiauta 1973); Meghalaya (Lahiri 1987). *Northern India* : Kashmir, Dehra Dun (Fraser 1934b); Almora, Mothronwala, Ramgarh (Bhasin 1953); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Burma (Fraser 1927a; 1934b); Tennaserim (Lieftinck 1948); Nepal (Kiauta & Kiauta 1982a, St. Quentin 1970). Thailand (Titayavan 1979); Bangladesh (Tsuda 1991).

Remark : A new record from Manipur and Orissa (Mitra 1994).

Intraspecific variation : The intensity of colour of the mesothoracic triangle in specimens from Arunachal Pradesh and Darjeeling as well as from Meghalaya (3♂) and Dehra Dun (7♂) is deeper than those from Assam valley, Manipur and Orissa.

Rhinocypha fenestrella Rambur

Rhinocypha fenestrella Rambur, 1842, *Ins. Nevrop.* p. 236, Fraser, 1934, *Fauna Brit. India Odon.* 2 : 17-20; Lieftinck, 1954, *Treubia* 22 (suppl.) : 10.

Material examined : Arunachal Pradesh : Subansiri (279) 2♂, 18.v.1966; Assam : Goalpara (132) 4♂, 2.vi.1973; 1♂, 1♀, 3.vi.1973.

Distribution : *Present records* : Arunachal Pradesh, Assam. *Past records* : INDIA : *Eastern India* : Sikkim, Narbong valley (Laidlaw 1917a); Darjeeling (Laidlaw 1917a; St. Quentin 1936).

Elsewhere : ASIA : Burma (Selys 1891); Tennasserim (Laidlaw 1917a); Malayasia (Brooks 1981); Malacca (Fraser 1927a); Malaya : Pulo Penang Isle (Fraser 1927a); scattered in southern Asia, absent in Great Sunda Islands (Lieftinck 1948).

Remark : New records from Arunachal Pradesh, Assam (Mitra 1994).

Intraspecific variation : Male specimens vary from Fraser's (1934b) description since they bear dark black head, dirty white posterior lobe of prothorax, small olivaceous yellow spot on abdomen.

Rhinocypha unimaculata Selys

Rhinocypha unimaculata Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.* p. 61; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 27-29.

Material examined : West Bengal : Darjeeling (266) 2♀, 7.iv.1973; 1♂, 16.iv.1973; 1♂, 18.iv.1973; 1♂, 19.iv.1973.

Distribution : *Present records* : West Bengal. *Past records* : INDIA : *Eastern India* : Kalimpong, Darjeeling (Laidlaw 1920b); Assam (Fraser 1927b, Laidlaw 1917a); *Northern India* : Dehra Dun, Kaligad, Mussorie, Kempti Falls (Bhasin 1953); Chamoli, Pauri, Garhwal, Tehri, Uttar Kashi (Singh & Prasad 1974); Chandigarh (Tyagi 1984).

Elsewhere : ASIA : Nepal (Kiauta & Kiauta 1982a; St. Quentin 1970).

Rhinocypha bifasciata Selys

Rhinocypha bifasciata Selys, 1879, *Bull. Acad. Belg.* (2) 48 : 386; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 29-31.

Material examined : West Bengal : Darjeeling (266) 2♂, 18.iv.1973.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Gopaldhara, Darjeeling (Laidlaw 1917a); Assam, Bengal (Fraser 1927b; 1934b).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Intraspecific variation : The specimens vary from the description provided by Fraser (1934b) in having obscured U-shaped spot on thorax.

Rhinocypha trifasciata Selys

Rhinocypha trifasciata Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.* : 61; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 31-33.

Material examined : West Bengal : Darjeeling (266) 1♂, 18.iv.1973. Nagaland : Mon district, 1♀, 8.vi.1990 (Deposited in ERS, ZSI, Shillong).

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Northern India* : Uttar Pradesh (Kumar 1982); Dehra Dun, Mussorie (Bhasin 1953); Kailana (Fraser 1927b; Laidlaw 1917a) : Kangra valley (Fraser 1934b); Western Himalaya (Asahina 1955; Mani *et. al.* 1955); Garhwal Hills (Prasad 1974). *Central India* :Bastar (Prasad 1996a).

Elsewhere : ASIA : Nepal (Asahina 1955; Kiauta & Kiauta 1982a; St. Quentin 1970).

Intraspecific variation : The apico-lateral spot on segments 1-3 indistinct.

Remark : A new record from the eastern India (Mitra 1994).

Rhinocypha immaculata Selys
(Figs. 28, 30)

Rhinocypha immaculata Selys, 1879, *Bull. Acad. Belg.* (2) **47** : 385 Fraser, 1934, *Fauna Brit. India Odon.* 2 : 35-36.

Material examined : Manipur : Burma border east (47) 1♂, 1♀, 21.ix.1975.

Distribution : *Present record* : Manipur. *Past records* : INDIA : *Eastern India* : Assam, Khasia Hills (Fraser 1927b, 1934b); Cherrapunji (Laidlaw 1917a). Arunachal Pradesh (Prasad 1997b).

Remark : A new record from Manipur (Mitra 1994).

Rhinocypha bisignata Selys

Rhinocypha bisignata Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe) *Syn. Calopt.* : 214.

Material examined : Orissa : Bolangir (38b) 2♂, 17.xi.1973; Kotagarh (171) 2♂, 1♀, 24.v.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Southern India* : Cochin, Coorg, Nilgiris, Palnis (Fraser 1928a); Silent valley (Rao & Lahiri 1983); *Western India* : Maharashtra (Prasad 1996b); Bombay, Khandala (Fraser 1928a). *Central India* : Sagar (Srivastava & Suribabu 1997).

Remark : A new record from the eastern India (Mitra 1994).

Intraspecific variation : Female specimen varies from Fraser's (1934b) description in having green labium, brown 9-10 abdominal segments with dirty white mark. One male specimen from Andhra Pradesh differs from specimens of eastern India since it does not possesses post ocellar and post ocular spots.

Rhinocypha bifenestrata Fraser

Rhinocypha bifenestrata Fraser, 1922, *Mem. Dept. Agric. India (Ent.) 7* : 63; *Fauna Brit. India, Odon.* **2** : 33-35.

Material examined : Arunachal Pradesh : Daphabum (293) 1♂, 3.xii.1969; West Bengal : Darjeeling (246a) 1♂, 30.iv.1972.

Distribution : *Present records* : Arunachal Pradesh, West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling Mungpoo (Fraser 1927b; 1934b; kimmins 1966).

Elsewhere : ASIA : Thailand (Titayavan 1979).

Remark : Addition to the fauna of Arunachal Pradesh (Mitra 1994).

Intraspecific variation : The specimens vary from the description present in the Fauna of British India volume 2, in having brownish black abdomen.

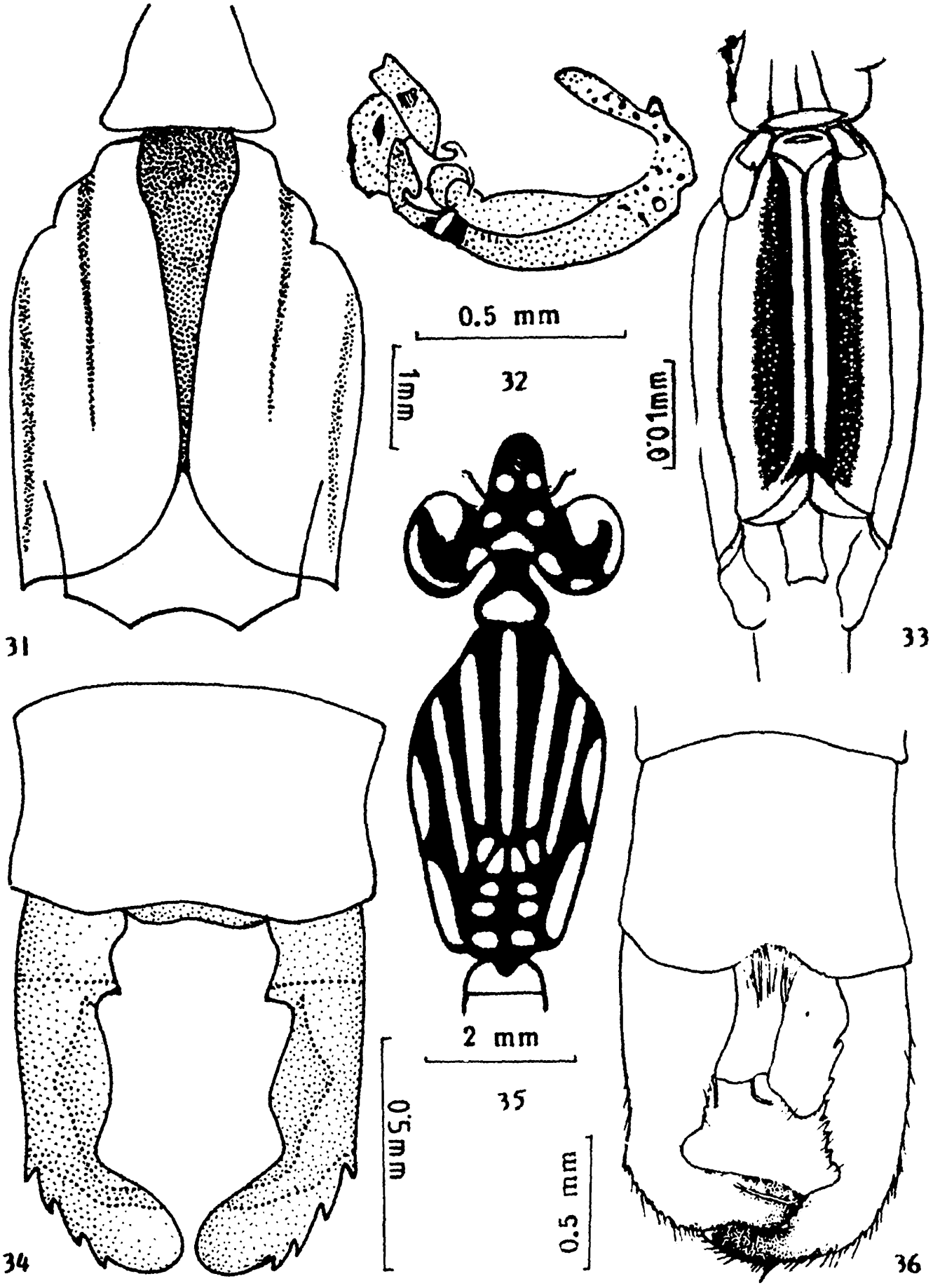


Fig. 31-36. 31. Thorax of male *Rhinocypha quadrimaculata* Selys showing the mesothoracic triangle; 32. Penis of *Rhinocypha quadrimaculata;* 33. Thorax of male *Lestes umbrinus* Selys showing the thoracic markings; 34. 10th abdominal segment and anal appendages of *Lestes dorothea* Fraser (Dorsal view); 35. Markings on head and thorax of male *Libellago 1. lineata* (Burmeister); 36. 10th abdominal segment and anal appendages of male *Lestes umbrinus* Selys

Superfamily LESTOIDEA

Distribution : Cosmopolitan

Key to Families of Superfamily LESTOIDEA

Cu_2 strongly arched towards the costa at origin ..... Synlestidae

Cu_2 without any distinct arch towards the costa at origin ..... Lestidae

Family LESTIDAE

Distribution : Cosmopolitan

Key to Genera of Family LESTIDAE

1. Shape of discoidal cells in fore-and hindwings are identical 2
- Shape of discoidal cells are different in fore-and hindwings ..... *Indolestes* Fraser
2. R_3 arising after 7 or more cells beyond node ..... *Orolestes* McL.
- R_3 arising after 4 cells beyond node ..... *Lestes* Leach.

Genus *Lestes* Leach

Lestes Leach, 1815, In Brewster, *Edinb. Encycl.* **9** : 137; Fraser, 1933, *Fauna Brit. India Odon.* 1 : 29; Lieftinck, 1954 *Treubia* **22** (suppl.) : 25; Pinhey, 1980, *Occas, pap. Natl. Mus. Rhod. B. Nat. Sci.* **6** : 364, Davies, 1981, *Synop. Ext. Gen. Odon.* p. 13.

Type-species : *Lestes sponsa* Hans.

Distribution : Cosmopolitan

Key to Species of Genus *Lestes* Leach

1. Pterostigma nearly squared ..... *platystylus* Rambur
- Pterostigma almost rectangular 2
2. Hindwing more than 22 mm 4
- Hindwing 22 mm or less than that 3
3. Pterostigma unicolorous .. *umbrinus* Selys
- Pterostigma bicolourous 7
4. Abdomen with blue marking 5
- Abdomen without blue marking ..... *viridulus* Rambur
5. Abdomen more than 30 mm 6
- Abdomen 30 or less than 30 mm ..... sp. indet.
6. Antehumeral stripe narrow and expanded above ..... *elatus* Hagen
- Antehumeral stripe broken into lobes .... *dorothea* Fraser
7. Superior anal appendages about one and half times of segment 10 ..... *garoensis* Lahiri
- Superior anal appendages about equal in length of segment 10 ..... *nodalis* Selys

Lestes dorothea Fraser
(Fig. 34)

Lestes dorothea Fraser, 1924, *Rec. Indian Mus.* 26 : 484; Fraser, 1933, *Fauna Brit. India Odon.* 1 : 35-36.

Material examined : Arunachal Pradesh : (211a) 5♂, 5♀, 5-6.iv.1981.

Distribution : *Present record* : Arunachal Pradesh. *Past records* : INDIA : *Eastern India* : Assam (Fraser 1933c), Arunachal Pradesh (Lahiri 1985); Meghalaya (Lahiri 1987); Mizoram (Prasad 1997c). *Southern India* : Coorg (Fraser 1933c).

Elsewhere : ASIA : Nepal (Kiauta 1975)

Lestes elatus Hagen
(Fig. 42)

Lestes elata Hagen, 1858, *Verh. zool.-bot. Ges. Wien.* **18** : 478; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 37-40.

Lestes elatus Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 162.

Lestes elata elata Fraser, 1929, *J. Bombay nat. Hist. Soc.* **33** : 845.

Material examined : Orissa : Cuttack (74) 1♀, 2.xii.1965; Keonjhargarh (159a) 1♂, 1♀, 21.xi.1972. Koraput (168) 1♂, 3.xii.1973; Puri (233) 1♀, 20.iii.1973.

Distribution : *Present record* : Orissa. ***Past***

records : INDIA : *Eastern India* : Orissa (Laidlaw 1920a); Barkuda Island (Fraser & Dover 1922); *Southern India* : Coorg, Nilgiris (Fraser 1924b). Cochin, Deccan, Kanara, Malabar (Fraser 1931a); Bangalore (Laidlaw 1920a); Tamil Nadu (Kumar 1990). *Central India* : Bastar (Prasad 1996a), *Western India* : Goa (Prasad 1995), Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Ceylon (Lieftinck 1971b).

Intraspecific variations : Only the male specimens vary from Fraser's (1933c) description in having yellowish white labrum, brown vertex, pale yellow anal appendages.

Lestes viridulus Rambur
(Figs. 44, 188)

Lestes viridula Rambur, 1842, *Ins. Nevrop.* p. 252; Fraser, 1933 *Fauna Brit. India Odon.* **1** : 45-46.

Lestes viridulus, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 163.

Material examined : Orissa : Bolangir (38b) 1♀, 26.x.1972; 7♂, 4♀, 17.xi.1972; Chandili (58) 1♀, 28.ii.1973; Cuttack (74) 2♂, 2.xii.1965; Ganjam (104) 1♂, 31.xii.1973; Kalahandi (147) 1♂, 6.xii.1973; Koraput (168) 2♂, 28.ii.1973; 1♀, 24.xi.1973; 3♂, 2♀, 28.ii.1973; 1♀, 24.xi.1973; 3♀, 28.xi.1973; Phulbari (230) 3♂, 1♀, 13.x.1973; 1♀, 12.xii.1973; 1♂, 15.xii.1973; 1♀, 17.xii.1973; Sundergarh (375) 1♀, 21.ix.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Eastern India* : Bihar (Prasad & Varshney 1988); *Southern India* : Khandala (Fraser 1924b); Coorg, Deccan (Fraser 1931a); *Northern India* : Uttar Pradesh (Bhasin 1953); Kangra, Dehra Dun (Singh and Prasad 1974) Garhwal Hills (Prasad 1974); Barabanka (Laidlaw 1920a) Chandigarh (Tyagi 1984), Rajasthan (Prasad & Thakur 1981); *Central India* : Madhya Pradesh (Bhasin 1953); Sagar (Srivastava & Suri Babu 1997); Bastar (Prasad 1996a); Indravati Tiger Reserve (Mitra 1995b). *Western India* : Bombay, Elephanta Island (Fraser 1953); Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma (Bhasin 1953).

Remark : An addition to the fauna of Orissa. (Mitra 2000)

Intraspecific variation : Only male specimens vary from Fraser's (1933c) description since they posses brown frons and vertex, lack golden tinge on the bases of mandibles; yellowish brown thorax.

Lestes nodalis Selys
(Fig. 40)

Lestes nodalis Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10** (30) : 496. Fraser, 1933, *Fauna Brit. India Odon.* **1** : 51-53.

Material examined : Manipur : Ukhrul (129) 1♂, 1♀, 24.ii.1975, 1♂, 1.iii.1975; Orissa : Mayurbhanj (194) 1♂, 1♀, 18.viii.1972.

Distribution : *Present records* : Manipur and Orissa. *Past records* : INDIA : *Eastern India* : Assam-Bhutan Frontier (Laidlaw 1920a); Margharita, Assam, throughout N.E. India (Fraser 1930); Singhbhum (Bhasin 1953).

Elsewhere : ASIA : Burma (Bhasin 1953); Palon (Selys 1891); China (Needham 1930); Yunnan (Moore 1878; Selys 1891).

Remark : A new record from Manipur and Orissa. (Mitra 1994)

Intraspecific variation : Only the male specimens vary from Fraser's (1933c) description since they bear brownish yellow labium, and brown at the distal end of hind femora.

Lestes garoensis Lahiri
(Fig. 43)

Lestes garoensis Lahiri, 1987 *Rec. zool. Surv. India, Occ. Paper* 99 : 66-67.

Material examined : Manipur : Ukurul, 1♂, 1.iii.1975, Morch 1♀, 22.ii.1975.

Distribution : *Present and past records* : Manipur and Meghalaya (Lahiri 1987).

Lestes umbrinus Selys
(Figs. 33, 36)

Lestes umbrina Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10**(30) : 497; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 53-55.

Material examined : Bihar : Hazaribagh (126) 1♀, 2.xi.1974; Palamau (191) 2♂, 12.xi.1974; Singhbhum (24) 5♂, 1♀, 7.xii.1974; Orissa : Bolangir (38b) 5♂, 4♀, 1.x.1972; 1♀, 5.x.1972; 1♂, 11.xi.1972; 1♂, 4.xi.1972; 1♀, 16.xi.1972; Koraput (168) 1♀, 23.xi.1973; Mayurbhanj (264a) 1♂, 1♀, 5.ii.1986; Sundergarh (275) 1♀, 21.ix.1972; 2♀, 22.ix.1972; 1♂, 23.x.1973.

Distribution : *Present records* : Bihar and Orissa. *Past records* : INDIA : *Eastern India* : Duars of Bengal (Fraser 1930); *Northern India* : Allahabad (Laidlaw 1920 ; Fraser 1930, 1933c) Chandigarh (Tyagi 1984); *Central India* : Nagpur (Laidlaw 1920a); Sagar (Srivastava & Suri Babu 1997); Bastar (Prasad 1996a); Indravati Tiger Reserve (Mitra 1995b). *Southern India* : Waltair (Laidlaw 1920a); *Western India* : Cutch (Fraser 1930, 1933c, Laidlaw 1920a).

Elsewhere : ASIA : Burma (Fraser 1930; 1933c); Yunnan (Fraser 1933c); Hainan (Needham 1930).

Remark : A addition to the fauna of Bihar and Orissa. (Mitra 1994)

Intraspecific variations : Male specimens from Orissa differ from Bihar specimens as well as from the description of Fraser (1933c) in having prothorax and thorax reddish brown, abdomen pale ochreous. Female specimens of both states bear distinct comma shaped mark on segments 3-7.

Lestes platystylus Rambur

Lestes platystyla Rambur, 1842, *Ins. Nevrop.* p. 254; *Lestes platystylus*, Tsuda, 1991 *A distributional list of World Odonata 1991.* p. 62.

Platylestes platystyla Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 338 : Fraser, 1933, *Fauna Brit. India Odon.* **1** : 59-62.

Material examined : West Bengal : Calcutta 1♂, 13.xi.1917.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1930); Calcutta (Fraser 1933c; Lieftinck 1948; Ram *et. al.* 1983).

Elsewhere : ASIA : Burma (Fraser 1933c); Iraq (Bhasin 1953).

Lestes sp. indet.
(Figs. 37-39)

Material examined : West Bengal : Bankura (21) 1♀, 5.viii.1974.

Abdomen : 29.9 mm., Hindwing 22.8 mm
Head : Labium whitish yellow; labrum, genae and frons bluish-yellow; frons with three black spots; vertex yellow with two black dots close to the eyes.

Prothorax : Greenish yellow laterally, but the anterior and mesothoraxic collar bordered with black.

Thorax : Yellow in continuation with prothorax, white beneath, dorsum with a stripe of bluish green, legs yellow; only the flexor surface of femora of the first and second pairs black; femoral spines short, 12 in number, tibial spines long.

Wings : Hyaline, pterostigma yellowish, elongated covering more than two cells; 11 postnodals in the forewing; 12 in the hind wing; *ac* in between the first two antenodals.

Abdomen : Segment 1 yellow, dorsum of segment 2-6 bluish green segments 7-8 black, but 9 with a triangular black mark at the base. Segment 10 yellow.

Remark : The specimen was sent to the late Dr. M.A. Lieftinck, Rhenen, the Netherlands and Mrs. Leonora K Gloyd, Michigan, USA, for identification but they could not fit it into any known species. The specimen is close to *Lestes malabaricus* Fraser.

Genus *Indolestes* Fraser

Indolestes Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7** : 57. Tsuda, 1991, *A distributional list of World Odonata*, 1991, p. 59.

Distribution : Asia, Australia, Papua New Guinea

Indolestes cyaneus (Selys)

Lestes cyaneas Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 335

Lestes cyaneus, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 163. Lieftinck, 1977, *Entomologia Basilinesia* **2** : 13.

Ceylonolestes cyanea Fraser, 1930, *J. Bombay nat. Hist. Soc.* **34** : 99; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 74-77.

Indolestes cyaneus, Tsuda, 1991, *A distributional list of World Odonata*, 1991, p. 60.

Material examined : West Bengal : Darjeeling (286) 2♂, 1♀, 16.v.1975.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Tiger Hills, Darjeeling (Laidlaw 1920a; Fraser 1930; 1933c) : *Northern India* : Kumaon (Laidlaw 1920a); Simla (Bhasin 1953; Fraser 1930, 1935c; Laidlaw 1920a; Punjab (Fraser 1933c).

Elsewhere : ASIA : Bhutan, (Fraser 1925f; Lieftinck 1977b); Nepal (St. Quentin 1970); Taiwan (Lieftinck *et. al.* 1984).

Remark : Lieftinck (1977b) opined that *Lestes manaliensis* Singh a synonym of *L. cyaneus* Selys. Study of the type material present in Zoological Survey of India reveals that Lieftinck was correct in the decision.

Genus *Orolestes* Mclachlan

Orolestes McLachlan, 1895, *Ann. Mag. Nat. Hist.* (6) 16 : 21 Fraser, 1933, *Fauna Brit. India, Odon.* 1 : 25

Type-species : *Orolestes selysi* McLachlan.

Distribution : India, Brunei, Indonesia, Kampuchea, Laos, Malayasia, Thailand, Taiwan, Vietnam.

Orolestes durga Lahiri

Orolestes durga Lahiri, 1987, *Rec. zool. Surv. India, occ. pap.* **99** : 61

Material examined : Arunachal Pradesh : Sunpura 1♂, 3.xi.1969 (paratype) Meghalaya, Rongrengiri 1♂, 19.iv.1973 (Holotype).

Distribution : Present and Past records : Eastern India : Arunachal Pradesh, Meghalaya.

Family SYNLESTIDAE

It has priority over the name Chlorolestidae (Mitra 1999).

Distribution : Asia, Africa, Australia

Genus *Megalestes* Selys

Megalestes Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 293; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 20; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 18.

Type-species : *Megalestes major* Selys

Distribution : India, Nepal, Burma, Indo-China, China.

Key to Species of Genus *Megalestes* Selys

Postnodals in hindwing 22-24 .... *lieftincki* Lahiri

Postnodals in hindwing 13-16 .... *major* Selys

Megalestes major Selys
(Figs. 46, 49)

Megalestes major, Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 293; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 21-23.

Material examined : Mizoram : Champhai (57b) 1♂, 30.x.1991; Sikkim : Tumin (287a) 1♂, 23.ix.1988; 2♀, 1.x.1988.

Distribution : *Present records* : Mizoram and Sikkim. *Past records* : INDIA : *Eastern India* : Gopaldhara, Pashoke, Darjeeling (Laidlaw 1919a, b); Assam, Sikkim, Mawphlong (Fraser 1929c); Shillong (Asahina 1963a; Fraser 1929c); Arunachal Pradesh (Prasad 1997b). *Northern India* : Kumaon, Bhim Tal (Laidlaw 1920a); Dehra Dun, Mukteswar, North Punjab Hills (Fraser 1929c); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Burma, Tonkin, (Laidlaw 1920a); Formosa (Laidlaw 1920a; Needham 1930); Nepal (Fraser 1929c; Kiauta 1975). Bhutan (Lieftinck 1977b).

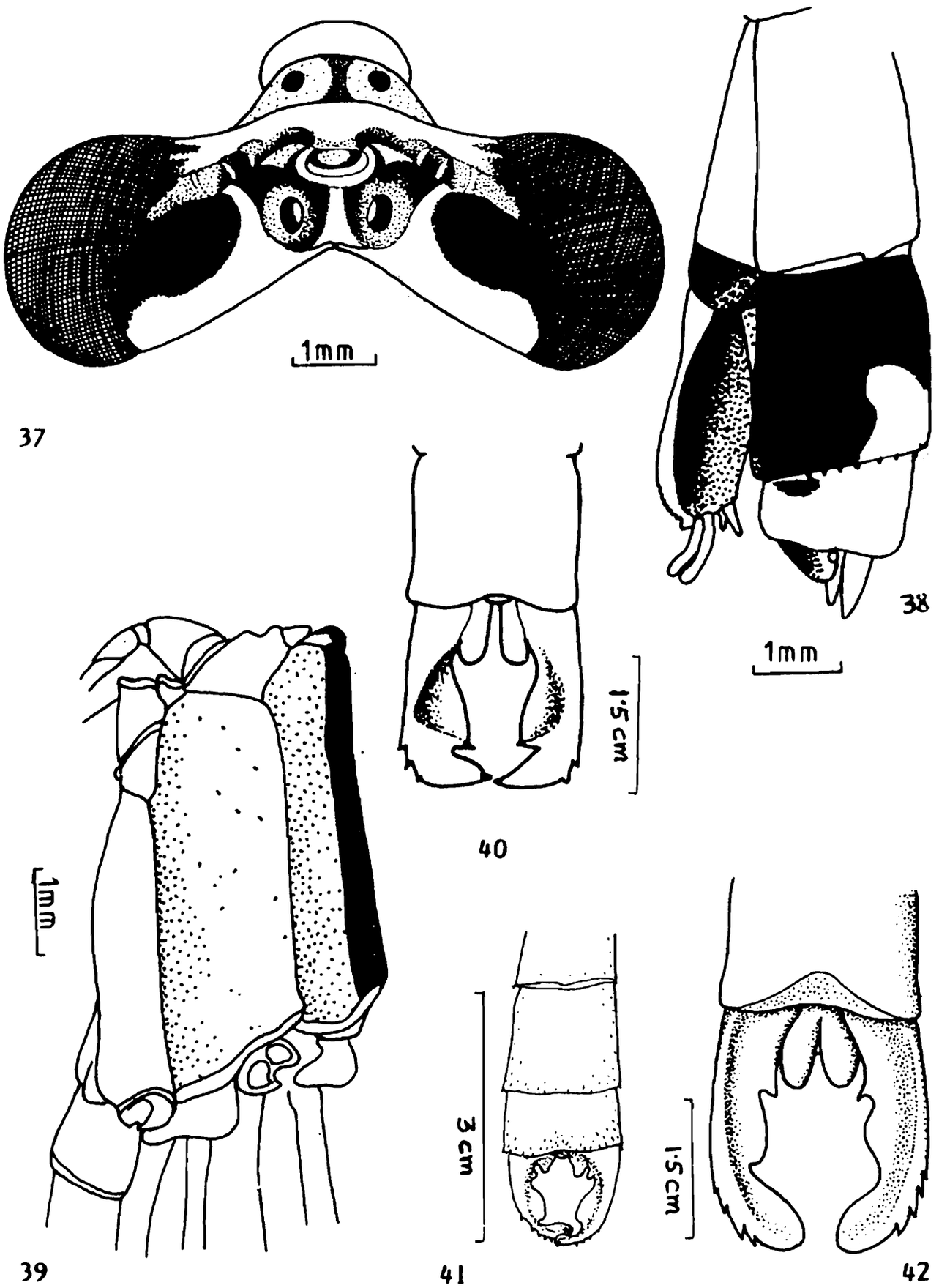


Fig. 37-42. 37. Markings on head of *Lestes* sp. indet; 38. End of abdomen, anal appendages and genitalia of *Lestes* sp. indet showing markings (Left lateral view); 39. Thorax of *Lestes* sp. indet. showing markings (Left lateral view); 40. 10th abdominal segment and anal appendages of male *Lestes nodalis* Selys (Dorsal view); 41. 9th and 10th abdominal segments and anal appendages of male *Lestes thoracicus* (Dorsal view) [Type specimen]; 42. Part of 10th abdominal segment and anal appendages of male *Lestes elatus* Hagen (Dorsal view)

Remark: The female is very robust build while the male is very thin.

A new record for Mizoram (Mitra 1994).

Megalestes lieftincki Lahiri (Fig. 45)

Megalestes lieftincki Lahiri, 1979, *Orient. Insect.* 13(1-2): 122-125.

Material examined: Arunachal Pradesh: Tahlia 1♂, 20.xi.1975.

Distribution: *Present and Past records*: Arunachal Pradesh (Lahiri 1979).

Superfamily COENAGRIONOIDEA

Distribution: Both Hemisphere

Key to Families of Superfamily COENAGRIONOIDEA

1. Anal vein (IA) absent ..... Protoneuridae
– Anal vein (IA) present and fairly long 2
2. Discoidal cell almost rectangular; costal or anterior side slightly shorter than the basal ..... Platycnemididae
– Discoidal angle of the discoidal cell usually acute; costal side much shorter than the basal ..... Coenagrionidae

Family PROTONEURIDAE

Distribution: Cosmopolitan.

Key to Genera of Family PROTONEURIDAE

Cu_2 extending more than half the length of the wing ..... *Disparoneura* Selys

Cu_2 not extending half the length of the wing ..... *Caconeura* Kirby

Genus *Disparoneura* Selys

Disparoneura Selys, 1860, *Bull. Acad. Belg.* (2) **10**: 445; Lieftinck 1953, *Treubia* 21: 678; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 11.

Chloroneura Laidlaw, 1917, *Rec. Indian Mus.* 13: 323, 344; Fraser, 1933, *Fauna Brit. India Odon.* 1: 244.

Type-species: *Argia quadrimaculata* Rambur

Distribution: India, Sri Lanka.

Disparoneura quadrimaculata (Rambur) (Fig. 51)

Argia quadrimaculata Rambur, 1842, *Ins. Nevrop.* p. 255.

Chloroneura quadrimaculata Laidlaw, 1917, *Rec. Indian Mus.* **13**: 323; 344; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 246-248.

Disparoneura quadrimaculata Lieftinck, 1953, *Treubia* 21: 678.

Material examined: Bihar: Hazaribagh (126) 1♂, 20.vi.1975; 1♂, 30.vi.1975; West Bengal: Bankura (65) 1♂, 1♀, 31.vii.1974.

Distribution: *Present records*: Bihar and West Bengal. *Past records*: INDIA: *Central India*: Medha, Nagpur, Satara, Yenna Valley (Laidlaw 1917b); Bagra, Hosangabad (Fraser 1919b); Sagar (Srivastava & Suri Babu 1997); *Southern India*: Coorg (Fraser 1931a); *Western India*: Bombay Presidency (Laidlaw 1915c); Mahabaleswar, Poona (Fraser 1924b); Maharashtra (Prasad 1996b). *Northern India*: Rajasthan (Tyagi & Miller 1991).

Remarks: An addition to the fauna of eastern India (Mitra 1994).

Intraspecific variation: Only male specimens vary from the description provided by Fraser (1933c) since they have got pale ochreous labium, and light brown legs; but they do not differ from the specimens of the distinct Mirzapur of Uttar Pradesh.

Genus *Caconeura* Kirby

Caconeura Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 132; Lieftinck, 1953, *Treubia* 21: 678; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 11.

Indoneura Laidlaw, 1917, *Rec. Indian Mus.* 13: 347; Fraser, 1933, *Fauna Brit. India Odon.* 1: 251.

Type-species: *Argia gomphoides* Rambur

Distribution: India.

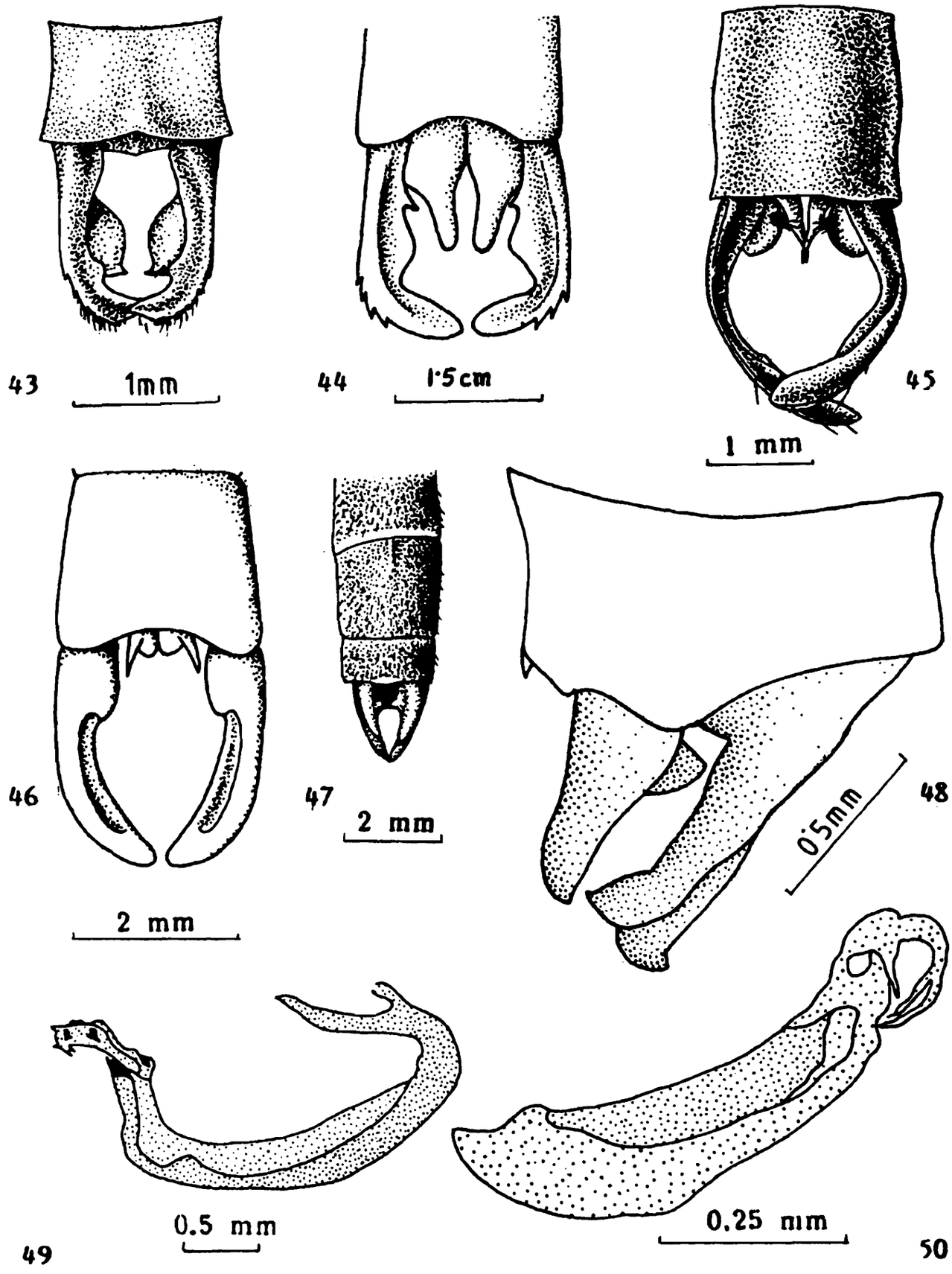


Fig. 43-50. 43. 10th abdominal segment and anal appendages of male *Lestes garoensis* (Dorsal view) [Type specimen]; 44. Part of 10th abdominal segment and anal appendages of male *Lestes viridulus* Rambur (Dorsal view); 45. 10th abdominal segment and anal appendages of male *Megalestes lieftincki* Lahiri (Dorsal view) [Type specimen]; 46. 10th abdominal segment and anal appendages of male *Megalestes major* Selys (Dorsal view); 47. 9th and 10th abdominal segments and anal appendages of male *Calicnemia miniata* (Selys) (Dorsal view); 48. 10th abdominal segments and anal appendages of male *Calicnemia eximia* (Selys) (Left lateral view); 49. Penis of *Megalestes major* Selys; 50. Penis of *Calicnemia eximia* Selys.

Caconeura gomphoides (Rambur) (Fig. 52)

Argia gomphoides Rambur, 1842, *Ins. Névrop.* p. 256.

Alleneura gomphoides, Selys, 1860, *Bull. Acad. Belg.* (2) **10** : 448.

Disparoneura gomphoides, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 134.

Indoneura gomphoides, Laidlaw, 1917, *Rec. Indian Mus.* **13** : 337-348; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 252-254.

Material examined : Orissa : Kotagarh (171) 7♂, 10.v.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Southern India* : North Kanara, Talewadi (Laidlaw 1917b); Nilgiri Hills (Lieftinck 1953).

Remark : A new record from the eastern India (Mitra 1994).

Intraspecific variation : Three specimens differ from Fraser's (1933c) description due to their yellow colour. The late Dr. M.A. Lieftinck remarked that these are atypical.

Family PLATYCNEMIDIDAE

Distribution : Mainly Old World, scarcely in the New World.

Key to Genera of Family PLATYCNEMIDIDAE

1. Tibiae of males dilated; *ab.* terminates proximal to *ac* 2
- Tibiae of males not dilated; *ab.* terminates at the level of *ac* ..... *Coeliccia* Kirby
2. Costal side of the discoidal cell of the forewing shorter than the posterior side ..... *Calicnemia* Strand
- Costal side of the discoidal cell of the forewing equal to the posterior side ..... *Copera* Kirby

Genus *Calicnemia* Strand

Calicnemia Strand, 1926, *Arch. Naturgesch* **92** A : 146; Lieftinck, 1954, *Treubia* **22** (suppl.) : 45; 1958, *Nova Guinea* **9** : 284; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 9.

Calicnemis Selys, 1893, *Bull. Acad. Belg.* (2) **161** : 159 (nom. preocc.); Fraser, 1933, *Fauna Brit. India Odon.* **1** : 171.

Type-species : *Calicnemis eximia* Selys

Distribution : Southeast Asia.

Key to Species of Genus *Calicnemia* Strand

Abdomen in male bright vermillion red without any mark; in female abdomen 33-34 mm, dark ochreous with black at the apical end ..... *eximia* (Selys)

Abdomen in male blood red with large brown mark on dorsum of segments 8-10 and segment 1 pale green; in female the abdomen 30-32 mm with black mark on segments 8-10 ..... *miles* (Laidlaw)

Abdomen blood red with segments 8-10 black ..... *miniata* (Selys)

Abdomen black with bright ochreous spot on dorsum of segment 1-3 .... *mortoni* (Laidlaw)

Abdomen black without any marking .... *sudhaae* Mitra.

Calicnemia eximia (Selys) (Figs. 48, 50)

Calicnemis eximia Selys, 1863, *Bull. Acad. Belg.* (2) **16** : 160; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 174-175.

Calicnemia eximia, Lieftinck, 1984, *Odonatologica* 13 : 361.

Material examined : Arunachal Pradesh : Namdhapa (211a) 1♀, 24.iv.1981; Siang (95) 1♂, 22.x.1966; Nagaland : Zunheboto. 2♂, 6.viii.1991. (Deposited in ERS, ZSI, Shillong); Sikkim; Gangtak (103) 1♀, 27.x.1977. West Bengal : Darjeeling (245) 3♂, 7.iv.1973; (127) 8♂, 1♀, 20.iv.1973; (266) 1♂, 18.iv.1973; (192) 2♂, 1♀, 16.iv.1976; (245) 1♂, 19.iv.1976; (182) 1♂, 1♀, 24.iv.1976.

Distribution : *Present records* : Arunachal Pradesh, Nagaland, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Darjeeling) Sikkim (Fraser 1932b);

Arunachal Pradesh (Lahiri 1985); Meghalaya (Lahiri 1987); Mizoram (Prasad 1997c). *Northern India* : Uttar Pradesh (Bhasin 1953); Kumaon (Laidlaw 1917b); Himachal Pradesh (Lieftinck 1984).

Elsewhere : ASIA : Nepal (St. Quentin 1970); China (Chao 1981; Needham 1932); Taiwan, Afghanistan (Lieftinck *et. al* 1984). Bangladesh (Tsuda 1991).

Intraspecific variation : Labrum, bases of mandibles and vertex brick red instead of vermillion red as reported by Fraser (1933c).

Calicnemia miles (Laidlaw) (Figs. 57-58, 189)

Calicnemis eximia Race *atkinsoni* Selys *(C. eximia* ♀nec. *atkinsoni)* 1886, *Mem. Cour.* **38** : 131; 132.

Calicnemis atkinsoni Selys, 1891, *Ann. Mus. civ. Genova* (2) **10** (30) : 503.

Calicnemis miles Laidlaw, 1917, *Rec. Indian Mus.* 13 : 330: Fraser, 1933, *Fauna Brit. India Odon.* **1** : 178-181.

Material examined : Manipur : Moirang (202) 1♀, 13.xi.1983 New Chura Chandpur (46) 1♀, 19.ix.1975; Morch (204) 2♀, 26.ii.1975 West Bengal : Darjeeling (189) 1♂, 27.v.1975; 2♂, 30.v.1975.

Distribution : *Present records* : Manipur and West Bengal. *Past records* : INDIA : *Eastern India* : Sikkim (Fraser 1932b; 1933c) *Northern India* : Chamoli, Dehra Dun, Garhwal, Kangra, Pauri, Tehri (Singh & Prasad 1974); Uttar Pradesh (Bhasin 1953) : Dehra Dun (Kumar & Prasad 1977a); Kangra (Prasad 1976);

Elsewhere : ASIA : Bhutan (Lieftinck 1977b), Burma (Fraser 1932b, 1933c, Lieftinck 1977b; Selys 1891); Thailand (Lieftinck 1984).

Remark : Addition to the fauna of Manipur and West Bengal (Mitra 1994).

Intraspecific variation : Both sexes differ from the description made by Fraser (1933c) due to their brown labium and anal appendages instead of pale brown labium in male and yellow in female, with dark brown anal appendages in both sexes.

Calicnemia miniata (Selys) (Fig. 47)

Calicnemis miniata Selys, 1886, *Mem. Cour.* **38** : 132..

Calicnemia miniata, Tsuda, 1991, *A distributional list of World Odonata, 1991* p. 51.

Material examined : West Bengal : Darjeeling (244) 1♂, 15.v.1987.

Distribution : *Present record* : West Bengal. *Past record* : INDIA : *Eastern India* : Darjeeling and Sikkim (Fraser 1933c); Mizoram (Prasad 1997c).

Elsewhere : ASIA : Nepal (Kiauta & Kiauta 1982a); China, Szechuan (Needham 1931); Bangladesh (Tsuda 1991).

Calicnemia mortoni (Laidlaw) (Fig. 53)

Calicnemis mortoni Laidlaw, 1917, *Rec. Indian Mus.* **13** : 526-527.

Calicnemia mortoni Tsuda, 1991, *A distributional list of World Odonata 1991.* p. 51.

Material examined : West Bengal : Darjeeling, Pashoke, 1♂, June 1916 (Holotype).

Distribution : *Present record* : West Bengal. *Past record* : INDIA : *Eastern India* : Darjeeling, Gangtak (Lieftinck 1984).

Elsewhere : ASIA : Bhutan (Tsuda 1991).

Calicnemia sudhaae Mitra (Fig. 54-56)

Calicnemia sudhaae Mitra, 1994, *Rec. zool. Surv. India, Occ. Pap* No. 166, p. 28.

Material examined : *Holotype* : Mizoram : Terei (Dampa wildlife sanctuary) 1♂, 24.x.1991; ZSI. Reg. No. 4133/H13; Allotype : Mizoram : Terei (Dampa wildlife sanctuary) 1♀, 24.x.1991 ZSI Reg. No. 4134/H13; *Paratypes* : Mizoram : Terei (Dampa wildlife sanctuary) 2♂, 24.x.1991; Bung : 3♂, 26.x.1991. ZSI Reg. Nos. 4135/H13; 4136/H13; 4137/H13; 4138/H13. Deposited in the National Zoological Collection at ZSI, Kolkata.

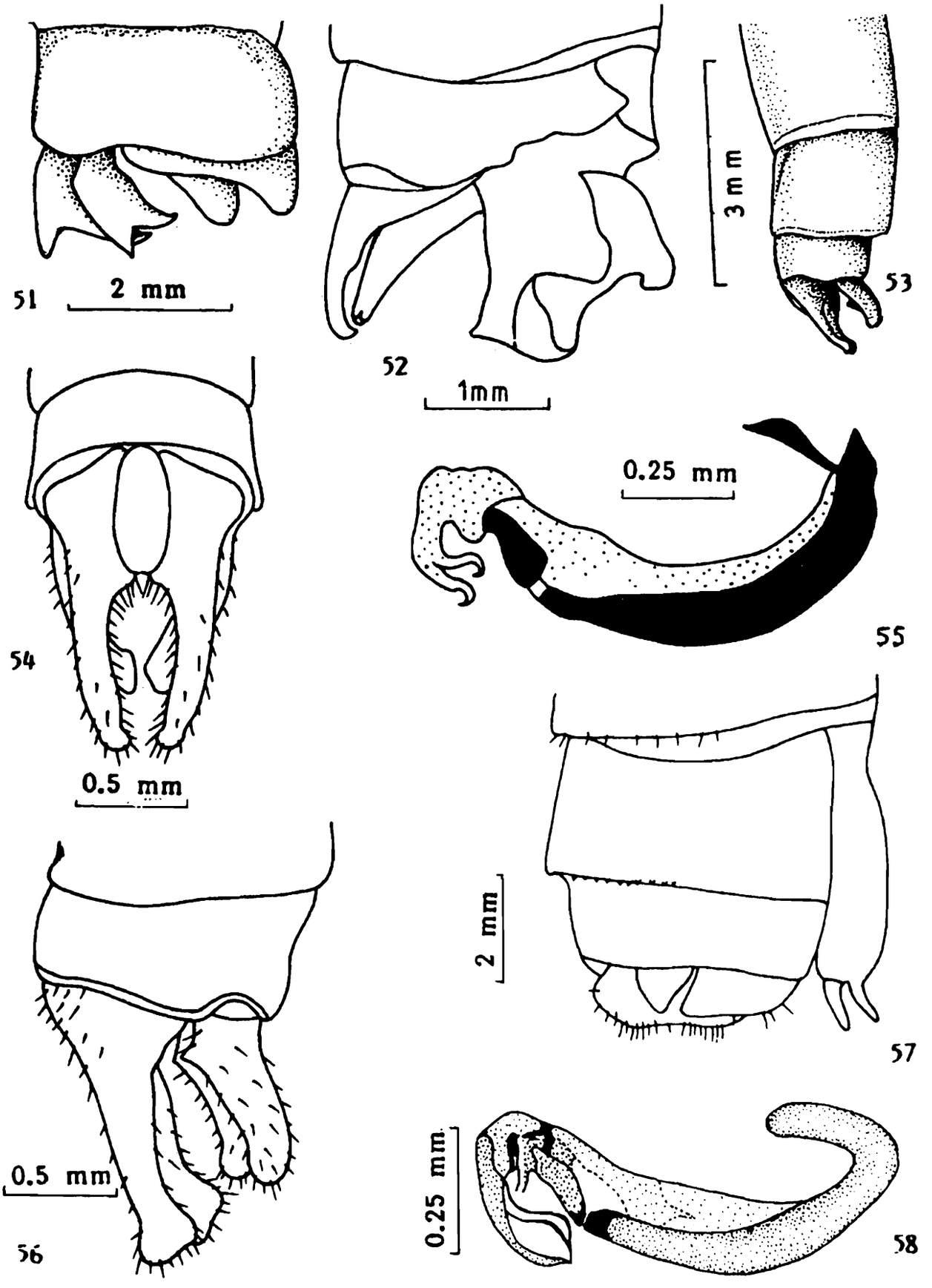


Fig. 51-58. 51. 10th abdominal segment and anal appendages of *Disparoneura quadrimaculata* (Rambur) (Right lateral view); 52. 10th abdominal segment and anal appendages of male *Caconeura gomphoides* (Rambur) (Left lateral view); 53. 9th and 10th abdominal segments and anal appendages of *Calicnemia mortoni* (Laidlaw) (Right lateral view) [Type specimen]; 54. 10th abdominal segment and anal appendages of male *Calicnemia sudhaae* sp. n. (Dorsal view); 55. Penis of the same species; 56. 10th abdominal segment and anal appendages of the same species (Right lateral view); 57. 9th and 10th abdominal segments, anal appendages of female *Calicnemia miles* (Laidlaw) (Right lateral view); 58. Penis of *Calicnemia miles*.

Male

Abdomen 28-30 mm Hindwing 20-22 mm

Head : Labium blackish brown, labrum black, bases of mandible, clypeus black, rest of head black; pruinosed in part as follows : A thick band including the basal joints of antennae extending from eye to eye from the frontal part of frons to a line drawn through the interocellar space, behind this again, black up to the end of head. *Prothorax* black, middle lobe pruinosed, the posterior lobe black, rounded projected back over front of thorax. *Thorax* black; the antehumeral stripe pruinosed blue, laterally the posterolateral suture black; otherwise the lateral side is blue due to pruinescens; black beneath. *Legs* black. *Wings* hyaline, pterostigma brownish black, covering more than one cell, braced. Postnodals in forewing 16-18, in hindwing 13-17; three cells between the discoidal cell and the nervure descending from the subnode. *Abdomen* black. *Anal appendages* black; inferiors faint yellow at apex, black at base. Superiors longer than segment 10, inferiors longer than superiors. Penile organ narrow, curved at base flagella one pair, long ribbon like with pointed apex.

Female

Abdomen 28 mm Hindwing 22 mm

Head : Labium yellow, Labrum brownish yellow, vertex black, bases of antennae yellow; *Prothorax* black, lateral sides yellow; posterior lobe small, rounded black. Thorax black on dorsum, narrow olivaceous yellow antehumeral stripes, laterally olivaceous yellow except a black band on the posterolateral suture; beneath pale yellow. *Legs* yellow but extensor surface of legs black, spines black, *Wings* hyaline, pterostigma dark brown, covering more than one cell, 16 postnodals in fore wing and 15 in the hind wing, three cells between the discoidal cell and the vein descending from the subnode. *Abdomen* black; first segment yellow broadly on sides, yellow lines on the lateral side extends up to the fifth segment; 6 to 10 black on all sides, vulvar scale black, stout.

Remark : The species resembles *Calicnemia pulverulans* Selys, but easily distinguishable from the latter with the aid of the length of hindwing (20-22 mm) which is smaller than that of *C. pulverulans* (25-26 mm) the colour of labium in both sexes and the male penile organ.

Genus *Coeliccia* Kirby

Coeliccia Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 128; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 152; Lieftinck, 1954, *Treubia* **22** (suppl.) : 45; 1958, *Nova Guinea* **9** : 284; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 9.

Type-species : *Platycnemis membranipes* Rambur

Distribution : Southeast Asia.

Key to Species of Genus *Coeliccia* Kirby

Thorax black with blue oval spots on dorsum ..... *bimaculata* Laidlaw

Thorax black without oval spot on dorsum ..... *prakritiae* Lahiri

Coeliccia bimaculata Laidlaw
(Fig. 60)

Coeliccia bimaculata Laidlaw, 1914, *Rec. Indian Mus.* **8** : 341; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 154-155.

Material examined : Assam : Sangsak (254) 1♂, 6.v.1979.

Distribution : *Present record* : Assam. *Past records* : INDIA : *Eastern India* : Dejoo, Upper Assam (Laidlaw 1914); Abor Hills (Laidlaw 1914; 1917b); Tura, Garo Hills (Fraser 1932a; 1933c; Lahiri 1987); Arunachal Pradesh (Prasad 1997b).

Intraspecific variation : The specimen varies from Fraser's (1933c) description in having dark brown labrum, dirty white anal appendages.

* The species has been named in honour of my mother the late Sudha Rani Mitra.

Coeliccia prakritiae Lahiri
(Fig. 59)

Coeliccia prakritii Lahiri, 1985, *Rec. zool. Surv. India* : **82** : 62-65.

Material examined : Arunachal Pradesh : Namdhapa (211a) (Holotypes & Paratypes) 4♂, 2.v.1981.

Distribution : *Present record* : Arunachal Pradesh. *Past record* : INDIA : *Eastern India* : Arunachal Pradesh (Lahiri 1985)

N.B. Lahiri, A.R. (1985) the author of the species wrote *Coeliccia prakritii;* since the species was described in the name of the author's mother the spelling of the species name will be "PRAKRITIAE"

Genus *Copera* Kirby

Copera Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 129; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 191; Lieftinck, 1954, *Treubia* 22 (suppl.) : 50; 1958, *Nova Guinea* **9** : 284, Davies, 1981, *Synop, Ext. Gen. Odon.* p. 10.

Type-species : *Platycnemis marginipes* Rambur

Distribution : Southeast Asia.

Key to Species of Genus *Copera* Kirby

Vertex uniformly brown .... *vittata serapica* (Selys)

Vertex traversed from eye to eye by a moderately broad black stripe..... .....*vittata assamensis* Laidlaw

Vertex with a black triangular area..... .....*ciliata* (Selys)

Vertex with a bronzed-black fascia, extending from eye to eye followed by a moderately broad greenish white stripe in male; in female the black fascia is broken .... *marginipes* (Rambur)

Copera marginipes (Rambur)
(Figs. 61-63)

Platycnemis marginipes Rambur, 1842, *Ins. Nevrop.* p. 240.

Copera marginipes Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 129; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 192-197; Lieftinck, 1954, *Treubia* **22** (Suppl.) : 51-52.

Material examined : Assam : Goalpara (145) 1♀, 10.xii.1973; Bihar : Hararіagh (126 2♀, 29.x.1974; 2♂, 1.xi.1974; 2♂, 2♀, 2.xi.1974; 1♂, 27.vi.1975; Palamau (222) 1♂, 1♀, 13.vi.1983; Manipur : Morch (204) 1♂, 25.xi.1983; West Bengal : Calcutta (52) 1♂, 20.x.1985.

Distribution : *Present records* : Assam, Bihar, Manipur, West Bengal. *Past records* : INDIA : *Eastern India* : Jalpaiguri, Assam, Margharita (Fraser 1933b, c); Singhbhum (Bhasin 1953); Meghalaya (Lahiri 1987); *Central India* : Madhya Pradesh (Bhasin 1953); Sagar (Srivastava & Suri Babu 1997); *Western India* : Pench National Park, Maharashtra (Kalaskar & Kalaskar 1998), Bombay, Mahabaleswar, Poona, (Fraser 1933b, c); Andamans (Lahiri 1998); *Northern India* : Rajasthan (Prasad & Thakur 1981) Dehra Dun, Kangra (Singh & Prasad 1974); Garhwal Hills (Prasad 1974); *Southern India* : Bangalore (Bhasin 1953); Cochin (Laidlaw 1917b); Palni Hills (Fraser 1924b); Bollovumpattis, Coorg, Deccan, Malabar, Nilgiris (Fraser 1931a); Silent Valley (Rao & Lahiri 1983).

Elsewhere : ASIA : Burma (Bhasin 1953; Lieftinck 1948; Selys 1891) Ceylon (Fraser 1933b, c; Lieftinck 1971b); Malacca (Selys 1891); Malayasia (Brooks 1981; Lieftinck 1954; Selys 1891); Nepal (St. Quentin 1970); Thailand (Kiauta & Kiauta 1983b); China (Needham 1930); Taiwan (Lieftinck *et. al.* 1984). Hongkong (Tsuda 1991).

Remark : A new record from Manipur (Mitra 1994).

Intraspecific variation : The specimens agree with the description provided by Fraser (1933c), but the superior anal appendages of male specimens from Andaman Islands differ from the present specimens being obtusely triangular.

Copera vittata serapica (Selys)
(Figs. 64, 66)

Psilocnemis vittata Selys, 1863, *Bull. Acad. Belg.* (2) **16** : 170; 1886, *Mem. Cour. Acad. Belg.* **38** : 121-122.

Copera vittata, Kirby, 1890 *Syn. Cat. Neur. Odon.* p. 129; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 198-201.

Copera vittata serapica, Tsuda, 1991. *A distributional list of World Odonata, 1991.* p. 53.

Material examined : Arunachal Pradesh : Nmasai (212a) 1♀, 5.iii.1969.

Distribution : *Present record* : Arunachal Pradesh. *Past records* : INDIA : *Eastern India* : Bengal (Fraser 1933c); Assam (Laidlaw 1917b); Sibsagar (Bhasin 1953); Meghalaya (Lahiri 1987); *Southern India* : Annaimalai (Fraser 1933b); Coorg, Malabar, Nilgiris, Wynaad, (Fraser 1924b); Cochin (Laidlaw 1917b); Silent Valley (Rao & Lahiri 1983). *Northern India* : Dehra Dun (Kumar & Mitra 1998).

Elsewhere : ASIA : Burma (Bhasin 1953; Fraser 1933b, c).

Remark : A new record from Arunachal Pradesh (Mitra 1994).

Intraspecific variation : It agrees with the description provided by Fraser (1933c). One example from Nicobar Island varies from the present one in having dark brown thorax, yellowish-blue antehumeral stripe, reddish yellow middorsal carina.

Copera vittata assamensis Laidlaw
(Fig. 65)

Copera vittata assamensis Laidlaw, 1914, *Rec. Indian Mus.* 8 : 342.

Copera assamensis Fraser, 1933, *Fauna Brit. India Odon.* **1** : 201-203.

Material examined : Arunachal Pradesh : Chandan Forest (60) 1♂, 24.iii.1973; Assam : Goalpara (132) 1♀, 8.vi.1973; Manipur : Morch (204) 2♂, 24.ii.1975.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur. *Past records* : INDIA : *Eastern India* : Assam, North Lakhimpur (Laidlaw 1914).

Elsewhere : ASIA : Assam to Indo-China (Fraser 1933b, c).

Intraspecific variation : The male specimens differ from Fraser's (1933c) description in having faint bluish yellow labium.

Copera ciliata (Selys)
(Figs. 67, 69)

Psilocnemis annulata Selys, 1863, *Bull. Acad. Belg.* (2) **16** : 172-173.

Psilocnemis subannulata Selys, 1886, *Mem. Cour.* 38 : 125.

Copera annulata Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 129; Laidlaw, 1914, *Rec. Indian Mus.* **8** : 341-342; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 203-206.

Copera ciliata, Tsuda, 1991. *A distributional list of World Odonata 1991* p. 52.

Material examined : Manipur : Moirang 1♂, 19.iii.1974; West Bengal; Calcutta (52) 1♂, 1♀, 11.iii.1967.

Distribution : *Present records* : Manipur and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1933b, c; Laidlaw 1917b); Calcutta (Mitra 1983) North Lakhimpur (Laidlaw 1914); Manipur (Lahiri 1977b). Nicobar (Laidlaw 1917b). Meghalaya (Lahiri 1987).

Elsewhere : ASIA : China (Rowe 1981); Indo-China (Fraser 1933b,c); Japan (Fraser 1933b,c; Laidlaw 1917b); Malayasia (Brooks 1981; Fraser 1933b,c); Sumatra (Laidlaw 1917b) Thailand (Kiauta & Kiauta 1983b). Taiwan (Lieftinck *et. al* 1984). Bangladesh, Hongkong, Vietnam (Tsuda 1991).

Intraspecific variation : The specimens from West Bengal differ from the description provided by Fraser (1933c) in having faintly brown labrum, frons and vertex bluish-yellow, distal ends of femora slightly darker than the ground colour in male; while in female the bluish-yellow regions are replaced by pale blue colour. The specimens from Manipur does not differ from the description in the Fauna of British India.

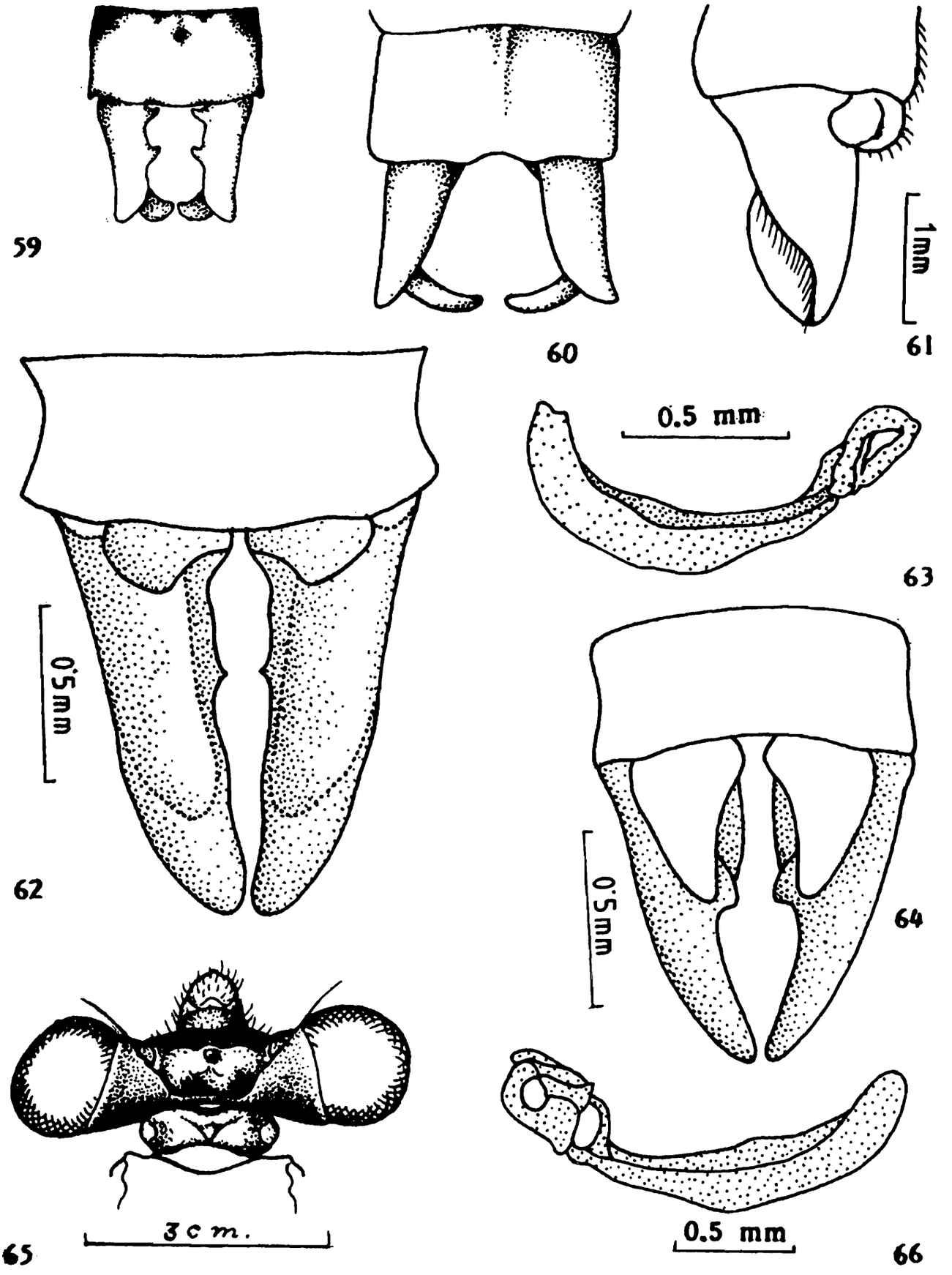


Fig. 59-66. 59. 10th abdominal segment and anal appendages of male *Coeliccia prakritiae* Lahiri (Dorsal view); 60. 10th abdominal segment and anal appendages of male *Coeliccia bimaculata* Laidlaw (Dorsal view); 61. Anal appendages of male *Copera marginipes* (Rambur) (Left lateral view); 62. 10th abdominal segment and anal appendages of the same (Dorsal view); 63. Penis of the same; 64. 10th abdominal segment and anal appendages of male *Copera vittata serapica* (Selys) (Dorsal view); 65. Head and prothorax of *Copera vittata assamensis* Laidlaw showing markings on them; 66. Penis of *Copera v. serapica* (Selys)

Family COENAGRIONIDAE

Distribution : Cosmopolitan

Key to Genera of Family COENAGRIONIDAE

1. Arc is away from the distal antenodal nervure 8
- Arc is close to the distal antenodal nervure 2
2. A prominent ridge on the frons; postocular spots absent ..... *Ceriagrion* Selys
- No ridge on frons; postocular spots present 3
3. *ab* arising at the level of *ac* 4
- *ab* well proximal to *ac* 5
4. Pterostigma in forewing is longer than in hindwing; prothorax of both sexes simple; female with apical ventral spine on segment 8 7
- Pterostigma equal in fore and hindwings; prothorax simple in male, but in female with spine; no ventral apical spine on segment 8 of female ..... *Pseudagrion* Selys
5. Borders of or body of pterostigma bicolourous 9
- Pterostigma unicolourous 6
6. *ac.* midway between the antenodals, postocular coloured spot present ..... *Enallagma* Charp.
- *ac.* near the level of the proximal antenodal, postocular coloured spot absent ..... *Onychargia* Selys
7. Pterostigma different in length in fore- and hindwings, 10-12 postnodals in forewing ..... *Aciagrion* Selys
- Pterostigma same in both fore-and hindwings, 7-10 postnodals in forewing ..... *Cercion* Navas
8. Large specimens (Abdomen 29-31 mm) ..... *Argiocnemis* Selys
- Medium sized specimens (Abdomen 23-25 mm) ..... *Mortonagrion* Fraser
- Small specimens (Abdomen 16-20 mm).. ..... *Agriocnemis* Selys
9. Tubercles on segment 10 closely apposed ..... *Ischnura* Charpentier
- Tubercles on segment 10 widely separated ..... *Rhodischnura* Laidlaw

Genus ***Pseudagrion*** Selys

Pseudagrion Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 490; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 274; Lieftinck, 1954, *Treubia* **22** (suppl.) : 56; Pinhey, 1964, *Revta, Ent. de Mocambique* **7** : 5-196; Davies, 1981 *Synop. Ext. Gen. Odon.* p. 3.

Type-species : *Agrion furcigerum* Rambur

Distribution : India, Burma, Sri Lanka (=Ceylon), Andaman Island, Madagascar, Sierra Leon, Ivory Coast, West Africa, Zambia, Nigeria, Angola, Cameroons, Zimbabwe, Upper Congo; Zambezi, Senegal, Natal, Syria, Palestine, Transvaal, Timor, N.E. Australia, Philippines; Celebes; Papua, North Australia; Sunda Island; Marques Island; China, Java, Siberia, Luzon, Mayotte Island, Solomon Island.

Key to Species of Genus *Pseudagrion* Selys*

Male

1. Middorsum of thorax finely black with parallel lines 2
- Middorsum of thorax broadly black 4
- Middorsum of thorax with thick black stripe without any parallel lines 3
2. Thorax bluish-green on dursum and the colour extends slightly beyond the level of humeral suture ..... *decorum* (Rambur)
- Thorax olivaceous-green with golden tinge as far back as the first lateral suture ..... *rubriceps rubriceps* Selys

* Male of *Pseudagrion malabaricum* and female of *P. australasiae, P. hypermelas, P. spencei* were not available. Hence key for identification has not been cited.

3. Lateral suture of thorax mapped in black ..... *microcephalum* (Rambur)

– Small black spot on the lateral side of mesepimeron and a thicker spot on the upper end of lateral suture ..... *australasise* Selys

4. Middorsum of thorax black and extends broadly over the humeral sutures ..... *hypermelas* Selys

– Middorsum of thorax black, with narrow black humeral stripe, upper part of the posterolateral suture black ..... *spencei* Fraser

Female

1. Middorsum of thorax with thick black stripe ..... *malabaricum* Fraser

– Middorsum of thorax with thick black line 2

2. Thorax with three black lines ..... *rubriceps rubriceps* Selys

– Thorax with single black line 3

3. Segment 10 with black stripe ..... *decorum* (Rambur)

– Segment 10 without black stripe ..... *microcephalum* (Rambur)

Pseudagrion microcephalum (Rambur)
(Fig. 77)

Agrion microcephalum Rambur, 1842, *Ins. Nevrop.* p. 259.

Pseudagrion microcephalum, Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 504; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 278-280; Lieftinck, 1954, *Treubia* **22** (suppl.) : 57.

Material examined : West Bengal : Calcutta (52) 2♂, 20.xi.1966; 1♂, 1♀, Hooghly (257) 1♂, 24.x.1975; Howrah (120a) 1♂, 29.xi.1966.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Assam (Lahiri 1979); Chilka Lake (Fraser & Dover 1922; Laidlaw 1915d); Howrah, Hooghly & 24 Parganas districts of West Bengal (Ram *et. al.* 1982). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); *Central India* : Hosangabad, Panchmari, Satpari Hills (Fraser 1919a); Sagar (Srivastava & Suri Babu 1997); *Western India* : Bombay (Selys 1891); Goa (Prasad 1995). *Southern India* : Nilgiris, Wynaad, Ootacamund (Fraser 1924b); Cochin, Coorg, Deccan, Kanara, Malabar (Fraser 1931a).

Elsewhere : ASIA : Bangladesh (Dasgupta 1957; Selys 1891); Burma, Puepoli (Selys 1891); China (Needham 1930), Ceylon (Lieftinck 1971b); Malaya to Bismark (Laidlaw 1916a); Java (Selys 1891); New-Hebrides (Lieftinck 1948); Philippines (Kiauta & Kiauta 1983a), Ryuku Is., Solomon Is., Taiwan, Thailand (Lieftinck *et. al.* 1984); Japan, Malayasia, Nepal, Singapore, Vietnam; Australia, Papua New-Guinea (Tsuda 1991).

Pseudagrion austrlasiae Selys
(Figs. 71-73)

Pseudagrion microcephalum race? *australasiae* Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 491, 506.

Pseudagrion bengalense Laidlaw, 1919, *Rec. Indian Mus.* **16** : 192-193; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 282-284.

Pseudagrion australasiae, Laidlaw, 1916, *Rec. Indian Mus.* **12** : 21-23; Lieftinck, 1954, *Treubia* **22** (suppl.) : 56.

Material examined : Manipur : Fagakchaokhiai (100) 1♂, 19.iii.1974; Nagaland : zunheboto 1♂, 17.vii.1991 (Deposited in ERS. ZSI, Shillong); West Bengal : 24 Parganas (209) 1♂, 12.x.1974.

Distribution : *Present records* : Manipur Nagaland and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1933c); Calcutta (Laidlaw 1918c); Howrah (Dasgupta 1957; Ram *et. al.* 1982); Manipur (Lahiri 1977b). Meghalaya (Lahiri 1987). Arunachal Pradesh (Ram & Prasad 1999). *Central India* : Bastar (Prasad 1996a).

Elsewhere : ASIA : Burma (Fraser 1933c); Bangladesh, Indonesia, Kampuchea, Malaysia, Nepal, Singapore, Thailand (Tsuda 1991), Australia (Laidlaw 1916a).

Intraspecific variation : The specimen from

Manipur differs from the description present in the Fauna of British India, as well as from the specimen from West Bengal in having a goblet shaped mark on segment 2.

Pseudagrion malabaricum Fraser
(Fig. 79)

Pseudagrion malabaricum Fraser, 1924 *Rec. Indian Mus.* 26 : 494-495 *Fauna Brit. India Odon.* **1** : 284-286; Mitra, 1983, *Ent. mon. Mag.* **119** : 29.

Material examined : West Bengal : Calcutta (52) 1♀, 5.iii.1967.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Mitra 1983); Bihar (Prasad & Varshney 1988); *Southern India* : Kodaikanal, Palni Hills (Fraser 1924b; 1931a; Kimmins 1966); Coorg, Malabar, Nilgiris (Fraser 1931a); Silent Valley (Rao & Lahiri 1983). *Western India :* Goa (Prasad 1995).

Elsewhere : ASIA : Ceylon (Lieftinck 1955, 1971b).

Remark : An addition to the fauna of eastern India (Mitra 1994).

Intraspecific variation : The specimen varies from Fraser's (1933c) description in having labrum, postclypeus and frons bluish-yellow, other marks on prothorax yellow.

Pseudagrion decorum (Rambur)
(Fig. 78)

Agrion decorum Rambur, 1842, *Ins. Nevrop.* p. 258.

Pseudagrion decorum Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 504; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 286-289.

Material examined : Orissa : Sundergarh (275) 1♂, 17.ix.1972; West Bengal : Birbhum (236) 1♂, 8.ix.1974; Calcutta (52) 1♂, 6.viii.1967. Howrah (120a) 1♀, 6.x.1974; 24 Parganas (25) 1♂, 24.iii.1973.

Distribution : *Present records* : Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta, Puri (Laidlaw 1916a); Midnapore (Dasgupta 1957); Howrah, 24 Parganas (Ram *et. al.* 1982); Bihar (Prasad & Varshney 1988). *Central India :* Bastar (Prasad 1996a); Sagar (Srivastava & Suri Babu 1997). *Western India :* Pench (Kalaskar & Kalaskar 1998). *Northern India* : Dehra Dun, Lachiwala, Mothronwala, (Bhasin 1953); *Southern India* : Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a).

Elsewhere : ASIA : Nepal (St. Quentin 1970); Omman (Schneider 1987) Bangladesh, Burma, Pakistan (Tsuda 1991).

Intraspecific variation : The specimens under study agree with the description provided by Fraser (1933c); but 3♂, from Maharashtra (Bhandara) appeared more olivaceous than eastern Indian forms.

Pseudagrion hypermelas Selys
(Fig. 76)

Pseudagrion hypermelas Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 519; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 289-292.

Pseudagrion bidentatum Morton, 1907, *Trans. Ent. Soc. Lond.* p. 307.

Material examined : West Bengal : Calcutta (52) 1♂, 21.vii.1974.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Bengal, Buxa (Bhasin 1953); Bihar, Kierpur (Laidlaw 1919) Hazaribagh (Prasad & varshney 1988); *Northern India* : Punjab (Fraser 1933c); *Central India* : Hosangabad (Fraser 1919a); Sagar (Srivastava & Suri Babu 1997); Bastar (Prasad 1996a). *Western India* : Mahabaleswar, Poona (Fraser 1924b); Maharashtra (Prasad 1996b).

Intraspecific variation : The specimen differs from the description present in the Fauna of British India, Odonata, due to its citron yellow labium and orange coloured bases of mandibles.

Pseudagrion rubriceps rubriceps Selys
(Figs. 74, 75)

Pseudagrion rubriceps Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 510 : Fraser, 1933, *Fauna Brit. India Odon.* **1** : 296-299.

Pseudagrion rubriceps rubriceps Lieftinck, 1954, *Treubia* **22** (suppl.): 60: Mitra, 1983, *Ent. mon. Mag.* **119**: 29.

Material examined: Assam: Goalpara 1♂, 25.v.1973; Bihar: Hazaribagh (126) 1♂, 29.vi.1975; 1♂, 1♀, (Copulating) 29.x.1974; 1♂, 1♀, 31.x.1974; Orissa: Bolangir (38b) 1♀, 17.xi.1972; Tripura: Agartala 1♂, 29.x.1974; Udaipur 1♂, 7.xi.1974; West Bengal: Calcutta (52) 1♂, 1♀, 30.vi.1987; 1♂, 1♀, 21.vii.1974; 1♂, 1♀, 20.xi.1966; 1♂, 1♀, 29.i.1967; Howrah 1♂, 22.i.1977.

Distribution: *Present records*: Assam, Bihar, Orissa, Tripura, West Bengal. *Past records*: INDIA: *Eastern India*: Assam (Lahiri 1979); West Bengal, Calcutta (Mitra 1983); Howrah, Hooghly (Ram *et. al.* 1982); Bihar (Prasad & Varshney 1988); Meghalaya (Lahiri 1987); *Northern India*: Chandigarh (Tyagi 1984); Uttar Pradesh (Ram *et. al.* 1983); Dehra Dun, Lachiwala, Mothronwala; Nalapani (Bhasin 1953); Garhwal Hills (Prasad 1974); Rajasthan (Prasad & Thakur 1981); *Central India*: Madhya Pradesh, Raipur (Bhasin 1953); Nagpur (Laidlaw 1919); Bastar (Prasad 1996a). *Western India*: Poona (Fraser 1924b); Maharashtra (Prasad 1996b). *Southern India*: Bolovumpattis, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Tamil Nadu (Kumar 1990).

Elsewhere: ASIA: Burma, Palon (Laidlaw 1916a; Selys 1891); Java (Laidlaw 1916a); Indo-China, Formosa, Malayasia (Fraser 1933c); Bangladesh, Hongkong, Indonesia, Nepal, Pakistan, Philippines, Thailand (Tsuda 1991).

Remark: New record from Orissa and Tripura (Mitra 1994).

Intraspecific variation: The specimens agree with the description provided by Fraser (1933c). One male specimen from Madhya Pradesh differs from the male specimen from the eastern India in having the black line on the dorsum of thorax thinner than that of eastern India form.

Pseudagrion spencei Fraser
(Fig. 68)

Pseudagrion spencei Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7**: 47-48; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 292-294; Kimmins, 1966, *Bull. Brit. Mus. Nat. Hist. (Ent.)* **18**: 214.

Material examined: West Bengal: Howrah (256) 1♂, 26.xii.1976.

Distribution: *Present record*: West Bengal. *Past records*: INDIA: *Eastern India*: West Bengal; Midnapore (Dasgupta 1957); Howrah (Ram *et. al.* 1982); Meghalaya; Shillong (Kimmins 1966); Bihar (Prasad & Varshney 1988) *Northern India*: Uttar Pradesh (Ram *et. al.* 1983). *Central India*: Sagar (Srivastava & Suri Babu 1997)

Elsewhere: ASIA: Nepal (St. Quentin 1970); Bangladesh, Hongkong, Pakistan (Tsuda 1991).

Genus *Ceriagrion* Selys

Ceriagrion Selys, 1876, *Bull. Acad. Belg.* (2) **42**: 525; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 313; Lieftinck, 1954, *Treubia* **22** (suppl.) 54; Davies, 1981, *Synop. Ext. Gen. Odon.* p.3.

Type-species: *Agrion cerinorubellum* Brauer

Distribution: India, Burma, Indo-China, Siam, China, Laos, Philippines, Malayasia, Papua, Australia, East Indies, New Guinea, Madagascar, Africa, Japan, Mocambique, Uganda, Ivory coast, Sudan, South Europe, Zambia.

Key to Species of Genus *Ceriagrion* Selys

1. Abdomen yellow 2
- Abdomen reddish or red 3
- Abdomen olivaceous 4
- Abdomen blue ..... *azureum* (Selys)

2. End segment of abdomen black .... *fallax cerinomelas* Lieftinck
- End segment of abdomen yellow .... *coromandelianum* (Fabr.)

3. Abdomen reddish brown .... *praetermissum* Lieftinck

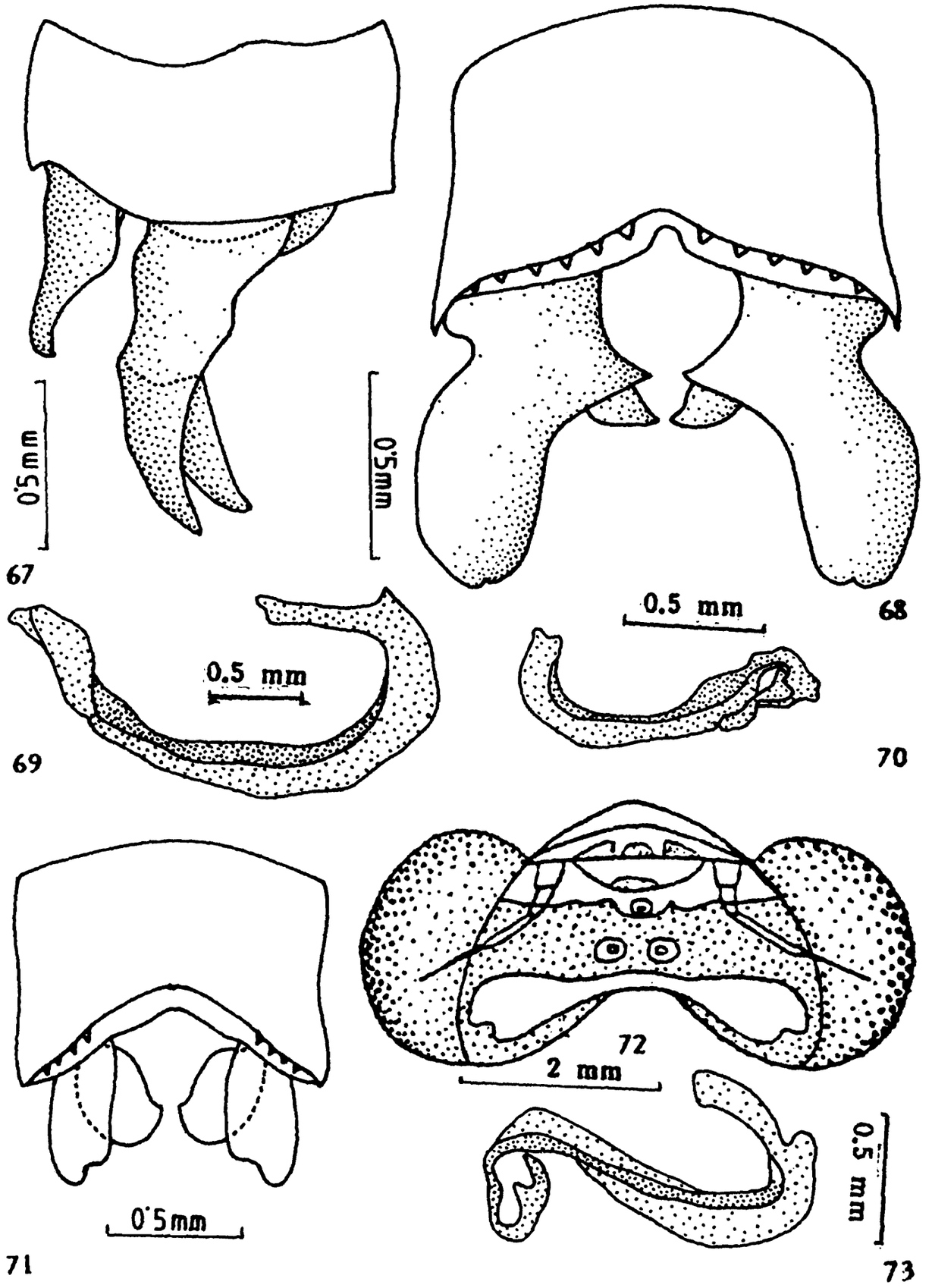


Fig. 67-73. 67. 10th abdominal segment and anal appendages of *Copera ciliata* (Selys) (Left lateral view); 68. 10th abdominal segment and anal appendages of *Pseudagrion spencei* Fraser; 69. Penis of *Copera ciliata* (Selys); 70. Penis of *Pseudagrion spencei*; 71. 10th abdominal segment and anal appendages of *Pseudagrion australasiae* Selys (Dorsal view); 72. Markings on head of *Pseudasgrion australasiae*; 73. Penis of *Pseudagrion australasiae*

- Abdomen marked with brick red .... *cerinorubellum* (Brauer)

4. Abdomen olivaceous ...*olivaceum* Laidlaw

- Abdomen bicolorous, segments 1-5 yellow, segments 6-10 brown ..... sp. indet.

Ceriagrion coromandelianum (Fabricius) (Figs. 80 & 82)

Agrion coromandelianum Fabricius, 1798, *Ent. Syst. suppl.* p. 287

Agrion cerinum Rambur, 1842, *Ins. Nevrop.* p. 279.

Ceriagrion coromandelianum Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 528; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 315-316; Asahina, 1967, *Jap. J. Zool.* 15 : 279.

Material examined : Assam : Barpeta (92) 1♂, 10.iv.1986; Goalpara (132) 1♂, 4.vi.1973; Tezpur (282) 1♂, 2♀, 2.iii.1973; 1♀, 3.iii.1973; Bihar; Hazaribagh (126) 1♂, 31.x.1974; Palamau (222) 1♂, 20.vi.1983; 1♂, 2.vii.1975; 1♂, 3.vii.1975; 1♀, 17.xi.1974; Manipur : Lamka 1♂, 21.x.1983; Moirang 3♂, 1♀, 25.v.1974; 2♂, 1♀, 28.v.1974; Nagaland : Kohima 1♂, 22.ix.1994; Orissa : Chilka (67) 1♂, 19.iii.1979; Dhenkanal (88) 1♀, 9.vi.1973; Keonjhar (159) 1♂, 24.iii.1973; Koraput (168) 1♀, 24.xi.1973; 1♀, 29.xi.1973; 1♂, 30.xi.1973; Puri (233) 1♀, 12.i.1974; Sundergarh (275) 1♂, 29.iii.1973; 1♂, 21.ix.1972; Tripura : Agartala (31) 1♂, 30.x.1974; Teliamura (101) 1♂, 13.xi.1974; West Bengal : Bankura (65) 1♀, 31.vii.1974; Birbhum (236) 4♂, 6.x.1974; 5♂, 8.x.1974; Calcutta (52) 8♂, 1♀, 26.ii.1967; 1♀, 3.iii.1967; 2♂, 3♀, 5.iii.1967; 1♂, 11.iii.1967; 1♀, 2.iv.1967; 1♂, 30.iv.1967; 2♂, 13.v.1967; 1♀, 27.v.1967; 1♂, 2.ix.1966; 1♂, 7.ix.1966; 1♂, 18.ix.1966; 1♂, 22.ix.1966; 2♂, 2.x.1966; 1♂, 9.x.1966; 1♂, 1♀, 16.x.1966; 1♂, 23.x.1966; 1♂, 24.x.1966; 2♂, 2♀, 28.x.1966; 5♂, 20.x.1966; 1♂, 27.xi.1966; Howrah (256) 7♂, 1♀, 6.x.1974; 24 Parganas (124) 1♂, 17.viii.1973; 1♂, 2♀, 20.viii.1973; 1♀, 24.viii.1973; 1♀, 26.ix.1973; (209) 5♂, 2♀, 12.x.1974; Jalpaiguri (49) 3♂, 6♀, 19-24.xii.1984.

Distribution : *Present records* : Assam, Bihar, Manipur, Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Chilka Lake (Fraser & Dover 1922; Laidlaw 1915d); Calcutta, Purneah, Sibsagar (Laidlaw 1916b); Dibrugarh (Laidlaw 1914); Buxa, Pusa (Bhasin 1953), Tripura (Lahiri 1977a); Assam, Mizoram (Lahiri 1979); Bihar (Prasad & Varshney 1988); Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Dehra Dun, Mothronwala (Bhasin 1953); Agra (Baijal & Agrwal 1955); Garhwal Hills (Prasad 1974). *Southern India* : Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a) : Tamil Nadu (Kumar 1990); Andhra Pradesh (Joseph & Satyarani 1988). *Central India* : Sagar (Srivastava & Suri Babu 1997); Bastar (Prasad 1996a), *Western India* : Goa (Prasad 1995); Pench (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1974).

Elsewhere : ASIA : Burma (Bhasin 1953; Laidlaw 1916b); Ceylon (Lieftinck 1955, 1971b); China (Needham 1930); Indo-China (Laidlaw 1916b); Nepal (Kiauta & Kiauta 1982b; St. Quentin 1970); Pakistan (Tsuda 1991).

Intraspecific variations : The specimens from Bihar and the district Koraput of Orissa differ from the specimens from other localities of eastern India, due to black spots on their abdominal segments 5-7; specimens from Manipur are lighter yellow in colour than specimens of other localities; 1♂, 1♀, from Maharashtra 1♂, from Madhya Pradesh agree with specimens from Manipur.

Ceriagrion praetermissum Lieftinck (Fig. 88)

Material examined : Manipur : Morch 1♀, 25.xi.1983. Nagaland : Dimapur. 2♀, 17.ix.1994

Distribution : *Present records* : Manipur, Nagaland. *Remark* : This has been identified tentatively, due to lack of male example confirmation' could not be made.

Intraspecific variation : The specimen from Manipur varies from the description present

in the Fauna of British India in having the postclypeus, frons, vertex greenish, yellow; occiput pale ochreous; prothorax and thorax brown; middorsal carina, humeral and lateral suture brown. The specimens from Nagaland agree with the discription present in Fraser (1933c).

Ceriagrion fallax cerinomelas Lieftinck
(Figs. 85, 87)

Ceriagrion fallax Ris, 1914, *Ent. Mitteil.* **3**(2) : 47; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 321-323.

Ceriagrion melanurum Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10**(30) : 517.

Ceriagrion cerinomelas Lieftinck, 1927, *Tijdschr. Ent.* **70** : 88.

Ceriagrion fallax cerinomelas, Tsuda, 1991, *A distributional list of World Odonata*, 1991, p. 26.

Material examined : Manipur : Signat (267) 1♂, 26.iii.1974; Mizoram : Champhai (57b) 1♂, 30.x.1991 West Bengal : Bankura (21) 1♀, 1.viii.1974.

Distribution : *Present records* : Manipur, Mizoram and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal, Sikkim (Fraser 1933c); Manipur (Lahiri 1977b); Meghalaya (Lieftinck *et. al.* 1984); Arunachal Pradesh (Prasad 1997c). *Northern India* : Simla (Fraser 1933c).

Elsewhere : ASIA : Bangladesh (Dasgupta 1957); China (Chao 1981, Needham 1930); Nepal (Kiauta 1975), Tibet (Fraser 1933c); Taiwan (Lieftinck *et. al.* 1984).

Intraspecific variations : The specimens from Manipur and Mizoram agree with the description present in the Fauna of British India, the specimen from West Bengal seems to be a teneral form.

Remark : A new record for Mizoram (Mitra 1994).

Ceriagrion olivaceum Laidlaw
(Figs. 81, 83)

Ceriagrion olivaceum Laidlaw, 1914, *Rec. Indian Mus.* **8** : 345; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 324-325.

Ceriagrion olivaceum olivaceum Mitra, 1983, *Ent. Mon. Mag.* **119** : 29.

Material examined :- Arunachal Pradesh : Seasa (259) 1♀, 21.iii.1973; Assam : Goalpara (145) 5♂, 1♀, 8.xii.1973; (132) 6♂, 2♀, 12.xii.1973; 2♂, Kaziranga 2♀, 25.xi.1974; Nowgang (219) 1♀, 4.xi.1974; Tezpur (282) 1♀, 3.iii.1973; 1♂, 13.xii.1973; Manipur : Loktak Lake (180) 1♀, 25.v.1974; Orissa : Mayurbhanj Baripada (26) 1♂, 18.iii.1973; Tripura : Agartala (31) 1♂, 31.x.1974; Teliamura (101) 1♀, 11.xi.1974; 1♀, 14.xi.1974; Udaipur 1♂, 7.xi.1974; West Bengal : Bankura (65) 1♂, 31.vii.1974; (139) 1♂, 3.viii.1974; Calcutta (52) 1♀, 11.x.1974; Darjeeling (246a) 1♀, 28.iii.1973; (238) 1♂, 2.iv.1976; (266) 1♂, 18.iv.1973; (289) 1♂, 1♀, 28.xii.1975; (276) 1♂, 3♀, 7.i.1976; 1♂, 8.i.1976.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Assam (Lahiri 1979; Laidlaw 1916b; Lieftinck 1948); Bengal (Lieftinck 1948); Buxa (Bhasin 1953); Shillong (Fraser 1924b); Mizoram (Prasad 1997c). *Central India* : Gwalior (Baijal & Agarwal 1955); Sagar (Srivastava & Suri Babu 1997); Bastar (Prasad 1996a). *Southern India* : Coorg, Deccan, Wynaad, (Fraser 1931a) : Nilgiris (Kimmins 1966). *Western India* : Poona, Satara (Fraser 1924b); Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma (Fraser 1924b, Laidlaw 1916b; Lieftinck 1948). Bangladesh, Kampuchea, Laos, Malayasia, Nepal, Thailand, Vietnam (Tsuda 1991).

Intraspecific variation : One male specimen from Assam differs from other males under study due to its reddish brown anal appendages; one male from Darjeeling differs from other males due to its bluish yellow legs; one female, from Maharashtra, has thoracic colour lighter than females of eastern India.

Ceriagrion sp. indet.
(Fig. 86)

Material examined : West Bengal : Calcutta : 1♀, 11.ix.1966.

Abdomen : 35.00 mm Hind wing : 21.00 mm

Head : Labium, genae and bases of mandibles olivaceous, labrum brown, anteclypeus, frontal part of frons olivaceous blue; post clypeus, upper part of frons as well as vertex dark brown; basal segments of antennae yellow, but other segments dark brown.

Prothorax : Yellow, *Thorax* : Middorsum dark olivaceous brown, while the lateral sides lighter in colour, anterior part and bases of legs yellow with black spines.

Wings : Hyaline, 11 postnodals in the forewings, 10 in the hindwings; Pterostigma logenze shaped, golden yellow.

Abdomen : Olivaceous yellow for the segments 1-5; and the segments 6-10 brown. Anal appendages brown, Ovipositor broad and yellow.

Remark : The specimen resembles *Ceriagrion olivaceum* Laidlaw but it is distinguishable from *C. olivaceum* due to its intense brown colouration and (1) anteclypeus, frontal part of frons olivaceous blue, (2) midorsum of thorax dark brown, (3) postnodals in forewing 11 and in hindwing 10; (4) Abdomen colour. The specimen was sent to the late Dr. M.A. Lieftinck for identification but he could not fit it to any species known so far in the genus.

Ceriagrion cerinorubellum (Brauer)
(Fig. 84)

Agrion (Pyrrhosoma) cerinorubellum Brauer, 1886, *Novara Exped. Zool.* 1 Neur, p. 59.

Ceriagrion cerinorubellum Selys, 1876, *Bull. Acad. Belg.* (2) 42 : 526; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 326-328. Lieftinck, 1954, *Treubia* **22** (suppl.) : 55.

Material examined : Orissa : Cuttack (74) 1♂, 3.xi.1973; West Bengal : Calcutta (52) 2♂, 26.ii.1967; 1♀, 5.v.1967; 24-Parganas (209) 2♂, 12.x.1974.

Distribution : *Present records* : Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Bihar, Kierpur, Purneah (Laidlaw 1916b) Calcutta (Dasgupta 1957); Tripura (Lahiri 1979); *Southern India* : Coorg, Kanara, Malabar (Fraser 1931a); *Northern India* : Kangra (Prasad 1976); Andamans (Lahiri 1998); *Central India* : Sagar (Srivastava & Suri Babu 1997). *Western India* : Goa (Prasad 1995); Maharashtra (Prasad 1996b). Little Andaman (Lahiri 1998).

Elsewhere : ASIA : Borneo, Ceylon, Indo-China, Java, (Lieftinck 1971b) Singapore (Kiauta & Kiauta 1982a); Bangladesh, Burma, Indonesia, Kampuchea, Malayasia, Pakistan, Thailand, Vietnam (Tsuda 1991).

Remark : An addition to the fauna of Orissa (Mitra 2000).

Ceriagrion azureum (Selys)
(Fig. 90)

Pseudagrion azureum Selys, 1891, *Ann. Mus. Civ. Genova* (2) 10(30) : 513.

Ceriagrion azureum, Fraser, 1933, *Fauna Brit. India Odon.* **1** : 328.

Material examined : Arunachal Pradesh : Namdhapa (211a) 2♂, 1♀, 6.iv.1981; Mizoram : Champhai (57b) 4♂, 4♀, 29.x.1991, West Bengal : Bankura (65) 2♂, 1♀, 31.vii.1974.

Distribution : *Present records* : Arunachal Pradesh, Mizoram and West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh (Lahiri 1985), Khasia Hills (Fraser 1933c).

Elsewhere : ASIA : Bangladesh, Burma, China, Laos, Nepal, Thailand (Tsuda 1991).

Remark : A new record from Mizoram (Mitra 1994).

Genus ***Cercion*** Navas

Cercion Navas, 1907, *Broteria* **6** : 55 : Davies, 1981, *Synop. Ext. Gen. Odon.* p. 4.

Type-species : *Agrion lindenii* Selys

Distribution : India, Japan, E. Asia, Europe, Mindanao, Spain, China, Nepal.

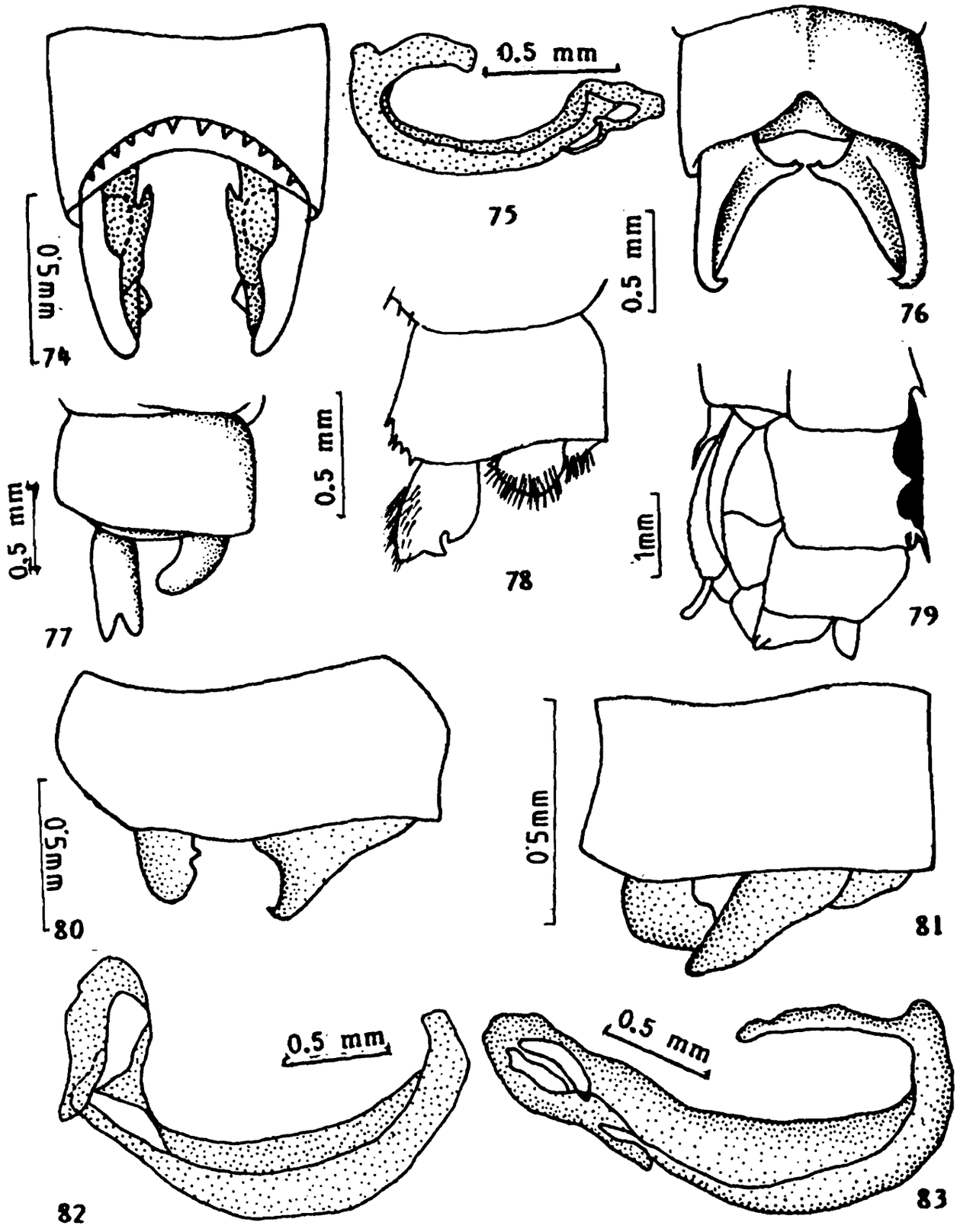


Fig. 74-83. 74. 10th abdominal segment and anal appendages of male *Pseudagrion r. rubriceps* Selys (Dorsal view); 75. Penis of the same; 76. 10th abdominal segment and anal appendages of male *Pseudagrion hypermelas* Selys (Dorsal view); 77. 10th abdominal segment and anal appendages of male *Pseudagrion microcephalum* (Rambur) (Right lateral view); 78. 10th abdominal segment and anal appendages of male *Pseudagrion decorum* (Right lateral view); 79. End part of the abdomen, anal appendages and genitalia of female *Pseudagrion malabaricum* Fraser (Left lateral view); 80. 10th abdominal segment and anal appendages of male *Ceriagrion coromandelianum* (Fabricius); 81. 10th abdominal segment and anal appendages of male *Ceriagrion olivaceum* Laidlaw (Right lateral view); 82. Penis of *Ceriagrion coromandelianum*; 83. Penis of *Ceriagrion olivaceum*

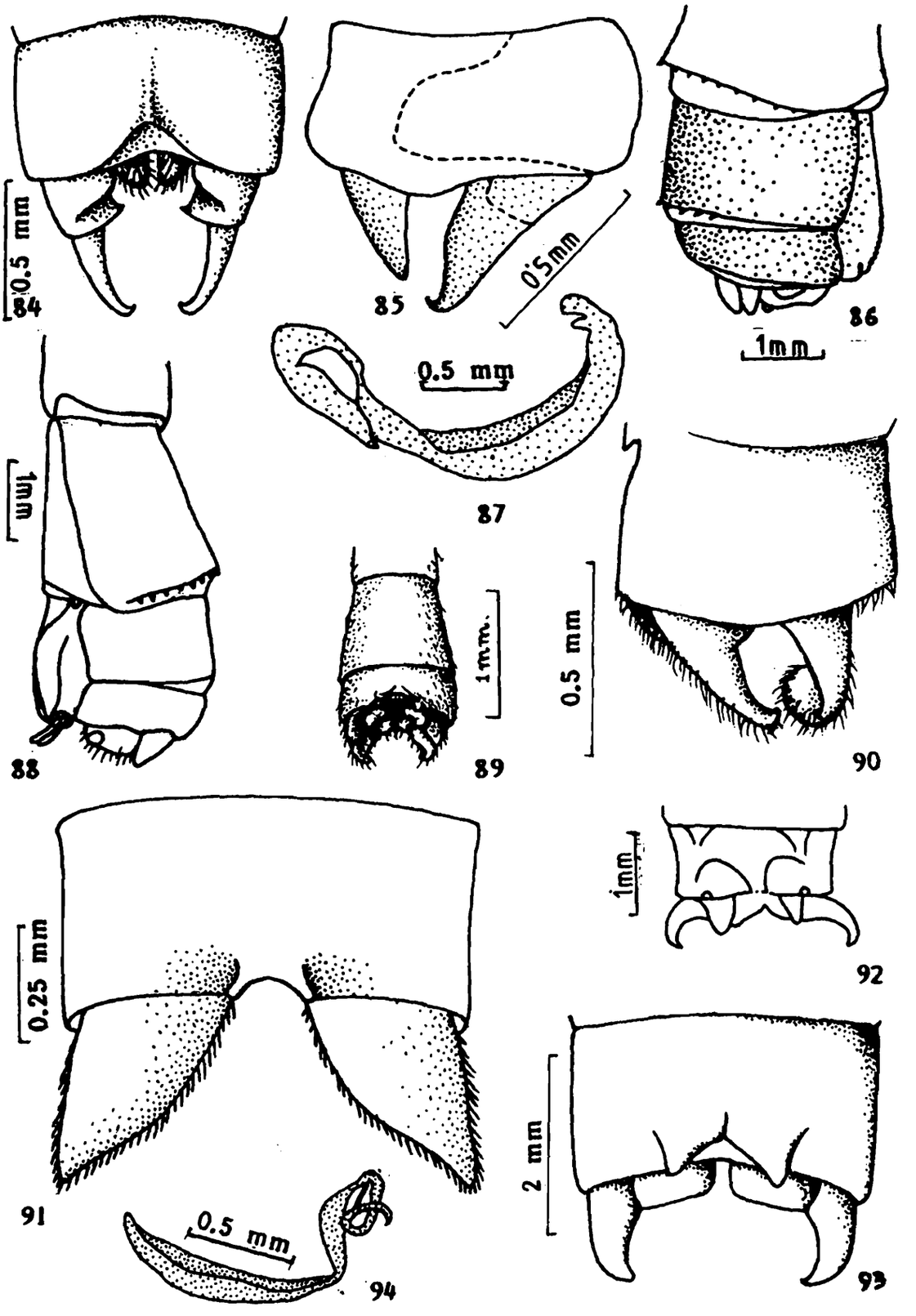


Fig. 84-94. 84. 10th abdominal segment and anal appendages of male *Ceriagrion cerinorubellum* (Brauer) (Dorsal view); 85. 10th abdominal segment and anal appendages of male *Ceriagrion fallax cerinomelas* Lieftinck (Right lateral view); 86. 9th and 10th abdominal segments and appendages and genitalia of female *Ceriagrion* sp. (Right lateral view); 87. Penis of *Ceriagrion fallax cerinomelas;* 88. 9th and 10th abdominal segments and anal appendages and genitalia of female *Ceriagrion praetermissum* Lieftinck (Left lateral view); 89. 9th and 10th abdominal segments and anal appendages of male *Ischnura rufostigma mildredae* Fraser (Dorsal view); 90. 10th abdominal segment and anal appendages of male *Ceriagrion azureum* (Selys) (Left lateral view); Fraser (Dorsal view); 91. 10th abdominal segment and anal appendages of male *Ischnura a. aurora* Brauer (Dorsal view); 92. 10th abdominal segment and anal appendages of *Ischnura e. elegans* (Vander Linden) (Dorsal view); 93. 10th abdominal segment and anal appendages of *Ischnura senegalensis;* 94. Penis of *Ischnura a. aurora*

Key to Species of Genus *Cercion* Navas

- 7-8 postnodals in the forewing;
- 6-7 in the hindwings ..... *malayanum* (Selys)
- 9-10 postnodals in the forewing;
- 7-8 in the hindwings ..... *calamorum dyeri* (Fraser)

Cercion malayanum (Selys)

Enallagma? malayanum Selys, 1876, *Bull. Acad. Belg.* (2) **4** : 536.

Enallagma malayanum, Fraser, 1936, *Fauna Brit. India Odon* 1 : 375-376.

Coenagrion malayanum, Lieftinck, 1954, *Treubia* **22** (suppl.) : 69.

Cercion malayanum, Kiauta, 1975, *Cytotaxonomy of Dragonflies* p. 43.

Material examined : Manipur : Ukhrul (292) 1♂, 3.x.1975; West Bengal : Birbhum (236) 1♂, 8.x.1974; (260) 1♂, 1♀, 9.x.1974; Calcutta (52) 1♀, 8.viii.1966; 2♂, 7.ix.1966; 1♀, 22.ix.1966; 2♀, 2.xi.1966; 24 Parganas (124) 1♀, 20.viii.1973, 1♂, 22.viii.1973; 1♀, 2.x.1973.

Distribution : *Present records* : Manipur and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Lahiri & Mitra 1976); *Northern India* : Rajasthan (Bose & Mitra 1976); *Central India* : Nagpur (Fraser 1933c, Laidlaw 1919). Sagar (Srivastava & Suri Babu 1997) *Western India* : Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma (Bhasin 1953); Ceylon (Fraser 1933c); China (Needham 1930); Java (Fraser 1933c, Schmidt 1934); Nepal (Kiauta 1974; 1975); Thailand (Asahina 1982b).

Remark : New record from eastern India (Mitra 1994).

Cercion calamorum dyeri (Fraser)
(Fig. 109)

Argiocnemis gravelyi Fraser, 1919, *Rec. Indian Mus.* **16** : 451.

Argiocnemis dyeri Fraser, 1919 *Rec. Indian Mus.* 16 : 451-452.

Cercion calamorum dyeri Lieftinck *et. al.*, 1984, *Cat. Taiwanese Dragonflies* p. 23.

Material examined : Orissa : Bolangir (38b) 1♀, 9.xi.1972; 2♀, 14.xi.1972; Chilka Lake (67) 1♀, 19.iii.1966; Sundergarh (275) 1♂, 21.ix.1972; West Bengal : Malda (186a) 1♂, 13.x.1988.

Distribution : *Present records* : Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Howrah (Ram *et. al.* 1982); Ranchi (Fraser 1924g); *Central India* : Central Provinces (Fraser 1919a); *Southern India* : Coorg; Deccan, Malabar, Nilgiris (Fraser 1931a); Western Ghats (Fraser 1933c).

Elsewhere : ASIA : Burma, Korea, China, Sumtra (Asahina 1960) Malayasia (Lieftinck 1960); Taiwan (Lieftinck *et. al.* 1984); Nepal (Tsuda 1991).

Remark : New record from Orissa (Mitra 2000).

N.B. : *gravelyi* has priority over *dyeri* but Fraser both as discoverer and first reviser has given priority to *dyeri* over *gravelyi* in the Fauna of British India.

Genus ***Aciagrion*** Selys

Aciagrion Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10**(30) : 509; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 333; Lieftinck, 1954, *Treubia* 22 (suppl.); 76; Davies, 1981; *Synop, Ext. Gen. Odon.* p. 5; Tsuda 1991 *A distributional list of World Odonata, 1991* p. 17

Type-species : *Pseudagrion hisopa* Selys

Distribution : India, Burma, Ceylon, East Indies, Africa, Zambia, Gabon, Uganda, Malaya, Japan, Ryukyu Is., Indo-China, Rhodesia, New-Guinea, Queensland.

Key to Species of Genus *Aciagrion* Selys

1. Black on dorsum of thorax 2
- Brown on dorsum of thorax ..... *pallidum* Selys
2. Greenish yellow antehumeral stripe ..... *occidentale* Laidlaw
- Pale blue antehumeral stripe 3
- Lilaceous violet antehumeral stripe ..... *hisopa hisopa* (Selys)

3. Segment 10 of abdomen black .... *approximans* (Selys)
- Segment 10 of abdomen blue with black mark ..... *olympicum* Laidlaw
- Segment 10 of abdomen azure blue without any black mark .. *azureum* Fraser

Aciagrion occidentale Laidlaw (Fig. 100)

Aciagrion hisopa Selys, race *occidentale* Laidlaw, 1919, *Rec. Indian Mus.* **16** : 186.

Aciagrion paludensis Fraser, 1922, *J. Bombay nat. Hist. Soc.* **28** : 698

Aciagrion occidentalis, Fraser, 1923 *J. Bombay nat. Hist. Soc.* **29** : 749.

Aciagrion occidentale, Fraser, 1933, *Fauna Brit. India Odon.* 1 : 335-337.

Material examined : Orissa : Mayurbhanj (264a) 1♀, 28.i.1986; Sundergarh (275) 1♂, 22.ix.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Central India :* Madhya Pradesh (Prasad 1996a). *Southern India* :Throughout southern India (Fraser 1933c) : Cochin, Kanara, Parambikulum, Trichur (Laidlaw 1919); Bolovumpattis, Coorg, Malabar, Nilgiris (Fraser 1931a); *Western India* : Bombay (Laidlaw 1919); Goa (Prasad 1995); Maharastra (Prasad 1996a).

Elsewhere : ASIA : Ceylon (Fraser 1933c; Laidlaw 1924; Lieftinck 1971b).

Intraspecific variation : The specimens vary from Fraser's (1933c) description due to their pale olivaceous labium and blackish brown anal appendages.

Aciagrion olympicum Laidlaw (Fig. 103)

Aciagrion olympicum Laidlaw, 1919, *Rec. Indian Mus.* 16 : 171; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 337-339.

Material examined : Arunachal Pradesh : Subansiri (294) 1♂, 1♀, 13.v.1966; (123) 1♂,15.v.1966; Sikkim : Rabangla (234) 1♂, 6.x.1988; Tumin (287a) 1♀, 25.ix.1988; 6♀, 29.ix.1988; West Bengal; Darjeeling (247) 1♂, 29.iii.1973; Jalpaiguri (49) 8♂, 3♀, 11-23.xii.1984.

Distribution : *Present records* : Arunachal Pradesh, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling (Laidlaw 1919, Fraser 1933c); Sikkim (Fraser 1933c); Arunachal Pradesh (Prasad 1997b).

Remark : A new record from Arunachal Pradesh (Mitra 1994).

Intraspecific variation : Only male specimens vary from Fraser's (1933c) description in having clypeus, bases of mandibles, frons right upto the roots of antennae and antehumeral stripe whitish blue; in the specimens from Jalpaiguri ground colour is golden and the isthmus of the postocular spots absent.

Aciagrion hisopa hisopa (Selys) (Fig. 99)

Pseudagrion? hisopa Selys, 1876, *Bull. Acad. Belg.* (2) 42 : 509.

Aciagrion hisopa Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10** (30) : 511 Fraser, 1933, *Fauna Brit. India Odon.* **1** : 340-342.

Aciagrion hisopa hisopa Lieftinck, 1954, *Treubia* 22 (suppl.) : 76

Material examined : Sikkim : Chulung (72) 3♂, 20.x.1977; Rangdom (242) 1♂, 19.x.1977. West Bengal : Bankura (65) 1♀, 31.vii.1974.

Distribution : *Present records* : Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling (Selys 1891). *Central India :* Indravati Tiger Reserve (Mitra 1995b). *Southern India :* Coorg, Deccan Nilgiris, Travancore (Fraser 1931a); *Western India* : Mahabaleswar, Satara, Poona (Fraser 1933c); Maharashtra (Prasad 1996a).

Elsewhere : ASIA : Burma (Laidlaw 1924; Lieftinck 1948; Selys 1891); China (Klots 1947; Needham 1930); Malacca (Selys 1891) Malayasia (Fraser 1933c; Lieftinck 1954) Siamese Malay, Singapore (Laidlaw 1924).

Japan (Lieftinck 1948). Bangladesh, Ceylon, Malayasia, Nepal, Thailand, Vietnam (Tsuda 1991), Pakistan (Khaliq & Maulla 1999).

Aciagrion approximans (Selys)

Pseudagrion microcephalum race *approximans* Selys, 1876, *Bull. Acad. Belg.* (2) 42 : 507.

Aciagrion approximans, Fraser, 1933, *Fauna Brit. India Odon.* 1 : 342-344; Tsuda 1991, *A distributional list of World Odonata, 1991*, p. 17.

Aciagrion tillyardi, Lahiri, 1987, *Rec. zool. Surv. Occ. pap.* **99** : 100-101.

Material examined : Manipur : Signat (267) 2♂, 26.iii.1974; Sikkim : Chulung (72) 1♂, 20.x.1977.

Distribution : *Present records* : Manipur and Sikkim. *Past records* : INDIA : *Eastern India* : Shillong, Tura (Laidlaw 1924) Cherrapunje (Laidlaw 1919); Nagaland (Bhasin 1963); Khasia Hills (Fraser 1933c); Arunachal Pradesh (Lahiri 1979); Manipur (Lahiri 1977b); West Bengal (Sinha & Chakraorty 1996).

Remark : An addition to the fauna of Sikkim (Mitra 1994).

Aciagrion pallidum Selys
(Figs. 101, 102)

Aciagrion pallidum Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10**(30) : 512 Fraser, 1933, *Fauna Brit. India Odon* **1** : 344-345.

Material examined : Assam : Barpeta (92) 1♀, 10.iv.1986; Goalpara (145) 1♂, 9♀, 8.xii.1973; 3♀, 10.xii.1973; 1♂, 4♀, 12.xii.1973; 2♀, 13.xii.1973 (132) 5♀, 15.xii.1973; Bihar : Palamau (222) 2♂, 5♀, 17.xi.1974; Singhbhum (24) 7♂, 5♀, 7.xii.1974; Orissa : Bolangir (38b) 1♀, 17.xi.1972; 1♂, 2♀, 9.xi.1972; Cuttack (74) 1♂, 6.xii.1965; 2♀, 17.1.1974; Ganjam (104) 2♂, 1♀, 31.xii.1973; Puri (233) 1♀, 30.xii.1973; 1♂, 1♀, 10.1.1974; Mayurbhanj (264a) 1♀, 28.i.1986; Sambalpur (252) 1♂, 23.xi.1973; Tripura : Ambassa 1♂, 16.xi.1974; Teliamura (101) 1♀, 2.xi.1974; West Bengal : Darjeeling (246a) 1♀, 3.i.1973; 5♂, 5♀, 5.i.1973; 1♂, 25.iii.1973; 1♂, 2♀, 29.iii.1973; (149) 1♀, 31.xii.1973; (34) 1♀, 19.xii.1973; (109) 1♂, 20.xii.1973; (238) 5♂, 9♀, 6.i.1974; (214) 2♂, 6♀, 7.i.1974; 5♂, 1♀, 8.i.1974; (289) 4♂, 8♀, 28.xii.1975; (276) 1♂, 1♀, 7.i.1976; Jalpaiguri 3♂, 4♀, 19-24.xii.1974; (49) : 3♂, 4♀, 23.xii.1984.

Distribution : *Present records* : Assam, Bihar, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Assam (Lahiri 1979; Laidlaw 1924); Dibrugarh, N.E. Assam (Laidlaw 1914); Darjeeling district, Nurbong, bottom of Mahanadi Valley (Laidlaw 1919); Sikkim (Lieftinck 1948); Arunachal Pradesh (Lahiri 1979). Bihar (Prasad & Varshney 1988); Meghalaya (Lahiri 1987); *Western India* : Poona; Satara, Western Ghats (Fraser 1933c); Khandala, Mahabaleswar (Fraser 1924b); Mormugao, Portugeese India (Laidlaw 1919); North Kanara (Laidlaw 1924); Goa (Prasad 1995); Maharastra (Kalaskar & Kalaskar 1998). *Central India* : Nagpur (Laidlaw 1924); Madhya Pradesh (Mitra 1995b); *Southern India* : Deccan, (Fraser 1931a); *Northern India* : Uttar Pradesh (Kumar 1982; Ram *et. al.* 1983). Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Burma (Laidlaw 1924; Lieftinck 1948); Copabo (Selys 1891); Nepal (Asahina 1955); Kampuchea, Thailand, Vietnam (Tsuda 1991).

Remark : New record from Orissa and Tripura (Mitra 1994).

Intraspecific variations : One male specimen from Assam varies from Fraser's (1933c) description and male specimens from other states eastern India since it has dirty white labium and occiput brown. The antehumeral stripe in one female from Madhya Pradesh is intrrupted by ground colour in contrast with uninterrupted humeral stripe among female specimens from eastern India. In one male specimen from Jalpaiguri ventral part of thorax, prothorax and legs are yellow; segment 1 with blue spot.

Aciagrion azureum Fraser

Aciagrion azureum Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* 7(7): 51: Fraser, 1933, *Fauna Brit. India Odon* **1**: 339-340.

Material examined: Assam: Barpeta (3) 1♀, 6.iv.1986. Doimari (92) 2♂, 2♀, 10.iv.1986.

Distribution: *Present record*: Assam. *Past records*: INDIA: *Eastern India*: Assam, Margharita (Fraser 1933c; Kimmins 1966).

Elsewhere: Burma (Tsuda 1991).

Genus *Ischnura* Charpentier

Ischnura Charpentier, 1840, *Lib. Europ.* p. 20; Fraser, 1933, *Fauna Brit. India Odon* 1: 346; Lieftinck, 1954, *Treubia* 22 (suppl.); 74; 1976, *Cah. O. R. S. T. O. M. Ser. Hydrobiol.* 10(3): 189; Davies 1981, *Synop. Ext. Gen. Odon.* p. 6; *Micronympha* Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 140.

Type-species: *Ischnura pumilo* Charpentier

Distribution: India, Burma, Ceylon, Africa, Guatemala, New-Guinea, Samoa, Brasil, Puerto Rico, Society Is., North America, Mexico, Crete, Europe to Asia, Arabia, Madagascar, Ethiopea, Poland, Columbia, Turkey Algeria, Morocco, Queensland, Spain, Tahiti, Austrelia.

Key to species of Genus *Ischnura* Charpentier

1. Pterostigma with yellow distal border.... .....*rufostigma mildredae* Fraser
- Pterostigma with reddish color..... 2
- Pterostigma with bluish color 3
2. Pterostigma of forewing bright brick red .....*rufostigma rufostigma* Selys
- Pterostigma of forewing reddish orange .....*rufostigma annandalei* Laidlaw
- Pterostigma of forewing with rosy proximal half and white distal half..... .....*aurora aurora* Brauer
3. Segment 10 with blue spot on dorsum... .....*forcipata* Morton
- Segment 10 without blue spot on dorsum 4
4. Segment 2 metallic blue ....*senegalensis* (Rambur)
- Segment 2 non-metallic ....*elegans elegans* (Vander Linden)

Ischnura senegalensis (Rambur) (Fig. 93)

Agrion senegalensis Rambur, 1842, *Ins. Névrop.* p. 276.

Ischnura senegalensis Selys, 1876, *Bull. Acad. Belg.* (2) **41**: 273; Ris, 1915, *Tijdschr. Ent.* **58**: 9; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 348-351; Lieftinck, 1954, *Treubia* **22** (suppl.): 74.

Material examined: Bihar: Hazaribagh (126) 1♂, 1♀, 29.x.1974; 1♀, 30.x.1974; Singhbhum (24) 1♂, 8.xii.1974; Mizoram (228a) 1♀, 23.x.1991; Nagaland: Zunheboto 1♀, 10.vii.1991 (Deposited in ERS. ZSI. Shillong); Orissa: Balasore (14) 2♂, 8.xii.1955. 18.ix.1966; 3♀, 2.x.1966; 2♂, 3.x.1966; 3♂, 3♀, 8.x.1966; 1♂, 12.x.1966; West Bengal Calcutta (52) 1♂, 1♀, 16.x.1966; 1♀, 23.x.1966; 4♂, 4♀, 2.xi.1966; 2♂, 3♀, 27.xi.1966; 2♂, 2♀, 4.xii.1966; 4♂, 11.xii.1966; 3♂, 4♀, 25.xii.1966; 6♂, 1♀, 1.ii.1967; 4♂, 3♀, 29.i.1967; 1♂, 4♀, 12.ii.1967; 2♀, 5.iii.1967; 24 Parganas: (124) 1♂, 20.viii.1973; 5♂, 25.viii.1973; (209) 6♂, 12.x.1974; (195a) 2♂, 2♀, 15.ix.1983; (10a) 2♂, 18.ix.1983.

Distribution: *Present records*: Bihar, Mizoram Nagaland and West Bengal. *Past records*: INDIA: *Eastern India*: Calcutta (Dasgupta 1957); Chilka Lake (Laidlaw 1915d) Puri (Laidlaw 1916b); Manipur (Lahiri 1977b); Bihar (Prasad & Varshney 1988). *Northern India*: Rajasthan (Bose & Mitra 1976); Chandigarh (Tyagi 1984). *Western India*: Bombay (Pinhey 1962); Pench (Kalaskar & Kalaskar 1998). *Southern India*: Coorg, Deccan, Malabar, Nilgiris (Fraser 1931a); *Central India*: Sagar (Srivastava & Suri Babu 1997).

Elsewhere: ASIA: Burma, Bhamo, Mandalaya, Puepoli (Selys 1891), Rangoon (Laidlaw 1916b); China (Chao 1981, Needham 1930, Rowe 1981); Formosa (Needham 1930);

Thailand (Kiauta & Kiauta 1983b); Taiwan (Lieftinck *et. al.* 1984); Micronesia (Lieftinck 1962); Ceylon, Moluccas, New Guinea (Lieftinck 1971b); Philippines (Kiauta & Kiauta 1983a); Iran, Japan, Afghanistan, Bangladesh, Hongkong, Kampuchea, Ceylon, Vietnam (Tsuda 1991). AFRICA : Throughout African continent (Pinhey 1962); Senegal (Pinhey 1962); Mauretiana (Dumont 1976); Garamba National Park (Pinhey 1966b); Mocambique (Pinhey 1981); Malawi (Pinhey 1966a; 1979b); Annoban (Pinhey 1974a); Angola (Pinhey 1975); Ngamiland (Pinhey 1967); Cape to Mediterranean Africa (Pinhey 1984); Tanzania (Pinhey & Pinhey 1984); Somaliland (Carfi 1974); Madagascar (Carfi & Terzani 1991).

Remark : New record from Mizoram (Mitra 1994).

Ischnura elegans elegans (Vander Linden) (Fig. 92)

Agrion elegans Vander Linden, 1823, *Opus. Sci.* 4 : 104; *Ischnura elegans*, Selys, 1876, *Bull. Acad. Belg.* (2) 41 : 277; Fraser 1933, *Fauna Brit. India Odon.* 1 : 351-354; Mitra, 1983, *Ent. mon. Mag.* 119 : 29.

Material examined : Orissa : Cuttack (74) 1♂, 6.xii.1965 : West Bengal : Calcutta (52) 1♂, 11.xii.1966; 2♂, 1.i.1967.

Distribution : *Present records* : Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Mitra 1983); *Southern India* : Andhra Pradesh (Joseph & Satyarani 1988).

Elsewhere : ASIA : China (Needham 1930); Pakistan; North West Frontier Provinces (Fraser 1919c); Iraq (Bhasin 1953). EUROPE : Germany (Benken 1980; Korman 1966); Kantons Graubunden (Schiess & Denarmels 1979); Greece (Hämäläinen 1983).

Remark : An addition to the Oriental fauna.

Ischnura forcipata Morton (Figs. 96, 182)

Ischnura forcipata Morton, 1907, *Trans. Ent. Soc. Lond.* p. 306; Fraser, 1933, *Fauna Brit. India Odon.* 1 : 354-357.

Ischnura gangetica Laidlaw, 1913, *Entomologist* : p. 235.

Material examined : Orissa : Bolangir (38b) 1♂, 9.xi.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Eastern India* : Bengal (Fraser 1933c); Calcutta (Ram *et. al.* 1982) : *Northern India* : Uttar Pradesh (Kumar 1982); Almora, Samkhet, Sobla, Mussorie, Keyear Kuli, Nainital, Sat Tal (Bhasin 1953); Kumaon (Laidlaw 1916b); Punjab, Simla, Mussorie (Fraser 1933c); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Quetta, Baluchistan (Fraser 1933c). Nepal (Kiauta 1975), Afghanistan, Bangladesh, Iran, Nepal (Tsuda 1991).

Intraspecific variations : The specimen varies from the description in the Fauna of British India in having labium yellowish white, labrum olivaceous, legs whitish yellow, abdominal segments (7-10) olivaceous.

Ischnura aurora aurora Brauer (Figs. 91, 94, 190)

Ischnura aurora Brauer, 1865, *Verh. zool.-bot. Ges. Wien.* **15** : 510.

Ischnura delicata, Fraser, 1933, *Fauna Brit. India. Odon.* **1** : 360-362.

Ischnura aurora aurora, Tsuda, 1991, *A distributional list of World Odonata*, 1991. p. 34.

Material examined : Assam : Goalpara (118) 1♂, 20.vi.1973; (145) 4♂, 1♀, 23.xii.1973; Bihar : Hazaribagh (126) 1♂, 1♀, 29.x.1974; 1♀, 30.x.1974; Palamau (222) 1♀, 3.vii.1975; Singhbhum (24) 1♂, 4♀, 8.xii.1974; Manipur : Imphal (130) 1♂, 12.xi.1983; Mizoram : Champhai (57b) 8♂, 1♀, 29.x.1991; Nagaland : Dimapur 1♂, 18.ix.1994; Orissa : Bolangir (38b) 2♂, 9.xi.1973; 1♂, 8.xi.1973; Sambalpur (252) 1♂, 31.x.1972; Sikkim : Ranipool (246) 2♂, 12.x.1988; West Bengal : Bankura (65) 3♂, 1♀, 31.vii.1974; Birbhum (236) 1♀, 8.x.1974; Burdwan (10) 1♂, 1♀, 26.x.1968; Calcutta (52) 1♂, 16.x.1966; 1♂, 23.x.1966; 1♂, 29.i.1967; Darjeeling (245) 1♂, 30.v.1974; Jalpaiguri (49) 4♂, 20.xii.1984.

Distribution : *Present record* : Assam, Bihar, Manipur, Mizoram, Nagaland, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Bengal (Selys 1891), Manipur (Lahiri 1977b); Arunachal Pradesh, Assam (Lahiri 1979); Barkuda Island (Fraser & Dover 1922); Bihar (Prasad & Varshney 1988); Meghalaya (Lahiri 1987); *Northern India* : Uttar Pradesh (Kumar 1982); Dehra Dun, Mothronwala, Nalapani, Gorakhpur, Surpur (Bhasin 1953); Garhwal Hills (Prasad 1974); Rajasthan (Prasad & Thakur 1981); *Southern India* : Conoor, Ooty Lake (Fraser 1924b); Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Silent Valley (Rao & Lahiri 1983); Tamil Nadu (Kumar 1990); *Central India* : Nagpur (Laidlaw 1919); Sagar (Srivastava & Suri Babu 1997). *Western India* : Goa (Prasad 1995); Pench (Kalaskar & Kalaskar 1998).

Elsewhere : ASIA : Burma, Iado (Selys 1891), Ceylon (Laidlaw 1916b, Lieftinck 1971b; Selys 1891); Nepal (Kaiuta 1975; St. Quentin 1970); China (Needham 1930); Afghanistan, Bangladesh, Indonesia, Iran, Japan, Pakistan, Philippines, Thailand, Taiwan (Tsuda 1991) : Australia (Laidlaw 1916b; Selys 1891); Micronesia (Lieftinck 1962); Newzealand (Penniket 1966); Tahiti (Selys 1891).

Remark : A new record from Mizoram (Mitra 1994).

Intraspecific variations : The specimens do not vary among themselves and from the description given by Fraser (1933c); but male specimens from Bihar and Orissa agree with specimens from Madhya Pradesh due to azure blue mark on segment 8-10.

Ischnura rufostigma Group

Here it is classified according to Vick (1986).

Ischnura rufostigma rufostigma Selys (Figs. 104, 105)

Ischnura rufostigma Selys, 1876, *Bull. Acad. Belg.* (2) **41** : 283; Fraser 1933, *Fauna Brit. India Odon.* **1** : 362-364.

Ischnura rufostigma rufostigma, Tsuda, 1991, *A distributional list of World Odonata* 1991, p. 36.

Material examined : Manipur : Singnat (267) 1♂, 26.iii.1974; Ukhrul (292) 1♂, 4.iii.1975; Nagaland : Phek Road 3♂, 24.iii.1997; West Bengal : Calcutta (52) 1♂, 31.x.1975.

Distribution : *Present records* : Manipur, Nagaland and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta, Bengal, Assam (Laidlaw 1916b). Dibrugarh, N.E. Assam (Laidlaw 1914); Manipur (Lahiri 1977b); Meghalaya (Lahiri 1987). *Central India* : Sagar (Srivastava & Suri Babu 1997).

Elsewhere : ASIA : Burma (Bhasin 1953); China (Needham 1930).

Intraspecific variations : The specimens vary from the description provided by Fraser (1933c) in having labium olivaceous yellow; labrum olivaceous, vertex dark grey.

Ischnura rufostigma annandalei Laidlaw (Fig. 97)

Ischnura annandalei Laidlaw, 1919, *Rec. Indian Mus.* **16** : 175-177 Fraser, 1933, *Fauna Brit. India Odon.* **1** : 364-366.

Ischnura rufostigma annandalei, Tsuda, 1991, *A distributional list of World Odonata*, 1991, p. 36.

Material examined : Manipur : Moirang (202) 2♂, 14♀, 15-20 iii.1974; Orissa : Bolangir (38b) 3♂, 5.x.1972; 1♀, 10.x.1972; Sundergarh (275) 1♂, 21.ix.1972.

Distribution : *Present records* : Manipur and Orissa. *Past records* : INDIA : *Eastern India* : Manipur (Lahiri 1977b); *Northern India* : Rajasthan (Bose & Mitra 1976).

Elsewhere : ASIA : Burma (Fraser 1933c), Inle Lake (Laidlaw 1919) Nepal (Kiauta 1975); Bangladesh, China, Laos, Thailand, Vietnam (Tsuda 1991).

Remark : An Addition to the fauna of Orissa (Mitra 2000).

Intraspecific variation : The specimens agree with the description present in the Fauna of

British India; but male specimens from Rajasthan and Manipur differ from specimens of Orissa in having 6 postnodals in the forewing.

Ischnura rufostigma mildredae Fraser
(Fig. 89)

Ischnura mildredae Fraser, 1927, *Rec. Indian Mus.* **29** : 87-88, Fraser, 1933, *Fauna Brit. India Odon.* **1** : 366-368.

Material examined : Manipur : Keibul (157) 1♂, 26.i.1975; 1♀, 7.ii.1975; Orissa : Bolangir (38b) 4♂, 9.xi.1972.

Distribution : *Present records* : Manipur, Orissa. *Past records* : INDIA : *Eastern India* : Manipur (Mitra 1975); Arunachal Pradesh (Prasad 1997b).

Elsewhere : ASIA : Burma (Fraser 1927c); Nepal (St. Quentin 1970); Hongkong (Tsuda 1991).

Remark : New record from India

Intraspecific variation : The specimens differ from the description provided by Fraser (1933c) since they have white labium and olivaceous labrum.

Genus ***Rhodischnura*** Laidlaw

Rhodischnura Laidlaw, 1919, *Rec. Indian Mus.* **16** : 171.

Type-species : *Rhodischnura nursei* (Morton)

Distribution : India, Pakistan and Bangladesh.

Rhodischnura nursei (Morton)
(Figs. 95, 98)

Ischnura nursei Morton, 1907, *Trans. Ent. Soc. Lond.* pp. 306-307.

Rhodischnura nursei Laidlaw, 1919, *Rec. Indian Mus.* 16 : 171.

Material examined : Orissa : Bolangir (38b) 1♂, 9.xi.1972.

Distribution : *Present record* : Orissa. *Past records* : INDIA : *Eastern India* : Barkuda Island (Fraser & Dover 1922); *Northern India* : Dehra Dun, Mothronwala (Bhasin 1953) Rajasthan (Tyagi & Miller 1991). *Central India* : Nagpur (Fraser 1930); Sagar (Srivastava & Suri Babu 1997). *Southern India* : Coorg, Malabar (Fraser 1931a).

Elsewhere : ASIA : Bangladesh (Tsuda 1991); Karachi, Hyderabad and Sind (Fraser 1933c).

Genus ***Enallagma*** Charpentier

Enallagma Charpentier, 1840, *Lib. Europ.* p. 21; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 371; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 5.

Type-species : *Enallagma cyathigerum* Charpentier

Distribution : Afghanistan, Burma, China, Cameroons, Caucasus, Central, North and South America, Cuba, Germany, India, Japan, Madagascar, Mongolia, Mexico, Maldives, Rhodesia, Russia, Sri Lanka, West Indies, Zanzibar.

Enallagma parvum Selys
(Fig. 108)

Enallagma parvum Selys, 1876, *Bull. Acad. Belg.* (2) **41** : 537; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 376-378.

Material examined : Assam : Barpeta (92) 1♀, 10.iv.1986; Bihar : Hazaribagh (126) 1♂, 29.x.1974; Manipur : Ukhrul (292) 1♀, 3.x.1975; Orissa : Bolangir (38b) 1♂, 16.xi.1972; Puri (233) 1♀, 30.xii.1973; Cuttack (74) 2♀, 2.xii.1965; West Bengal : Bankura (38a) 1♀, 4.vii.1974; Calcutta (52) 1♂, 27.xi.1966; 1♂, 11.xii.1966; 1♂, 5.iii.1967; 1♀, 8.iii.1967; 1♂, 5.vi.1967.

Distribution : *Present records* : Assam, Bihar, Manipur, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Sikkim, Assam, Duars of Bengal (Fraser 1933c); Calcutta (Lahiri & Mitra 1976); Manipur (Lahiri 1977b); Meghalaya (Lahiri 1987) : *Northern India* : Uttar Pradesh (Ram *et. al.* 1983) : *Southern India* : Western Ghats (Fraser 1924b). *Central India* : Bastar (Prasad 1996a).

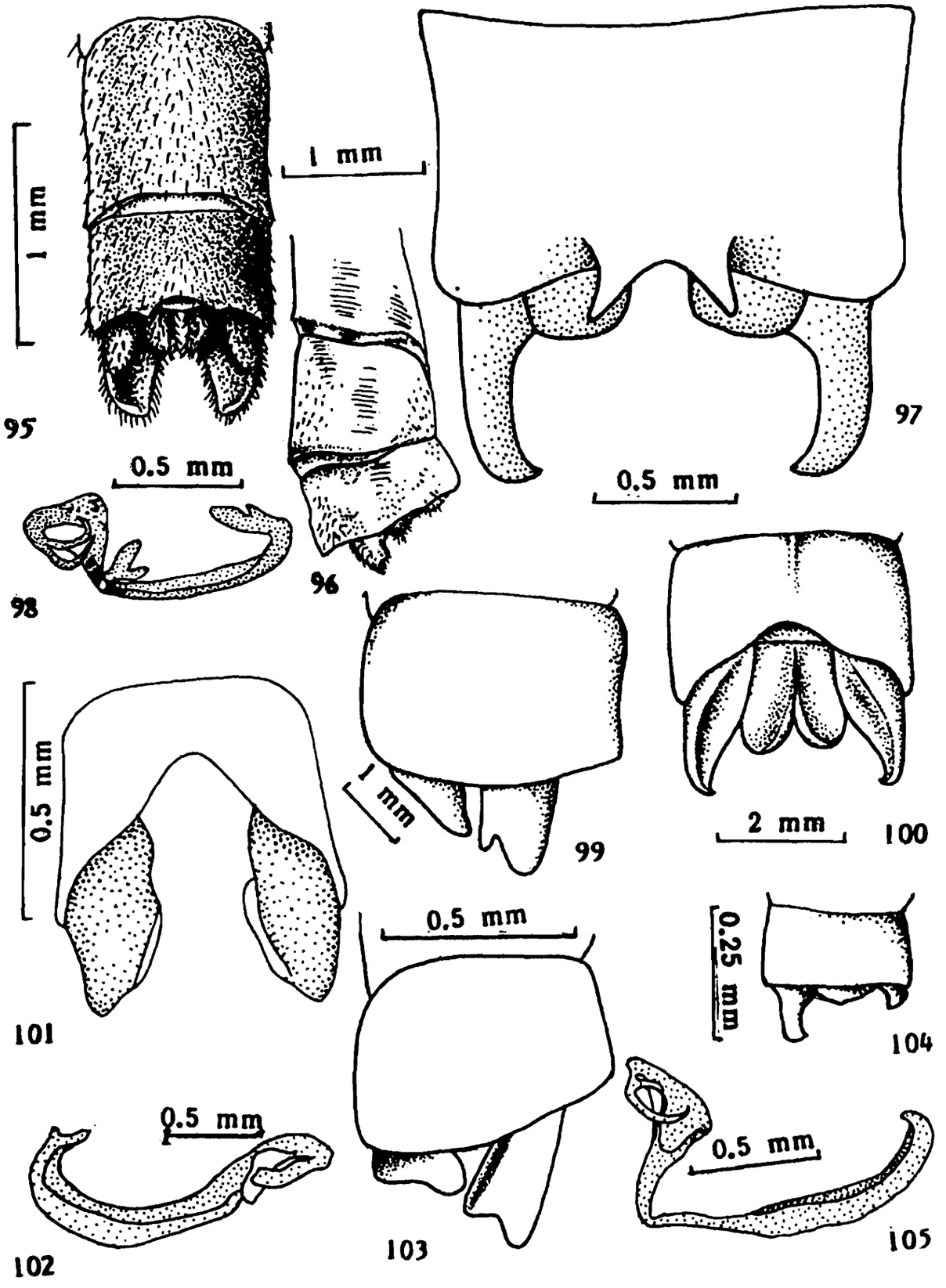


Fig. 95-105. 95. 9th, 10th abdominal segments and anal appendages of male *Rhodischnura nursei* (Morton) (Dorsal view); 96. 9th, 10th abdominal segments and anal appendages of male *Ischnura forcipata* Morton (Right lateral view); 97. 10th abdominal segment and anal appendages of male *Ischnura r. annandalei* Laidlaw (Dorsal view); 98. Penis of *Rhodischnura nursei*; 99. 10th abdominal segment and anal appendages of male *Aciagrion h. hisopa* (Selys) (Left lateral view); 100. 10th abdominal segment and anal appendages of male *Aciagrion occidentale* Laidlaw (Dorsal view); 101. 10th abdominal segment and anal appendages of male *Aciagrion pallidum* Selys; 102. Penis of the same; 103. 10th abdominal segment and anal appendages of *Aciagrion olympicum* Laidlaw (Left lateral view); 104. 10th abdominal segment and anal appendages of male *Ischnura r. rufostigma* Selys (Right lateral view); 105. Penis of the same.

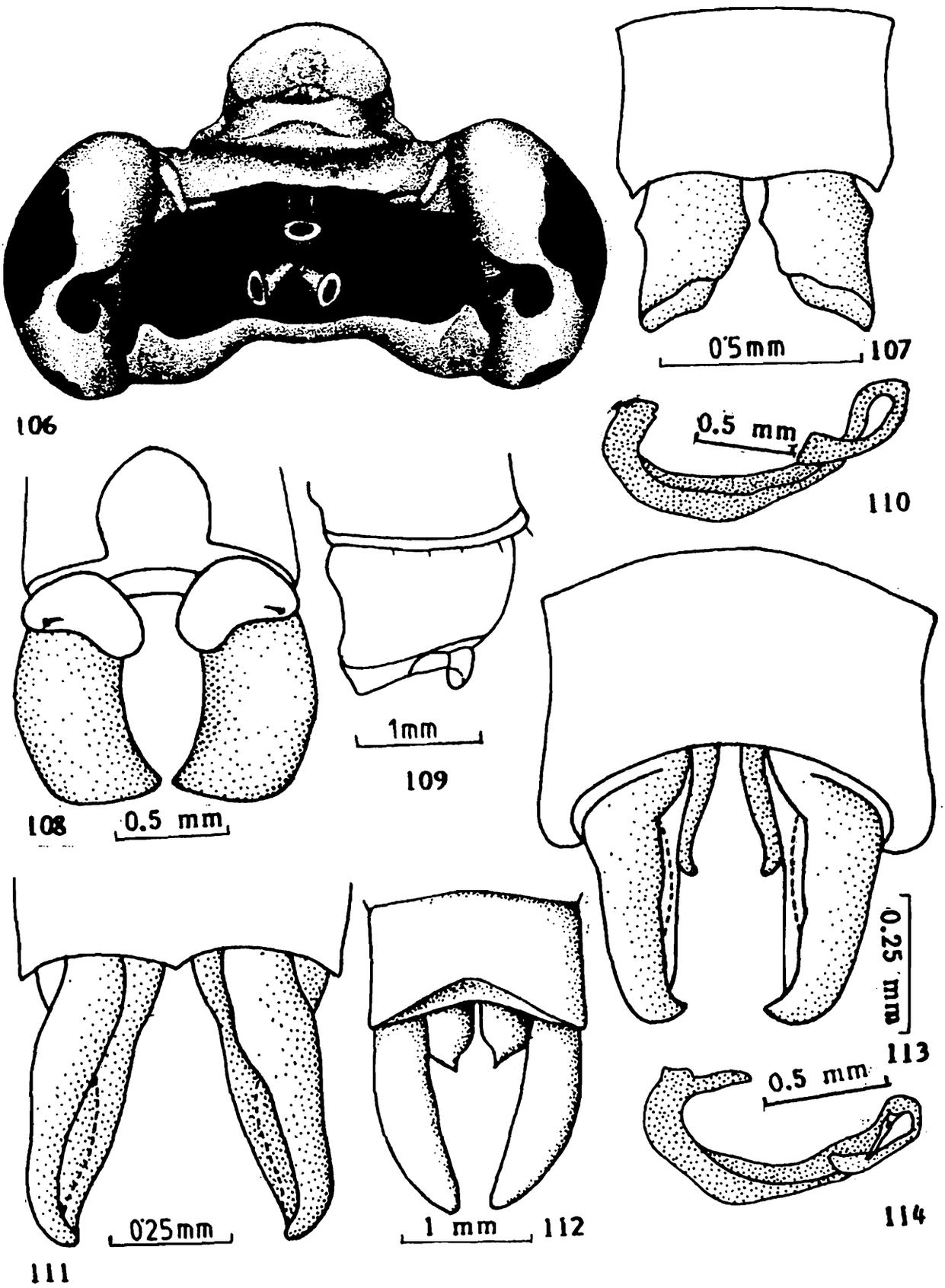


Fig. 106-114. 106. Markings on the head of *Agriocnemis p. pygmaea* (Rambur); 107. 10th abdominal segment and anal appendages of male of the same (Dorsal view); 108. 10th abdominal segment and anal appendages of male of *Enallagma parvum* Selys; 109. 10th abdominal segment and anal appendages of male *Cercion calamorum dyeri* (Fraser) (Right lateral view); 110. Penis of *Agriocnemis p. pygmaea*; 111. 10th abdominal segment and anal appendages of male *Agriocnemis clauseni* Fraser (Dorsal view, 112. 10th abdominal segment and anal appendages of male *Agriocnemis splendidissima* Laidlaw (Dorsal view); 113. 10th abdominal segment and anal appendages of male *Agriocnemis lacteola* Selys (Dorsal view); 114. Penis of the same

Elsewhere : ASIA : Burma, Ceylon (Lieftinck 1971b); Nepal (St. Quentin 1970); Thailand (Tsuda 1991).

Remark : Mitra (1983) reported the following : Kennedy (1920) designated *Enallagma parvum* as the type-species of the genus *Amphiallagma*. But this has been ignored by odonatologists. Untill a better generic diagnosis is given, it is best to continue with its placement in *Enallagma*. Dr. Leonara Gloyd of the university of Michigan, USA, holds the similar opinion.

Genus ***Argiocnemis*** Selys

Argiocnemis Selys, 1877, *Bull. Acad. Belg.* (2) **43** : 135; Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 158; Laidlaw 1919, *Rec. Indian Mus.* 16 : 182; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 405; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 7.

Type-species : *Argiocnemis rubescens* Selys.

Distribution : India, Burma, Malayasia, Indo-China, Sondaic Islands, Borneo, Celebes as far as Australia, West Africa.

Argiocnemis rubescens rubeola Selys

Argiocnemis rubescens Selys, 1877, *Bull. Acad. Belg.* (2) **43** : 136; Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 158; Laidlaw, 1919, *Rec. Indian Mus.* **16** : 182; Fraser, 1923, *J. Bombay nat. Hist. Soc.* **29** : 746; Fraser 1933, *Fauna Brit. India Odon.* **1** : 406-408.

Argiocnemis rubescens rubeola, Tsuda, 1991. *A distributional list World Odonata* 1991 p. 25.

Material examined : Arunachal Pradesh : Namdhapa (211a) 2♂, 2.iv.1981; 2♂, 1♀, 6.iv.1981.

Distribution : *Present Record* : Arunachal Pradesh. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur (Laidlaw 1914); Bengal, Assam (Fraser 1933c); Andaman island (Lahiri & Mitra 1993).

Elsewhere : ASIA : Bangladesh, Burma, Indonesia, Malayasia (Tsuda 1991)

Genus ***Agriocnemis*** Selys

Agriocnemis Selys, 1869, *Pollen & Van Dam, Faune Madagascar, Ins.* p. 24; Selys, 1877, *Bull. Acad. Belg.* (2) **43** : 142; Fraser, 1933, *Fauna Brit. India Odon.* 1 : 379; Lieftinck, 1954, *Treubia* **22** (suppl.) **71** : Lieftnick 1976, *Cah. O.R.S.T.O.M. ser. Hydrobiol.* **10**(3) : 90; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 7.

Type-species : *Agriocnemis rufipes* Kirby

Note on Type Species : Selys (1869) described *Agriocnemis* as a subgenus under *Argiocnemis*. In 1877 he elevated the subgenus into the level of genus *Agriocnemis*. Fraser (1933c) fixed *A. lacteola* Selys as the type-species and it was followed by Pinhey (1974b). However, in 1949 Fraser designated *A. pygmaea* as the type-species and it was followed by Lieftinck (1954). Pinhey (1962) accepted Fraser (1949) but with a comment that if the International Commission upholds Kirby's *A. rufipes* as the type species of the genus *Agriocnemis*, since two distinct genera *Agriocnemis* and *Coenagriocnemis* are involved, hence a new designation may be required for rest of the Kirby-an *Agriocnemis*. The commission, however, accepted *rufipes* as the type-species (Mitra 1983). In the present report *rufipes* has been favoured, pending further revision of *Agriocnemis* and no new name has been proposed for other Kirby-an species as proposed by Pinhey (1962).

Key to Species of Genus *Agriocnemis* Selys

Mitra (1975) provided a key for Indian species of *Agriocnemis* since then further study of eastern Indian forms reveals that *Agriocnemis dabrui* reported by Mitra (1975), Mitra & Lahiri (1980) and Mitra (1983) is nothing but *Agriocnemis nana* Laidlaw, hence the previous key is presented here changing *A. dabreui* to *A. nana*.

Male

1. Inferior anal appendages longer than superiors ..... *femina femina* (Brauer)

– Inferiors anal appendages smaller than superiors 2

2. Abdomen 20.0 mm or long .... *clauseni* Fraser

– Abdomen 18.0 mm or less 3

3. Segment 2 of abdomen with blue eye spots ..... *nana* (Laidlaw)
- Segment 2 of abdomen without blue eyespots 4
4. Labrum metallic blue .... *pygmaea pygmaea* (Rambur)
- Labrum non metallic 5
5. Abdomen white ..... *lacteola* Selys
- Abdomen with heavy black marking .... *splendidissima* Laidlaw

Female

1. Abdomen longer than 20.00 mm .... *clauseni* Fraser
- Abdomen smaller than 20.00 mm 2
2. Middle portion of the prothoracic hindlobe not humped.. *pygmaea pygmaea* (Rambur)
- Middle portion of the prothoracic hindlobe humped 3
3. Middle portion of the hump deeply notched .....*femina femina* (Brauer)
- Middle portion of the hump not or slightly notched 4
4. Hump quadrangular 5
- Roof of hump slightly depressed 6
5. Hind wing 15.0 mm in length .... *nana* (Laidlaw)
- Hind wing 13.0 mm in length .... *lacteola* Selys
6. Dorsal border of prothoracic hind lobe slightly pinkish ..... *pieris* Laidlaw
- Dorsal border of prothoracic hind lobe black ..... *splendidissima*

Agriocnemis lacteola Selys
(Figs. 113, 114)

Agriocnemis lacteola, Selys, 1877, *Bull. Acad. Belg.* (2) 43 : 144. Fraser, 1933, *Fauna Brit. India Odon.* 1 : 381-383; Mitra, 1983, *Ent. Mon. Mag.* 119 : 29.

Material examined : Arunachal Pradesh : Sitapari (269) 1 ♀, 14.iii.1969; 3 ♀, 15.iii.1969; 4 ♀, 16.iii.1969; Assam : Goalpara (145) 1 ♀, 21.xii.1973 : 1 ♀, 23.xii.1973; Orissa : Ganjam (104) 1 ♂, 31.xii.1973. West Bengal : Calcutta (52) 2 ♂, 22.xi.1966.

Distribution : *Present records* : Arunachal Pradesh, Assam, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Bengal (Selys 1877); Dibrugarh N.E. Assam, Dejoo, North Lakhimpur (Laidlaw 1914); Purneah district of Bihar (Laidlaw 1919); Hasimara, Jalpaiguri, Margharita, Nowgong, Dibrugarh, Sikkim (Fraser 1933c); Arunachal Pradesh (Lahiri 1977a); Assam (Lahiri 1979); Meghalaya (Lahiri 1987). *Central India* : Bastar (Prasad 1996a); *Western India* : Goa (Prasad 1995).

Elsewhere : ASIA : China (Klots 1947, Needham 1930); Thailand (Asahina 1982b); Bangladesh, Hongkong, Nepal (Tsuda 1991).

Agriocnemis pieris Laidlaw

Agriocnemis pieris Laidlaw, 1919, *Rec. Indian Mus.* **16** : 179-180; Fraser, 1933, *Fauna Brit. India Odon* **1** : 384-385; Mitra, 1983, *Ent. mon. Mag.* **119** : 29.

Material examined : West Bengal : Calcutta (52) 2 ♀, 23.x.1966; 2 ♀, 27.xi.1966.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : West Bengal, Calcutta (Lahiri & Mitra 1976); Arunachal Pradesh (Ram & Prasad 1999). *Central India* : Madhya Pradesh (Mitra 1955b). *Southern India* : North Kanara (Laidlaw 1919); Coorg Malabar, Wynaad (Fraser 1924b); Nilgiris (Fraser 1931a); Western Ghats, South Kanara (Fraser 1933c) Silent valley (Rao & Lahiri 1983) *Western India* : Bombay (Laidlaw 1914); Goa (Prasad 1995); Maharashtra (Prasad 1996b).

Remark : An addition to the fauna of eastern India (Mitra 1994).

Intraspecific variations : The specimens vary from the description in the Fauna of British India in having labrum yellow apically, black at base; three black spots at the anterior margin of the post clypeus.

Agriocnemis clauseni Fraser
(Fig. 111)

Agriocnemis clauseni Fraser, 1922, *Mem. Deptt. Agric. India (Ent.)* **7**: 53-55; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 390-392.

Material examined: Assam—Meghalaya Road 2♂, 6.iv.1973.

Distribution: *Present record*: Assam. *Past records*: INDIA: *Eastern India*: Assam, Bengal (Fraser 1933c) Meghalaya (Lahiri 1987); Arunachal Pradesh (Prasad 1997b).

Elsewhere: ASIA: Burma (Fraser 1933c; Bhasin 1953); Bangladesh, Nepal, Thailand (Tsuda 1991).

Agriocnemis nana (Laidlaw)

Argiocnemis nana Laidlaw, 1914, *Rec. Indian Mus.* **8**: 348.

Agriocnemis nana, Fraser, 1933, *Fauna Brit. India, Odon.* **1**: 386-387.

Agriocnemis dabreui, Mitra, 1983, *Ent. mon. Mag.* **119**: 29.

Material examined: West Bengal: Calcutta (52) 3♂, 3♀, 13.xi.1970.

Distribution: *Present record*: West Bengal. *Past records*: INDIA: Calcutta (Mitra & Lahiri, 1980).

Elsewhere: ASIA: Burma (Fraser 1933c; Laidlaw 1914; Lieftinck 1948); Malayasia, Singapore, Thailand (Tsuda 1991).

Remark: An addition to the fauna of India.

Intraspecific variation: Notable variations in the medional link of the wing veins have already been mentioned by Mitra & Lahiri (1980).

Female

Abdomen 22-24 mm Hindwing 20-21 mm

Labium yellowish white, labrum pale blue, but broadly black at base; bases of mandibles, genae, ante-and postclypeus black, frons blue, vertex and occiput also black, occiput with ill defined comma shaped post ocular blue spots which are not connected by the isthmus. *Prothorax* broadly black of dorsum; posterior part of the middle lobe yellow; middle portion of the posterior lobe humped, sides are triangular; the apex is yellowish in colour. *Thorax* black on dorsum; antehumeral stripe bluish yellow; but lateral sides blue; a small black spot on postero-lateral suture legs white on the flexor surface of tibiae; extensor surface of femora black, *Wings* hyaline; pterostigma yellow, covering less than one cell; 7 spot nodals in the forewings and 5 in the hind wings. *Abdomen* azure blue; black marking are as follows; segment 1 with a quadrate dorsal spot; segments 2-4 with imperfect cobra hood marking; 5-10 black dorsally; anal appendages yellow, ovipositor yellow.

Juvenile males are reddish yellow in colour and lack black marks.

Agriocnemis splendidissima Laidlaw
(Fig. 112)

Agriocnemis splendidissima Laidlaw, 1919, *Rec. Indian Mus.* **16**: 181-182; Fraser, 1933, *Fauna Brit. India Odon.* **1**: 392-394.

Material examined: Assam: Barpeta (3) 1♂, 4.iv.1986; Goalpara (235) 1♂, 1♀, 13.vi.1973; 1♀, 15.vi.1973; Orissa: Ganjam (104) 1♀, 14.iii.1974; Tripura: Teliamura (101) 1♀, 12.ix.1974.

Distribution: *Present records*: Assam, Orissa and Tripura. *Past records*: INDIA: *Eastern India*: Bihar (Prasad & Varshney 1988), Hooghly, Howrah (Ram *et. al.* 1982). *Central India*: Sagar (Srivastava & Suri Babu 1997). *Southern India*: Kanara, Talewadi, Chalakudi, Cochin (Laidlaw 1919); Coorg, Malabar (Fraser 1931a) Nilgiri, Wynaad (Fraser 1933c); Silent valley (Rao & Lahiri 1983); *Western India*: Mhow, Poona, Khandala (Fraser 1933c).

Remark: New record from Assam, Orissa and Tripura (Mitra 1994).

Intraspecific variation: Only the female specimens from Assam differ from the description present in the Fauna of British

India due to possession of ochreous labrum and brown occiput.

Agriocnemis pygmaea pygmaea (Rambur) (Figs. 106, 107, 110, 191)

Agrion pygmaeum Rambur, 1842, *Ins. Nevrop.* p. 278.

Agriocnemis pygmaea Selys, 1877, *Syn. Agr. 5me Legion : Agrion (Suite et fin)* p. 52; Fraser, 1933. *Fauna Brit. India Odon.* : 398-401; Lieftinck, 1954, *Treubia*, 22 (suppl.) 73.

Agriocnemis pygmaea pygmaea Mitra, 1983, *Ent. Mon. Mag.* **119** : 30.

Material examined : Arunachal Pradesh : Bhaluk Pong (32) 1♂, 1♀, 23.iii.1969; Namsai (212a); 1♀, 15.ii.1969; Sessa (259) 1♂, 21.iii.1973; Sunpura (276a) 1♀, 3.iii.1969; Assam : Damadali (79) 1♀, 15.ix.1975; Goalpara (235) 2♀, 13.vi.1973; (118) 1♀, 20.vi.1973; (145) 1♂, 23.xii.1973; Bihar : Hazaribagh (126) 6♂, 29.x.1974; 2♂, 30.x.1974; 3♂, 2♀, 31.x.1974; Palamau (191) 1♂, 12.xi.1974; Manipur : Imphal 1♀, 12.xi.1983; Mizoram : Phaileng 3♂, 2♀, 23.xi.1991; Nagaland : Mokokchung 3♂, 18.ix.1994; Orissa : Bolangir (38b) 1♂, 7.xi1972; Balasore (14) 2♂, 7.xii.1966; Puri (233) 1♀, 30.xii.1973; 1♂, 10.i.1974; Sikkim : (234) Rabangla 1♀, 2.x.1988; 1♀, 3.x.1988; 1♂, 1♀, 7.x.1988; (246) Ranipool 1♂, 12.x.1988; (287a) Tumin 1♀, 29.ix.1988; West Bengal : Bankura (65) 1♂, 31.vii.1974; Birbhum (237) 2♀, 8.x.1974; (260) 2♀, 9.x.1974; (255) 1♂, 10.ix.1974; Calcutta (52) 1♀, 2.x.1966; 4♀, 5.x.1966; 1♂, 19.x.1966; 1♂, 23.x.1966; 1♂, 2.x.1966; 5♂, 2.xi.1966; 1♂, 4.xii.1966; 2♂, 11.xii.1966; 2♂, 1.i.1967; 1♀, 29.i.1967; 2♂, 12.ii.1967; 3♂, 2♀, 5.iii.1967; 1♂, 12.iii.1967; 1♂, 1.iv.1967; 2♂, 23.iv.1967; 1♂, 13.v.1967; 1♂, 14.v.1967; 2♂, 23.vii.1967; 1♂, 20.viii.1967; Howrah (120a) 1♀, 6.x.1974; 24 Parganas : (124) 1♂, 20.viii.1973; (24a) 1♀, 7.ix.1974; (209) 9♂, 6♀, 12.x.1974; (119a) 1♂, 1♀, 11.ix.1983; (195a) 4♂, 13.ix.1983; (32a) 3♂, 1♀, 17.ix.1983; (10a) 2♂, 3♀, 18.ix.1983; Jalpaiguri (49) 1♂, 1♀, 20.xii.1984.

Distribution : *Present records* : Arunachal Pradesh; Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Selys 1891); North Lakhimpur (Laidlaw 1914); Barkuda Island (Fraser & Dover 1922); Manipur (Lahiri 1977b); Assam, Arunachal Pradesh, Mizoram (Lahiri 1979) Meghalaya (Lahiri 1987); *Northern India* : Uttar Pradesh (Ram *et. al.* 1982); Dehra Dun, Lachiwala (Bhasin 1953); Rajasthan (Bose & Mitra 1976). *Southern India* : Bollovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Travancore (Fraser 1931a). Tamil Nadu (Kumar 1990). Nicobar Island (Hagen 1858; Selys 1891). *Central India* : Sagar (Srivastava & Suri Babu 1997). *Western India* : Goa (Prasad 1995); Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Bhamo, Palon, Teinzo (Selys 1891); China (Klots 1947, Needham 1930, Rowe 1981); Formosa (Needham 1930); Singapore (Brauer 1864); Thailand (Kiauta & Kiauta 1983b); Ceylon (Kirby 1893, Selys 1891); Java, Rainbode (Hagen 1858); Philippines (Kirby 1893); Afghanistan, Bangladesh, Indonesia, Japan, Kampuchea, Malayasia, Nepal, Pakistan, Taiwan (Tsuda 1991). AFRICA (Pinhey 1974b) Seychelles Is. (Blackman & Pinhey 1967). AUSTRALIA (Tsuda 1991); Sydney, N.S. Wales (Ris 1912); Papua New Guinea (Tsuda 1991).

Intraspecific variation : One male example from Rajasthan differs from specimens of eastern India owing to lack of apple green color on prothorax of the former; however the male specimens (6♂) from Nicobar, Maharashtra (1♂); Madhya Pradesh (2♂) agree with the specimens from the eastern India, one female specimen from Rajasthan and female examples of 24 Parganas lack the connecting link of the post ocular spots.

Agriocnemis femina femina (Brauer) (Fig. 117)

Agrion (Ischnura) femina Brauer, 1868, *Verh. zool. bot. Wien* **18** : 554.

Agriocnemis incisa Selys, 1877, *Bull. Acad. Belg.* (2) **43** : 143; 149.

Agriocnemis femina Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 158; Fraser, 1933, *Fauna Brit. India Odon* 1 : 402-404; Lieftinck, 1954, *Treubia* 22 (suppl.) : 72.

Agriocnemis femina femina Mitra, 1975, *J. Zool. Soc. India, B.S. Chauhan Com. Vol.* p. 406.

Material examined : Assam : Goalpara (145) 1 ♀, 21.xii.1973; 4 ♂, 2 ♀, 23.xii.1973; Manipur : Mairang (202) 2 ♂, 3 ♀, 16-19.iii.1974.

Distribution : *Present records* : Assam and Manipur. *Past record* : INDIA : *Eastern India* : Dibrugarh, N.E. Assam (Laidlaw 1914); Sibsagar (Bhasin 1953); Assam, Bengal (Fraser 1933c); Manipur (Lahiri 1977b); *Western India* : Maharashtra (Prasad 1996b). Great Nicobar (Mitra 1995a).

Elsewhere : ASIA : Burma (Fraser 1933c; Bhasin 1953); China Klots (1947, Needham 1930); Formosa (Needham 1930); Borneo, Celebes, Java, Fraser (1933c), Micronesia (Lieftinck 1962); New Guinea (Ris 1930); Philippines (Kiauta & Kiauta 1983a); Thailand (Kiauta & Kiauta 1983b); Singapore, Vietnam, Bangladesh; Australia (Tsuda 1991); Cuba (Mitra 1995a).

N.B. : A.f. oryzae reported by Chhotani *et. al* (1983) was wrongly determined.

Genus *Mortonagrion* Fraser

Mortonagrion Fraser, 1920, *J. Bombay nat. Hist. Soc.* 27 : 148; Fraser, 1933, *Fauna Brit. India Odon.* 1 : 408.

Type-species : *Mortonagrion varralli* Fraser.

Distribution : India, Burma, China, Japan, Korea, Indonesia, Malayasia, Thailand, Ceylon, Russia, Papua New Guinea, Congo, Zaire.

Mortonagrion aborense (Laidlaw) (Figs. 115, 116)

Argiocnemis aborensis Laidlaw, 1914, *Rec. Indian Mus.* **8** : 347; Fraser, 1933, *Fauna Brit. India Odon.* **1** : 394-395.

Mortonagrion aborense, Tsuda, 1991, *A distributional list of World Odonata, 1991*, p. 39.

Mortonagrion gautama Fraser, 1933, *Fauna Brit. India, Odon.* **1** : 411.

Material examined : Mizoram : Terei (281b) 1 ♂, 25.x.1991.

Distribution : *Present record* : Mizoram. *Past records* : INDIA : *Eastern India* : Abor Hills (Laidlaw 1914), Duars of North Bengal (Fraser 1933c).

Elsewhere : ASIA : Indonesia, Thailand (Tsuda 1991).

Remark : New record from Mizoram.

Genus *Onychargia* Selys

Onychargia Selys, 1865, *Bull. Acad. Belg.* (2) **20** : 416; Fraser 1933, *Fauna Brit. India Odon.* **1** : 416 : Lieftinck, 1954, *Treubia* **22** (suppl.) : 53; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 8.

Type-species : *Onychargia atrocyana* Selys

Distribution : India, Bangladesh, Burma, Indonesia, Sri Lanka, Malayasia, Singapore, Thailand, Vietnam.

Key to Species of Genus *Onychargia* Selys

Abdomen 23-24 mm, Hindwing 18-19 mm. .....*atrocyana* Selys

Abdomen 28, Hindwing 21 mm.... sp. indet

Onychargia atrocyana Selys (Fig. 11)

Onychargia atrocyana Selys, 1865. *Bull. Acad. Belg.*, (2) **20** : 416; Fraser, 1933. *Fauna Brit. India Odon.*, **1** : 417-418; Lieftinck, 1954. *Treubia*, **22** (suppl.) : 53.

Material examined : Arunachal Pradesh : Namsai (212a) 1 ♂, 15.iii.1969; Assam : Goalpara 1 ♂, 2.vi.1973; Manipur : Mairang (202) 1 ♀, 25.v.1974; Nagaland : Dimapur 2 ♀, 17.ix.1994; Orissa : Bolangir (38b) 1 ♂, 9.xi.1972 : West Bengal : Calcutta (52) 1 ♀, 28.ix.1966; 1 ♂, 24.iii.1967; 1 ♂, 2.iv.1967; 1 ♂, 19.iv.1967.

Distribution : *Present records* : Arunachal Pradesh; Assam; Manipur, Nagaland, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur Upper

Assam (Laidlaw 1914); Sibsagar, Assam (Laidlaw 1919); Bengal (Fraser 1933c); Arunacal Pradesh (Prasad 1997b). *Central India* :Bastar (Prasad 1996a). *Southern India* : Coorg (Fraser 1924b; 1931a); Malabar (Fraser 1933c).

Elsewhere : ASIA : Myanmar (Burma) (Fraser 1933c; Lieftinck 1971b); Malayasia (Brooks 1981); Borneo (Lieftinck 1971b); Ceylon (Fraser 1924; Lieftinck 1971b); Thailand (Kiauta & Kiauta 1983b); Bangladesh, Hongkong, Indonesia, Nepal, Singapore, Vietnam (Tsuda 1991).

Remark: A new record from Manipur. (Mitra 1994).

Intraspecific variations: The male specimens vary from Fraser's (1933c) description being attributed with yellowish black labrum, deep blue abdomen.

Onychargia sp. indet.
(Fig. 118)

Material examined : Mizoram : Terei (281b) 3♀, 22.x.1991; 1♀, 24.x.1991.

Female

Abdomen 27-28 mm Hindwing 21-23 mm

Head : Labium, labrum bases of mandibles yellow; labrum with a brown spot in the middle; clypeus brownish yellow; vertex black, a yellow line connecting two antennae. Eyes blue; two elongated post ocular spots. *Prothorax* black on dorsum, yellow laterally. *Thorax* black on dorsum; yellow antehumeral stripe, followed by a thick band of black line; lateral side yellow, except a black line on the posterolateral suture; under surface yellow. *Legs* yellow, extensor surface of femora black, spines black; tibiae yellowish black. *Wings* hyaline, postnodals in forewing 15-18 and in hindwing 14-17; pterostigma brown, covering about $1\frac{1}{2}$ cells. *Abdomen* black; first segment yellow; lateral side of segments 2-4 yellow, dorsum of all black and ventral brown. A black dot on the lateral side of the junction of thorax and abdomen. Anal appendages black vulvar scale black, base and apex faint brown. The scale extends upto the end of abdomen.

Remark : The specimens are distinguishable from *Onychargia atrocyana* Selys with the aid of their size and colour of different body parts.

Suborder ANISOPTERA

Key to Superfamilies of Suborder ANISOPTERA*

1. Discoidal cell in fore-and hind wings more or less identical in shape ..... *Aeshnoidea*
– Discoidal cell in fore-and hind wings differ in shape 2
2. Eyes broadly confluent ..... *Libelluloidea*
– Eyes either closely apposed or slightly separated ..... *Cordulegasteroidea*

Superfamily AESHNOIDEA

Distribution : Cosmopolitan

Key to Families of Superfamily AESHNOIDEA

Eyes separated ..... Gomphidae

Eyes united ..... Aeshnidae

Family GOMPHIDAE

Distribution : Cosmopolitan

Key to Genera of Family GOMPHIDAE

1. Discoidal cell, hypertrigone and subtriogone of forewing traversed 3

* Tillyard & Fraser (1938-1940), Fraser (1957) and Davies (1981) cleaved the suborder Anisoptera into three superfamilies. Fraser (1957) reported eight families under the suborder. Gloyd (1959) elevated *Macromia* group into a new family, Macromiidae which was also supported by Davies (1981) despite Lieftinck's (1971a; 1977a) doubt about the actual relationship of the *Macromia*-group and other corduliids. Davies & Tobin (1985), Tsuda (1986, 1991, 2000) did not accept Gloyd's *(op. cit.)* view.

- Discoidal cell, hypertrigone and subtrigone of forewing entire 2

2. Sectors of arc enclose 4 transverse nervures in the region between the point of their origin and bifurcation of R_s ..... *Macrogomphus* Selys

- Sectors of arc enclose 2 transverse nervures in the region between the point of their origin and the bifurcation of R_s 4

3. Segment 8 of abdomen dilated; sectors of arc enclose 10-12 nervures in the region between the point of their origin and the bifurcation of R_s ..... *Ictinogomphus* Cowley

- Segment 8 of abdomen not dilated; sectors of arc enclose 7-8 transverse nervures in the region between the point of their origin and the biburcation of R_s ..... *Gomphidia Selys*

4. Cu_2 and IA not divergent at the border of the hindwing ..... *Stylogomphus* Fraser

- Cu_2 and IA not divergent at the border of the hindwing 5

5. Wings narrow at base; basal abdominal segments quite slender ..... *Phaenandrogomphus* Lieftinck

- Wings narrow at base, basal abdominal segments not slender 6

6. Hypertrigone in the hindwing shorter than the space lying between the node and the origin of IR_3 7

- Hypertrigone in the hindwing as long as or longer than the space lying between the node and the origin of IR_3 ..... *Paragomphus* Cowley

7. Male inferior anal appendages subequal to the superiors and its branches are parallel or weakly divergent; usually beset with tooth ..... *Onychogomphus* Selys

- Male inferior anal appendages half the length of the superior and its branches are divergent and not provided with tooth ..... *Nihonogomphus* Oguma

Genus ***Nihonogomphus*** Oguma

Nihonogomphus Oguma, 1926, *Ins. Matsumura* **1** : 97; Lieftinck, 1964, *Zool. Medded* **39** : 102; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 32.

Onychogomphus Fraser, 1934, *Fauna Brit. India Odon.* **2** : 239.

Type-species : *Nihonogomphus viridis* Oguma

Distribution : India, Burma, Japan.

Nihonogomphus pulcherrimus (Fraser) (Fig. 122)

Onychogomphus pulcherrimus Fraser, 1927, *Rec. Indian Mus.* **29** : 78-79; 1934, *Fauna Brit. India Odon.* **2** : 267-268.

Nihongomphus pulcherrima, Davies & Tobin, 1985, *Dragonflies of the World* **2** : 42.

Material examined : Bihar : Palamau (222) 1♀, 18.vi.1983; 1♂, 20.vi.1983.

Distribution : *Present record* : Bihar. *Past record* : INDIA : Nil.

Elsewhere : ASIA : Burma, Mamyo (Fraser 1927c; 1934b; Kimmins 1966).

Remark : A new record from India (Mitra 1994).

Intraspecific variations : The male varies from Fraser's (1934b) description owing to the possession of straw yellow labium with pale brown anterior border; labrum, face and frons light olive. In addition to the above the ridge of frons brown. Nodal index $\frac{7\text{-}14}{8\text{-}11}$ / $\frac{13\text{-}9}{11\text{-}9}$

Female : The specimen does not vary much from the male. Its first abdominal segment is broadly yellow on lateral sides. Nodal index $\frac{8\text{-}13}{9\text{-}9}$/ $\frac{14\text{-}8}{10\text{-}8}$

Genus ***Onychogomphus*** Selys

Onychogomphus Selys, 1854, *Bull. Acad. Belg.* **21** : 30; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 239; Lieftinck 1954, *Treubia* **22** (suppl.) : 91; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 32., Pinhey 1985 *J. Ent. Soc. Sth Afr.* 48 : 7.

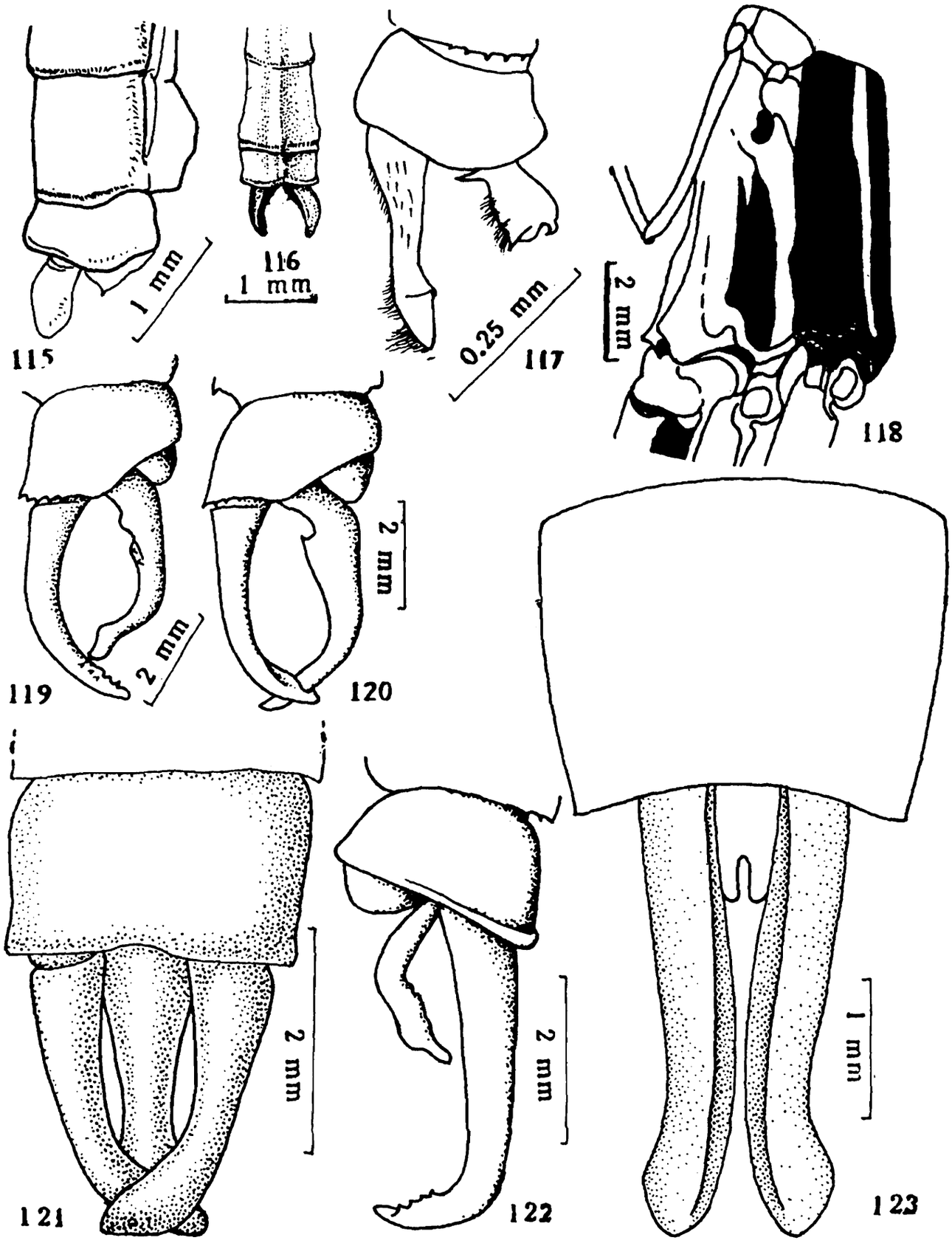


Fig. 115-123. 115. 9th, 10th abdominal segments and anal appendages of *Mortonagrion aborense* (Laidlaw) (Right lateral view); 116. Same (Dorsal view); 117. 10th abdominal segment and anal appendages of *Agriocnemis f. femina* (Brauer) (Right lateral view); 118. Markings on thorax of *Onychargia* sp. (Left lateral view); 119. Anal appendages of *Phaenandrogomphus aureus* (Laidlaw); 120. Anal appendages of male *Onychogomphus striatus* Fraser (Right lateral view); 121. Anal appendages of male *Onychogomphus biforceps* Selys (Right lateral view); 122. Anal appendages of male *Nihonogomphus pulcherrimus* (Fraser) (Left lateral view); 123. Anal appendages of male *Paragomphus lineatus* (Selys) (Dorsal view)

Lamelligomphus Fraser, 1934, *Fauna Brit. India Odon.* **2**: 269*

Nepogomphus Fraser, 1934, *Fauna Brit. India Odon.* **2**: 282**

Type-species: *Libellula forcipata* Linnaeus

Distribution: India, Nepal, China, Nicobar, Burma, Vietnam, Malayasia, Indonesia, Taiwan, Turkey, Iraq, Iran, Europe, Africa, Madagascar.

Key to Species of Genus *Onychogomphus* Selys

Base of hindwing oblique, pterostigma swollen in the middle ..... *striatus* Fraser

Base of hindwing not oblique, pterostigma not swollen in the middle ..... *biforceps* Selys

Onychogomphus striatus Fraser
(Fig. 120)

Onychogomphus bistrigatus Fraser, 1922, *Rec. Indian Mus.* **24**: 424.

Onychogomphus striatus Fraser, 1924, *Rec. Indian Mus.* **26**: 428; 478; 1934, *Fauna Brit. India Odon.* **2**: 249-250.

Material examined: West Bengal: Darjeeling (18) 1♂, 23.viii.1975.

Distribution: *Present record*: West Bengal. *Past records*: INDIA: *Southern India*: Nilgiris (Fraser 1924b; 1931a; 1934b).

Elsewhere: Nepal (Tsuda 1991).

Remark: A new record from North India.

Onychogomphus biforceps Selys
(Figs. 12, 121)

Onychogomphus biforceps Selys, 1878, *Bull. Acad. Belg.* (2) **46**: 420.

Lamelligomphus biforceps biforceps Fraser, 1923, *J. Bombay nat. Hist. Soc.* **29**: 64.

Lamelligomphus biforceps Laidlaw, 1930, *Trans. Ent. Soc. Lond.* p. 193; Fraser, 1934, *Fauna Brit. India Odon.* **2**: 271-272.

Material examined: Arunachal Pradesh: Siang (228) 1♂, 15.x.1966.

Distribution: *Present record*: Arunachal Pradesh. *Past records*: INDIA: *Eastern India*: Pashoke, Darjeeling (Laidlaw 1922); *Northern India*: Garhwal hills (Prasad 1974); Dehra Dun (Kumar & Mitra 1998).

Elsewhere: ASIA: Burma, Tonkin (Fraser 1924c; 1934b; Williamson 1907); Nepal (St. Quentin 1970); Vietnam (Tsuda 1991).

Remark: An addition to the fauna of Arunachal Pradesh. (Mitra 1994).

Genus ***Phaenandrogomphus*** Lieftinck

Phaenandrogomphus Lieftinck, 1964, *Zool. Verh.* 69: 4; Davies, 1981. *Synop Ext. Gen. Odon.* p. 30.

Type-species: *Phaenandrogomphus aesthenes* Lieftinck

Distribution: South Asia

Phaenandrogomphus aureus (Laidlaw)
(Fig. 119)

Onychogomphus aureus Laidlaw, 1922, *Rec. Indian Mus.* **26**: 405-406.

Material examined: Arunachal Pradesh: Siang (76) 1♂, 12.x.1966; Subansiri (285) 1♀, 13.v.1966; (28) 1♂, 27.x.1966.

Distribution: *Present record*: Arunachal Pradesh. *Past records*: INDIA: *Eastern India*: Tura, Garo Hills (Fraser 1934b; Laidlaw 1922).

Remark: New record for Arunachal Pradesh. (Mitra 1994).

Genus ***Stylogomphus*** Fraser

Stylogomphus Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7**: 69. 1934, *Fauna Brit. India Odon.* 2: 288; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 33, Carle & Cook, 1984, *Odonatologica* **13**: 66, 68.

Type-species: *Stylogomphus inglisi* Fraser

Distribution: India, Japan, Ryuku, China, North America.

* According to Lieftinck (1954), Davies (1981) and Davies & Tobin (1985) the description of *Lamelligomphus* provided by Fraser (1934b) closely agrees with *Onychogomphus*. ** Lieftinck (1954) and Davies (1981) considered *Nepogomphus* as the synonym of *Onychogomphus*; Chao (1984), however, reported that these are closely related, although he kept them separate. In the present investigation Lieftinck (1954) and Davies (1981) has been followed.

Stylogomphus inglisi Fraser

Stylogomphus inglisi Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7**: 70-71; 1934, *Fauna Brit. India Odon.* **2**: 290-291.

Material examined: West Bengal: Darjeeling (266) 1♀, 18.iv.1973.

Distribution: *Present record*: West Bengal. *Past record*: INDIA: *Eastern India*: Teesta river, Darjeeling district (Fraser 1922, 1925a, 1934b; Kimmins 1966); Meghalaya (Lahiri 1987).

Elsewhere: ASIA: Bangladesh, Nepal (Tsuda, 1991).

Intraspecific variations: The specimen varies from Fraser's (1934b) description in having the nodal index $\frac{9\text{-}11}{9\text{-}9}/\frac{11\text{-}9}{9\text{-}8}$

Genus ***Paragomphus*** Cowley

Mesogomphus Förster, 1966, *Jahrb. Nassau ver. Naturk. Wiesb.* 59: 323; Fraser, 1934, *Fauna Brit. India Odon.* 2: 228. *Paragomphus* Cowley, 1934, *Entomologist* 67: 201; Lieftinck, 1954, *Treubia* 22 (suppl.): 94; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 32.

Type-species: *Gomphus cognatus* Rambur*

Distribution: India, Nepal, Sri Lanka, Burma, Malayasia, Indonesia, Africa, Madagascar.

Paragomphus lineatus (Selys) (Figs. 123, 192)

Gomphus lineatus Selys, 1850, *Rev. Odon.* p. 386.

Onychogomphus lineatus Selys, 1854, *Bull. Acad. Belg.* **21**: 36.

Mesogomphus lineatus Fraser, 1924, *Rec. Indian Mus.* 26: 427, 477 1934, *Fauna Brit. India Odon.* **2**: 230-234.

Material examined: Bihar: Hazaribagh (126) 1♀, 2.xi.1974, Palamau (191) 1♀, 12.xi.1974. Orissa: Dhenkanal (88) 1♂, 29.xi.1973; Koraput (168) 2♂, 29.xi.1973; Phulbani (230) 1♂, 15.xii.1973; Sikkim: Khanikhola (159b) 1♂, 1♀, 6.vii.1979; Tripura: Udaipur (106) 1♂, 4.xi.1974; West Bengal: Bankura (21) 1♂, 3.viii.1974; Darjeeling (266) 1♂, 18.iv.1973; (203) 1♂, 12.iii.1974; (128) 1♂, 15.iii.1974.

Distribution: *Present records*: Bihar, Orissa, Sikkim, Tripura and West Bengal. *Past records*: INDIA: *Eastern India*: Bengal (Fraser 1934b); Bihar (Fraser 1924c), Chota Nagpur (Laidlaw 1922); Sikkim (Prasad & Ghosh 1984b) Mghalaya (Lahiri 1987); Arunachal Pradesh (Prasad 1997). *Northern India*: Dehara Dun (Bhasin 1953; Fraser 1924c; 1934b). *Central India*: Bastar (Prasad 1996a). *Western India*: Poona (Fraser 1919a; 1924c; 1934b; Laidlaw 1922); Maharashtra (Prasad 1996b). *Southern India*: Bolovumpattis, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Bangalore, Khandala, Madras, Trichinapolly (Fraser 1934b); Andhra Pradesh (Joseph & Satyarani 1988).

Elsewhere: ASIA: Burma (Bhasin 1953), Ceylon (Laidlaw 1922); Nepal (Kiauta 1974, Williamson 1907). S.E. Turkey (Schneider 1985a).

Remark: New record from Orissa and Tripura (Mitra 1994).

Intraspecific variation: Specimens from Bankura (West Bengal) and Orissa agree with each other but differ from specimens from Sikkim, Tripura, Darjeeling as well as from Fraser's (1934b) description in having thorax dark brown, legs brown with extensor surface of femora yellow, labium bluish yellow but the anterior border brown, labrum bluish white, clypeus, frons olivaceous yellow, with brown crest, pterostigma covering $3\frac{1}{2}$ cells; nodal index $\frac{7\text{-}12}{8\text{-}9}/\frac{13\text{-}9}{10\text{-}6}; \frac{5\text{-}12}{7\text{-}9}/\frac{12\text{-}6}{9\text{-}7}$; anal appendages reddish yellow dark brown at the tip.

Genus ***Macrogomphus*** Selys

Heterogomphus Selys (Pars), 1854, *Bull. Acad. Belg.* **21(2)**: 27.

* Fraser (1934b) cited *Gomphus cognatus* as the type species of *Mesogomphus;* while Lieftinck (1954) considered *Mesogomphus ngulicus* Förster as the type species of *Mesogomphus.* Lieftinck *(op. cit.),* Davies (1981) cited *Gomphus cognatus* as the type-species of *Paragomphus* and Gloyd (1983) put reason to consider *Gomphus cognatus* as the type-species.

Macrogomphus Selys, 1857, Mon. Gomph. p. 87, 428; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 339; Lieftinck, 1954, *Treubia* 22 (suppl.) : 85; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 30.

Distribution : India, Burma, Java, Sumatra, Srilanka, Indo-China, Borneo, Tibet, Malayasia.

Macrogomphus montanus Selys (Fig. 124)

Macrogomphus montanus Selys, 1869, *Bull. Acad. Belg.* (2) **28** : 171, Fraser, 1935, *Fauna Brit. India Odon.* **2** : 345-346.

Material examined : West Bengal : Barrackpore (24) 1♂, 23.vii.1975.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Laidlaw 1922); Barrackpore (Ram *et. al.* 1982).

Elsewhere : ASIA : Bangladesh, Sylhet (Fraser 1926; 1934b), China (Needham 1930), Burma, Nepal (Tsuda 1991).

Intraspecific variation : The specimen varies from Fraser's (1934b) description due to its pale bluish yellow labium, reddish brown occiput. The specimen varies from one male specimen from Uttar Pradesh since the thorax of the latter bears bluish-yellow marking.

Genus *Ictinogomphus* Cowley

Ictinus Rambur, 1842, *Ins. Nevrop.* p. 171; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 370.

Indictinogomphus Fraser, 1939, *Proc. R. Ent. Soc. Lond.* (B) **8** : 21.

Ictinogomphus Cowley, 1934, *Entomologist* **67** : 274; Lieftinck; 1954, *Treubia* **22** (suppl.) : 77; Davies, 1981, *Synop. Ext. Ges. Odon.* p. 34.

Type-species : *Ictinus ferox* Rambur

Distribution : Africa, India, Burma, Sri Lanka, Java, Sumatra, China, Phillippines, Australia.

Key to Species of Genus *Ictinogomphus* Cowley

Segment 8 with a basal yellow ring .... *rapax* (Rambur)

Segment 8 without a basal yellow ring .... *pertinax* (Selys)

Ictinogomphus rapax (Rambur)

Diastatoma rapax Rambur, 1842, *Ins. Névrop.* p. 169.

Ictinus rapax Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 90; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 373-376.

Ictinogomphus rapax, Mitra, 1983, *Ent. Mon. Mag.* **119** : 30.

Material examined : Arunachal Pradesh : Siang (176) 1♂, 14.x.1981; Assam : Goalpara (235) 1♂, 1♀, 12.vi.1973; Orissa : Barsham (27) 1♀, 13.ix.1972, Sundergarh (275) 1♀, 26.x.1972; West Bengal; Bankura (21) 1♀, 1.viii.1974; Calcutta (52) 1♂, 7.vii.1967; Cochbehar (166) 1♂, 1.ix.1983.

Distribution : *Present records* : Arunachal Pradesh, Assam, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Barkuda Island (Fraser & Dover 1922); Bhubaneswar (Dasgupta 1957); Calcutta (Dasgupta 1957; Laidlaw 1922; Mitra 1983); Cachar (Bhasin 1953); Chota Nagpur (Laidlaw 1922); Haflong (Bhasin 1953); Howrah (Dasgupta 1957); Mursidabad (Laidlaw 1922). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Rajasthan (Bose & Mitra 1976; Tyagi & Miller 1991); *Central India* : Gwalior, Saugor (Baijal & Agarwal 1955); Bastar (Prasad 1996a). *Western India* : Bombay, Poona (Fraser 1924b); Maharashtra (Prasad 1996b). *Southern India* : Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Tamil Nadu (Kumar 1990); Andaman Islands (Fraser 1923c); Andhra Pradesh (Joseph & Satyarani 1988).

Elsewhere : ASIA : Bangladesh : Chittagonj (Chowdhury & Akhteruzzaman 1981); Burma; (Fraser 1923c; Lieftinck 1971b); China (Needham 1930); Nepal (St. Quentin 1970).

Intraspecific variation : 1♂, specimen from Rajasthan varies from the specimen under study since the former possesses bluish yellow labrum with deep brown base; deep brown on the upper surface of frons; distinctly bifid occipital spine; yellow on the lateral sides of prothorax.

Ictinogomphus pertinax (Selys)

Ictinus pertinax Selys, 1854, *Bull. Acad. Belg.* 21(2) : 80; Fraser, 1934, *Fauna Brit. India Odon.* 2 : 377-378.

Ictinogomphus pertinax Ram *et. al.* 1982, *Rec. zool. Surv. India* 80 : 179.

Material examined : Arunachal Pradesh : Siang (176) 1♂, 14.x.1981; Bihar : Palamau (222) 1♂, 20.vi.1983; West Bengal : Howrah (120a) 1♂, 10.viii.1975.

Distribution : *Present records* : Arunachal Pradesh, Bihar and West Bengal. *Past records* : INDIA : *Eastern India* : Howrah (Ram *et. al.* 1982).

Elsewhere : ASIA : Burma (Fraser 1934b, Williamson 1907); China (Fraser 1934b; Rowe 1981); Taiwan (Lieftinck *et. al.* 1984); Japan, Nepal (Tsuda 1991).

Remark : New record from Arunachal Pradesh and Bihar. Although Fraser (1934b) reported its occurrence in Malayasia but Lieftinck (1954) did not confirm.

Intraspecific variation : The specimen from Bihar varies from that of Arunachal Pradesh and West Bengal as well as from Fraser's (1934b) description in having following features : Length of Hindwing : 40.0 mm; Labium yellowish brown, labrum with two triangular yellowish green spots, anteclypeus yellowish green; Postclypeus black in the middle, broadly yellowish green on two sides, temple of frons greenish yellow; occiput yellow; marking on thorax yellowish green; fore femur dull yellow on inner side; discoidal cell in forewing four celled, while in the hind wing three celled; nodal index $\frac{13-22}{14-15}$/ $\frac{24-12}{14-14}$ Segment one of the abdomen yellow at the ventro-lateral junction.

TAXONOMIC STATUS OF ICTINOGOMPHUS DISTINCTUS RAM

Ram (1985) described the species from West Bengal. The type materials deposited in the National Zoological Collection at the Zoological Survey of India, Calcutta, were studied. The study revealed that the species is close to *Ictinogonphus rapax* (Rambur). More materials are needed to find out its actual status. Neither Davies and Tobin (1985) nor Tsuda (1991 & 2000) included it in the list of species under *Ictinogomphus* Cowley.

Genus *Gomphidia* Selys

Comphidia Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 86; Fraser, 1934, *Fauna Brit. India Odon.* **2** : 381; Lieftick, 1954, *Treubia* **22** (suppl.) : 78; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 34.

Type-species : *Gomphidia t-nigram* Selys

Distribution : India, Burma, Sri Lanka, Siam, Malayasia, Africa.

Gomphidia leonoraae Mitra

Figs. 125, 126

Gomphidia leonoraae Mitra, 1994, *Rec. zool. Surv. Occ. Pap.* No.166, p. 34.

Material examined : West Bengal : Bankura : Susunia Hill (277) 2♀, 2.viii.1974. Holotype (Registration No. 4128 H_{13} Paratype Reg. No. 4129/H_{13})

Abdomen : 57.00 mm (with appendages) Hind wing : 47.00 mm.

Head : Eyes deep bluish green; labium yellow in one and brown in other specimen; face, frons, labium bluish yellow; a black line on the floor of the sulcus of the frons as well as on the upper part in confluence with the vertex; a transverse black line on the lower part of the frons.

Prothorax : Lower part black, upper part of the middle lobe black, and two yellow marks on the sides.

Thorax : Black, marked with yellow stripe, a broad humeral stripe; humeral and postero-lateral sutures black, but the former is thicker than the latter.

Wings : Hyaline, but faintly enfumed throughout, costa yellow, pterostigma dark brown covering nearly eight cells; nodal

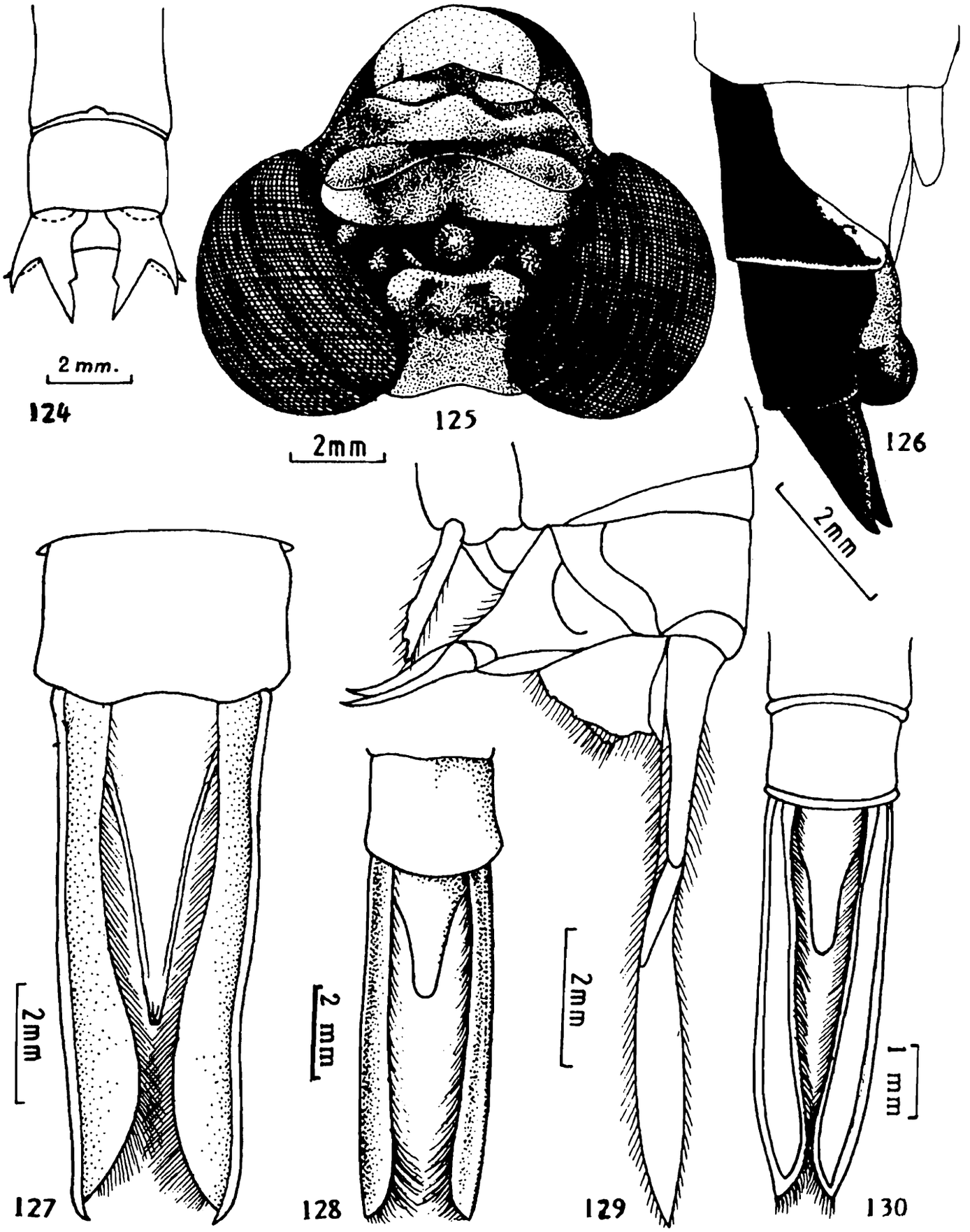


Fig. 124-130. 124. Anal appendages of male *Macrogomphus montanus* Selys (Dorsal view); 125. Markings on head of *Gomphidia leonoraae* Mitra; 126. End part of abdomen, anal appendages and genitalia of *Gomphidia leonoraae* Mitra; 127. Anal appendages of male *Gynacantha klasiaca* Mc Lachlan (Dorsal view); 128. Anal appendages of male *Gynacantha bayadera* Selys (Dorsal view); 129. Anal appendages and genitalia of female of the same; 130. Anal appendages of *Gynacantha dravida* Lieftinck (Dorsal view)

index $\frac{14-20}{12-15}/\frac{20-12}{13-11}$; discoidal cell of forewing with four cells and of hind wings with three cells; four cubital nervures in forewing, and two in the hind wing, subtrigone traversed once and hypertrigone traversed twice in both wings.

Abdomen : Black marked with yellow as follows : segment 1 with a fine apical dorsal ring; segment 3 with a long yellow spot except at the apex of third segment; 4-7 with yellow spot confluent except at the spices; 8 with a small basal spot while segments 9 and 10 are purely black; ventro-lateral spots on them are ochreous. The male was in tandem with the broken specimen and it appeared while on wing, identical to the female.

Remark : The specimens do not conform with any known species of the genus; although the size agrees with *G. krugeri* Martin but the color pattern of head and thorax vary widely. The late Dr. M.A. Lieftinck, Rhenen, The Netherlands and Mrs. L.K. Gloyd of Michigan, University, could not fit it with any known species, although Mrs. Gloyd informed its relation with *krugeri.*

N.B. The species has been named in honour of celebrated odonatologist Dr. Leonora K. Gloyd of the University of Michigan USA. Deposited in National Zoological Collection in Zoological Survey of India.

Family AESHNIDAE

Distribution : Cosmopolitan

Key to genera of family AESHNIDAE

1. Anal triangle absent; IR_3 not forked (if so weakly developed at the extreme apex of the wing) 2

– Anal triangle present; IR_3 forked near Pterostigma 3

2. Two rows of cells between the origins of Cu_2 and IA of the hindwing .... *Anax* Leach

– Three rows of cells between the origins of Cu_2 and IA of the hind wing .... *Hemianax* Selys

3. Anal loop nearly oval in shape .... *Gynacantha* Rambur

– Anal loop long and narrow .... *Anaciaeshna* Selys

Genus *Gynacantha* Rambur

Gynacantha Rambur, 1842, *Ins. Nevrop.* p. 209; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 95; 1962, *Rev. zool. Bot. Afr.* **65** : 1 Davies, 1981, *Synop. Ext. Gen. Odon.* p. 26

Type-species : *Gynacantha nervosa* Rambur

Distribution : Cosmopolitan

Key to species of genus *Gynacantha* Rambur

1. Discoidal cell and hypertrigone of the fore-wing traversed by different number of veins in different wings .... *rammohani* Mitra & Lahiri

– Discoidal cell and hypertrigone of fore wing traversed by a similar number of veins 2

2. Antenodals 17-19 in hind wings .... *subinterrupta* Rambur

Antenodals in 14-15 in hindwings .... *bayadera* Selys

– Antenodals in 20-21 in hindwings 3

3. 8-9 cells in anal loop...*khasiaca* McLachlan

– 12-17 cells in anal loop..*dravida* Lieftinck

Gynacantha dravida Lieftinck
(Fig. 130)

Gynacantha hyalina Selys, 1882, *An. Soc. Espan, Hist. Nat.* **118** : 19; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 97-100.

Gynacantha dravida Lieftinck, 1960. *Mem. Soc. ent. ital.* 38 : 252-253.

Material examined : Assam (22) 1♂, 12.vi.1986, West Bengal : Calcutta (52) 1♂, 30.ix.1983; 1♂, 30.viii.1968, Jalpaiguri (131a) 1♂, 20.viii.1983.

Distribution : *Present records* : Assam, West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Lahiri & Mitra 1974); Meghalaya (Lahiri 1987) *Southern India* : Coimbatore, Coorg, Malabar, Nilgiris, Wynaad (Fraser 1936a); Andaman (Lahari & Mitra 1993).

N.B. : Report of Lahiri and B. Mitra (1993) based on wrong determination.

Remark : A new record for Assam (Mitra 1994).

Intraspecific variation : Three male specimens from Nicobar Islands differ from specimens from West Bengal since the formers have face, labrum and labium ochreous, wings deeply enfumed with reddish brown.

Gynacantha bayadera Selys
(Figs. 128, 129)

Gynacantha bayadera Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10** (30) : 483; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 103-104; Lieftinck, 1954, *Treubia* **22** (suppl.) : 100.

Material examined : Nagaland : Dimapur : 1♀, 19.iii.1994; West Bengal : Calcutta (52) 1♀, 8.viii.1976, Santiniketan (255) 1♂, 6.vii.1991.

Distribution : *Present record* : West Bengal, Nagaland. *Past records* : INDIA : *Eastern India* : Sikkim (Selys 1891; Fraser 1922e, 1936a; Laidlaw 1923; Lieftinck 1948); Bengal (Fraser 1936a); Meghalaya (Lahiri 1987); *Central India* : Indravati Tiger Reserve (Mitra 1995b). Great Nicobar (Hämäläinen *et. al* 1999).

Elsewhere : ASIA : Burma (Fraser 1922e; Martin 1909); China (Fraser 1936a; Needham 1930); Formosa (Fraser 1936a); Siam (Laidlaw 1923) AUSTRALIA : Celebes (Fraser 1936a; Laidlaw 1923); New Guinea, Sundaic Archipelago (Martin 1909). Taiwan (Lieftinck *et. al.* 1984).

Intraspecific variation : It differs from Fraser's (1936a) description in having labium, labrum dull ochreous, clypeus greenish-yellow; thorax olivaceous brown; wings enfumed with yellow; pterostigma pale yellow, covering more than three cells; 8 cubital nervures in fore wings; 7 in the hind wings; nodal index $\frac{18-24}{19-16}/\frac{24-19}{18-19}$ abdomen brown.

Gynacantha khasiaca MacLachlan
(Fig. 127)

Gynacantha khasiaca MacLachlan, 1896, *Ann. Mag. Nat. Hist.* (6) **17** : 411; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 113-114.

Material examined : West Bengal : Kochbehar (166), 1♂, 3.ix.1983.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Khasia Hills (Fraser 1922e; Kimmins 1969; MacLachlan 1896); Assam (Laidlaw 1923; Fraser 1936a); Bengal (Fraser 1936a) : Abor Hills (Laidlaw 1914).

Elsewhere : ASIA : Annam (MacLachlan 1896b); Burma (Fraser 1922e, 1936a).

Gynacantha subinterrupta Rambur
(Fig. 131)

Gynacantha subinterrupta Rambur, 1842, *Ins. Nevrop.* p. 212; Fraser, 1936 *Fauna Brit. India Odon.* **3** : 100-101.

Material examined : Mizoram : Aizawl (281b) 1♂, 24.x.1991.

Distribution : *Present record* : Mizoram. *Past records* : INDIA : Great Nicobar Is. (Mitra 1995a).

Elsewhere : ASIA : Burma, China, Indonesia, Kampuchea, Malaysia, Philippines, Thailand, Vietnam (Tsuda 1991).

Remark : New record from India.

Gynacantha rammohani Mitra & Lahiri
(Fig. 14)

Gynacantha rammohani Mitra & Lahiri, 1975, *Ent. Rec. J. Var.* **87** : 148-149. Mitra, 1983, *Ent. Mon. Mag.* **119** : 30.

Material examined : West Bengal : Calcutta (52) 1♀, 10.viii.1969.

Distribution : West Bengal.

Remarks : Status doubtful; seems to be an abnormal form of *G. dravida* Lieft.

Genus *Anax* Leach

Anax Leach, 1815, *Edinb. Encycl.* **9** : 137 : Fraser, 1936, *Fauna Brit. India Odon.* **3** : 134; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 26.

Type-species : *Anax imperator* Leach

Distribution : Cosmopolitan

Key to species of Genus *Anax* Leach

Abdomen pale blue with black markings ... . *imperator imperator* Leach

Segment 1 of abdomen pale green .... *guttatus* (Burmeister)

Segmnt 1 of abdomen olivaceous brown..... .....*parthenope parthenope* (Selys)

Anax imperator imperator Leach

Anax imperator Leach, 1815, *Edinb. Encycl.* **9** : 137. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 136-138; Mitra, 1983, *Ent. Mon. Mag.* **119** : 30.

Anax imperator imperator, Tsuda 1991. *A distributional list of Odonata, 1991,* p. 117.

Material examined : West Bengal : Calcutta (52) 1♀, 5.ii.1970.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Mitra & Lahiri 1974).

Elsewhere : ASIA : Afghanistan (Tsuda 1986) Mussorie, N.W. Province of Pakistan (Fraser 1936a); Central Asia (Fraser 1936a). AFRICA (Dumont 1983); Somaliland (Carfi 1974); Moroccan Sahara (Dumont 1976); Madagascar (Fraser 1956); EUROPE : Kanton Graubunden (Schiess & De Marmels 1979); France (Francez & Brunches 1983); Germany (Benken 1980; Donath 1983; Korman 1966); Switzerlands (De Marmels 1979); Netherlands (Wasscher 1979). Austria, Belgium, Czechoslovakia, Greece, Great Britain, Hungary, Spain (Tsuda 1991).

Remark : A new record from the Oriental region.

Anax guttatus (Burmeister)

Anax guttatus Burmeister, 1839. *Handb. Ent.* **2** : **840;** Fraser, 1936 *Fauna Brit. India Odon.* **3** : **140-142.** Lieftinck, 1954, *Treubia,* **22** (suppl.) : 110.

Material examined : Arunachal Pradesh : Subansiri 1♂, 5.v.1966, Orissa : Keonjhar (159), 1♀, 27.ix.1972.

Distribution : *Present record* : Arunachal Pradesh and Orissa. *Past records* : INDIA : *Eastern India* : Calcutta (Ram *et. al.* 1982); Chilka Lake, Ganjam (Fraser 1921c); North Lakhimpur (Laidlaw 1914); Assam (Fraser 1936a). Meghalaya (Lahiri 1987). *Central India* : Bastar (Prasad 1996a). *Southern India* : Glenburi, Nilgiris (Bhasin 1953); Coorg, Deccan, Kanara, Malabar Nilgiris (Fraser 1931a); Coorg, Nilgiris, Annaimalai Hills, Madras, Waltair (Fraser 1936a). *Northern India* : Punjab (Bhasin 1953); *Western India* : Bombay, Poona (Fraser 1921c); Maharashtra (Prasad 1996b). Andaman Is. (Lahiri & Mitra 1993).

Elsewhere : ASIA : Burma (Fraser 1936a); Borneo, Ceylon (Laidlaw 1923); Formosa (Needham 1930); Japan (Ikezaki 1971); Taiwan Lieftinck *et. al.* 1984) Malaya Peninsula (Laidlaw 1923); Siam, Sumatra (Fraser 1936a); AUSTRALIA : Queensland (Martin 1908); Micronesia (Lieftinck 1962); AFRICA (Pinhey 1962) Seychelles (Blackman & Pinhey 1967).

Remark : New record from Arunachal Pradesh (Mitra 1994).

Intraspecific variation : The specimen varies from Fraser's (1936a) description in having labium and labrum rust red; black line on labrum light; frons pale blue, wing membrane pale brown.

Anax parthenope parthenope Selys

Aeshna (Anax) parthenope Selys, 1839, *Bull. Acad. Belg.* (2) **6** : 389.

Anax parthenope parthenope, Tsuda, 1991, *A distributional list of World Odonata,* 1991. p. 120.

Anax bucclus Hagen, 1867, *Verh. Zool. bot. Ges. Wien.* **17** : 48 *(Vide* Tsuda 2000).

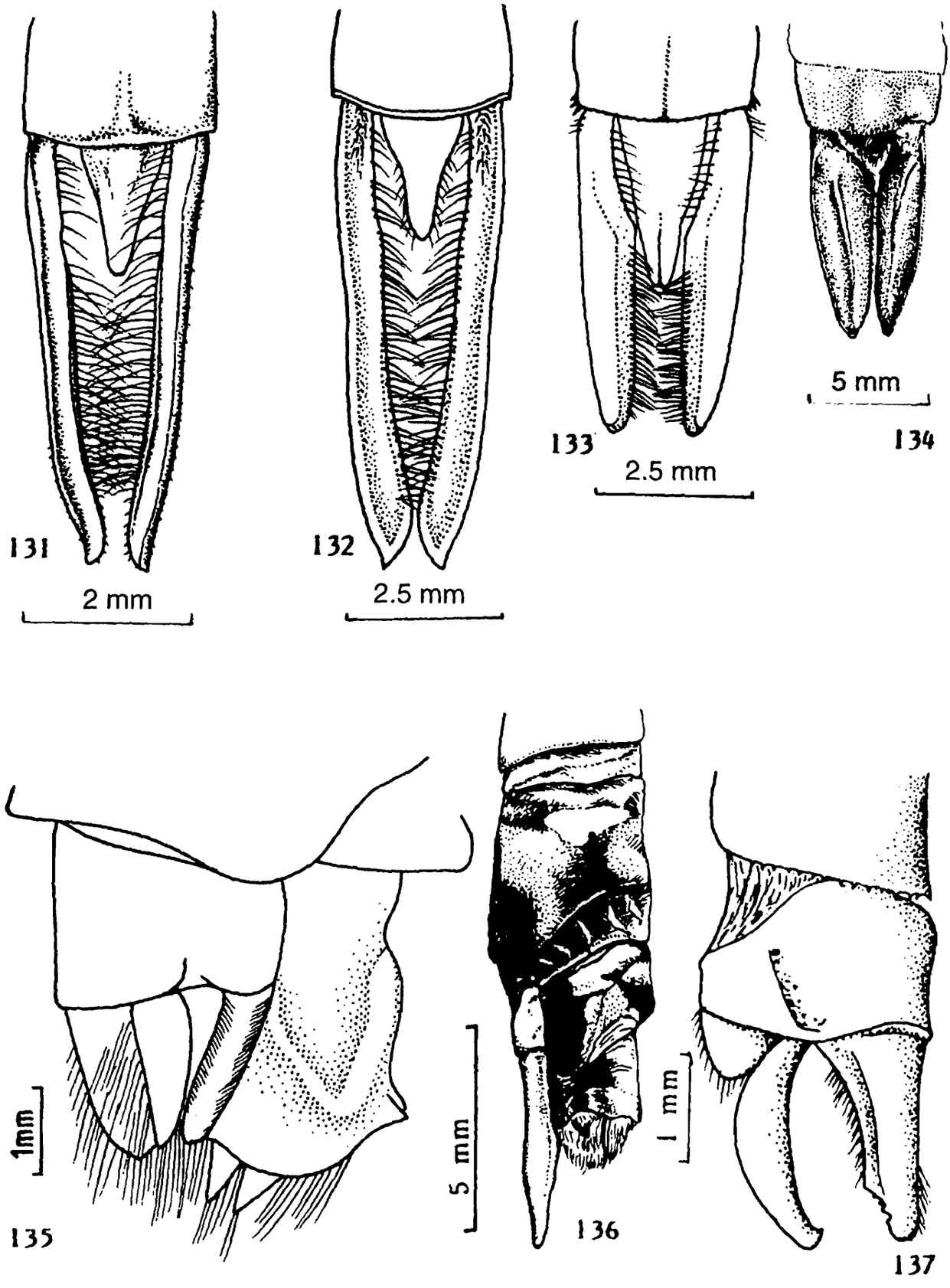


Fig. 131-137. 131. Anal appendages of male *Gynacantha subinterrupta* Rambur (Dorsal view); 132. Same of male *G. bainbriggei* Fraser (Dorsal view) 133. Same of *Anaciaeschna jaspedia* (Burmeister) (Dorsal view); 134. Same of *Hemianax ephippiger* (Burmeister) (Dorsal view); 135. Anal appendages and genitalia of female *Chlorogomphus p. preciosus* (Fraser) (Right lateral view); 136. Same of *Anotogaster nipalensis* Selys (Right lateral view); 137. Anal appendages of male *Epophthalmia v. vittata* Burm. (Left lateral view)

Material examined : Assam : Barpeta (3), 1♂, 6.iv.1986.

Distribution : *Present record* : Assam. *Past records* : INDIA : *Northern India* : Kashmir (Fraser 1936a); *Western India.* West coast of India (Fraser 1936a); *Southern India :* Deccan (Fraser 1936a)

Elsewhere : ASIA : Afghanistan, Iraq (Tsuda 1991). Asia Minor, NORTH AFRICA, SOUTH EUROPE (Fraser 1936a).

Genus ***Anaciaeschna*** Selys

Anaciaeschna Selys, 1878, *Mitth. Mus. Dresden* **3** : 317; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 150; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 26.

Type-species : *Aeshna jaspedia* Burmeister

Distribution : East and West Palearctic; Oriental, Ethiopean and Australian regions.

Anaciaeschna jaspedia (Burmeister)
(Fig. 133)

Aeschna jaspedia Burmeister, 1836, *Handb. Ent.* **2** : 840.

Anaciaeschna jaspedia Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 86. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 152-154.

Material examined : Assam : Barpeta (3) 1♀, 6.iv.1986. West Bengal : Calcutta 1♂, 21.viii.1965; 1♂, 11.x.1973.

Distribution : *Present records* : Assam and West Bengal. *Past records* : INDIA : *Eastern India* : North Bengal (Fraser 1922c); Calcutta (Ram *et. al.* 1982); *Southern India* : Coorg, Nilgiris, Travancore (Fraser 1931a); Great Nicobar Island (Mitra 1995a).

Elsewhere : ASIA : Burma (Fraser 1922c; Laidlaw 1923); Borneo, Java, Formosa, Lombok (Martin 1908); Sumatra (Fraser 1922c); Micronesia (Lieftinck 1962); Tahiti (Fraser 1922c); New Guinea to Pacific (Laidlaw 1923).

Intraspecific variation : One male specimen from the Great Nicobar Island differs from West Bengal forms, under study, as well as from Fraser's (1936a) description since the former possesses reddish brown labrum and face; the lateral yellow marking on the thorax extends up to the first abdominal segment; yellow enfumation present only in the centre the hind wing.

Genus ***Hemianax*** Selys

Hemianax Selys, 1883, *Bull. Acad. Belg.* (3) **5** : 723; Fraser 1936, *Fauna Brit. India Odon.* **3** : 146; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 26.

Type-species : *Aeshna ephippiger* Burmeister

Distribution : Europe, Africa, Asia, Australia, Papua.

Hemianax ephippiger (Burmeister)
(Fig. 134)

Aeshna ephippiger Burmeister, 1839, *Handb. Ent. Band* p. 840.

Hemianax ephippiger Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 85. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 147-149.

Material examined : Assam : Sangsak 1♀, 18.ix.1975; Orissa : Cuttack (74) 1♂, 30.xi.1971; Gopalpur (117) 1♂, 22.xi.1973; West Bengal : Calcutta (52) 1♀, 30.vi.1966; Barrackpore (24) 1♀, 15.viii.1973.

Distribution : *Present records* : Assam, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Mitra 1983); *Northern India* : Rajasthan (Bose & Mitra 1976); *Western India* : Bombay, Poona (Fraser 1924b); Gujarat (Fraser 1921c); Maharashtra (Prasad 1996b). *Southern India* : Cochin, Coorg, Deccan, Kanara, Malabar (Fraser 1931a); Madras (Pinhey 1981).

Elsewhere : ASIA : Baluchistan (Fraser 1919); China (Klots 1947, Needham 1930) Persia (Fraser 1921c); Iraq (Bhasin 1953), AFRICA : Ethiopea (Pinhey 1981a); Kusunga, Kimbe, Nyasaland (Pinhey 1979c); Mauretania, Moroccan Sahara (Dumont 1976); Macambique (Pinhey 1981b) Malawi (Pinhey 1966a 1979b) Garamba National Park (Pinhey 1966b); Ngamiland (Pinhey 1967); Somaliland

(Carfi 1974); Angola (Pinhey 1975) Tanzania (Pinhey & Pinhey 1984); Zambezi river (Pinhey 1979a); Madagascar (Fraser 1956) EUROPE : France (Dommanget 1981); German & Corcica (Lohman 1979); Spain (Romero 1983); Switzerland (De Marmels 1979). Greece (Battin 1989).

Remark : New record from Assam and Orissa (Mitra 1994).

Intraspecific variations : The specimens varies from Fraser's (1936a) description since they have dark grey crest on frons. One female specimen from Rajasthan differs from the females under study, since it lacks reddish brown colour in the region between MA and IA.

Superfamily CORDULEGASTEROIDEA

Distribution : Cosmopolitan.

Family CORDULEGASTERIDAE

Distribution : Cosmopolitan.

Key to genera of family CORDULEGASTERIDAE

Median space entire, female with a well developed vulvar scale .....*Anotogaster* Selys

Median space traversed, female with insignificant vulvar scale .... *Chlorogomphus* Selys

Genus ***Anotogaster*** Selys

Anotogaster Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 101 : Selys, 1857, *Mon. Gomph.* p. 322; Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 79; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 44; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 36.

Type-species : *Anotogater nipalensis* Selys.

Distribution : Oriental and Palearctic regions.

Anotogaster nipalensis Selys (Fig. 136)

Anotogaster nipalensis Selys, 1850, *Bull. Acad. Belg.* (2) **21** : 102; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 50-51.

Material examined : West Bengal : Darjeeling (189) 1♀, 22.v.1975.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling, Gopaldhara Assam (Fraser 1923a); Sikkim (Fraser 1936a).

Elsewhere : ASIA : Nepal (Asahina 1955; Fraser 1923a; 1936a; Kimmins 1969; St. Quentin 1970); Bangladesh (Tsuda 1991).

Genus ***Chlorogomphus*** Selys

Chlorogomphus Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 98-99. Selys, 1857, *Mon. Gomph.* p. 311; Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 78; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 5; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 35.

Type-species : *Chlorogomphus magnificus* Selys.

Distribution : Oriental and Palaearctic regions.

Key to species of genus *Chlorogomphus* Selys

Face without yellow marking ....*atkinsoni* (Selys)

Face with citron yellow marking..... ..... *preciosus preciosus* (Fraser)

Chlorogomphus preciosus preciosus (Fraser) (Fig. 135)

Orogomphus speciosus Laidlaw (nec. Selys) 1915, *Rec. Indian Mus.* **11** : 198.

Orogomphus preciosus Fraser, 1924, *Mem. Dept. Agric. India (Ent.)* **8** : 75-76.

Chlorogomphus precious Fraser, 1936, *Fauna Brit. India, Odon.* **3** : 19-22.

Material examined : West Bengal : Darjeeling (266) 1♀, 9.iv.1973.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling (Fraser 1936a; Laidlaw 1915a); Sikkim (Fraser 1936a).

Elsewhere : ASIA : Burma and Nepal (Tsuda 1991).

Intraspecific variation : The specimen differs from Fraser's (1936a) description due to its rust red frons, nodal index $\frac{15\text{-}20}{15\text{-}19}/\frac{20\text{-}11}{18\text{-}15}$

Chlorogomphus atkinsoni (Selys)

Orogomphus atkinsoni Selys, 1878, *Bull. Acad. Belg.* (2) **46** :

Chlorogomphus atkinsoni Fraser, 1936, *Fauna Brit. India Odon.* **3** : 26-28.

Material examined : West Bengal : Darjeeling (189) 1♂

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Darjeeling (Asahina 1961c); Assam, Sibsagar (Laidlaw 1915a); Bengal (Laidlaw 1915a, Williamson 1907); Kurseong (Fraser 1923a); Meghalay (Lahiri 1987). *Northern India* : Kumaon (Laidlaw 1915a); Bhowali, Nainital, (Bhasin 1953).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Intraspecific variation : The specimen varies from Fraser's (1936a) description due to the possession of brown labium rusty brown prothorax, blackish brown thorax.

Superfamily LIBELLULOIDEA

Distribution : Cosmopolitan

Key to Families of Superfamily LIBELLULOIDEA

Eyes with a small sinuous projection at the middle of the posterior border; thorax metallic blue or green; tibiae of male with a keel on flexor surface ..... Corduliidae

Eyes without a projection at the middle of the posterior border; thorax rarely metallic colour; tibiae of males without a keel on flexor surface ..... Libellulidae

Family CORDULIIDAE

Distribution : Nearctic, Palearctic, Oriental and Australian regions.

Key to Genera of Family CORDULIIDAE

Discoidal cell of forewing traversed ..... *Epophthalmia* Burmeister

Discoidal cell of forewing entire ..... *Macromia* Rambur

Genus *Macromia* Rambur

Macromia Rambur, 1842, *Ins. Névrop.* p. 137; Martin, 1906, *Cat. Coll. Selys (Cordulines)* fasc. **17** : 57, 58, 65; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 161; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 39.

Type-species : *Macromia cingulata* Rambur

Distribution : Cosmopolitan

Macromia moorei moorei Selys
(Fig. 138)

Macromis moorei Selys, 1874, *Bull. Acad. Belg.* (2) **37** : 28; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 164-166.

Macromia moorei moorei Lieftinck, 1954, *Treubia* **22** (suppl.) : 119

Material examined : Assam : Goalpara 1♂, 12.vi.1973.

Distribution : *Present record* : Assam. *Past records* : INDIA : *Eastern India* : Bengal (Martin 1906); Assam, Khasi Hill, Shillong (Fraser 1921b); *Northern India* : Uttar Pradesh (Kumar 1982); Naini Tal (Shani 1964); Dehra Dun, Almora Bhatronj, Dehra Dun (Bhasin 1953); Himachal Pradesh (Lahiri 1987). *Southern India* : Deccan (Fraser 1921b).

Elsewhere : ASIA : Burma, Tonkin (Martin 1906); Nepal (St. Quentin 1970).

Remark : New record from Brahmaputra valley (Assam) (Mitra 1994).

Intraspecific variation : It varies from Fraser's (1936a) description in having yellow labium, rudiment of dark rays in the wings.

Genus *Epophthalmia* Burmeister

Epophthalmia Burmeister, 1839, *Handb. Ent.* **2** : 844; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 192; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 39.

Type-species : *Epophthalmia vittata* Burmeister

Distribution : India, Burma, Sri Lanka, Malayasia, Java, Borneo, Celebes, China, Japan.

Key to species of genus *Epophthalmia* Burmeister

4-5 cubital nervures in fore wing; anal loop with 10-11 cells ..... *vittata vittata* Burm.

6-7 cubital nervures in forewing; anal loop with 12-13 cells ..... *vittigera bellicosa* Lieft.

Epophthalmia vittata vittata Burmeister (Fig. 137)

Epophthalmia vittata Burmeister, 1839, *Handb. Ent.* **2** : 845; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 194-196; Lieftinck, 1954, *Treubia* **22** (suppl.) : 114.

Material examined : Bihar : Palamau (222) 1♂, 20.vi.1983; West Bengal, Calcutta 1♂, 8.iv.1941.

Distribution : *Present records* : Bihar and West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Ram *et. al.* 1982); Bengal (Lieftinck 1931); *Northern India* : Almora, Bhatronj (Bhasin 1953); *Southern India* : Deccan, Coimbatore, Malabar, Waltair (Fraser 1936a), Madras (Fraser 1921b). *Western India* : Poona, Khandala (Fraser 1936a).

Elsewhere : ASIA : Thibet (Lieftinck 1931)

Remark : A new record from Bihar.

Intraspecific variation : The specimen from Bihar varies from the specimen from Calcutta in having reddish brown labium, labrum and the nodal index $\frac{7\text{-}15}{9\text{-}11}/\frac{15\text{-}7}{11\text{-}9}$.

Epophthalmia vittigera bellicosa Lieftinck

Macromia vittigera Rambur, 1842, *Ins. Nevrop.* p. 140.

Epophthalmia vittigera Selys, 1871, *Bull. Acad. Belg.* (2) **31** : 533; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 202-204.

Epophthalmia vittigera bellicosa, Tsuda, 1991, *A distributional list of World Odonata, 1991* p. 133.

Material examined : West Bengal : Midnapore (193) 1♀, 3.vi.1971.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Assam (Fraser 1921b; Martin 1906).

Elsewhere : ASIA : Burma, Thailand, Vietnam (Tsuda 1991). Bangka, Billiton, Bali (Lieftinck 1954).

Remark : A new record from West Bengal.

Intraspecific variation : The specimen varies from the description provided by Fraser (1936a) in having yellowish apical veins.

Family LIBELLULIDAE

Distribution : Cosmopolitan

Key to genera of family LIBELLULIDAE

1. Sectors of arc united at origin in forewing, venation close 2
- Sectors of arc divergent at origin in forewing, venation open 27
2. Base of discoidal cell in hindwing distal to the arc; costal side of the discoidal cell in the forewing angulated; anal loop ill developed 3
- Base of discoidal cell in hindwing at the level of the arc; costal side of the discoidal cell in the forewing not angulated; anal loop well developed 4
3. 9-12 antenodal nervures in forewing ..... *Tetrathemis* Selys
- 14 or more antenodal nervures in forewing ..... *Hylaeothemis* Ris
4. Claw hooks equal in length to the claws; thorax metallic ..... *Zygonyx* Selys
- Claw hooks shorter than claws; thorax usually non metallic 5
5. Anal loop open 6
- Anal loop closed 7
6. Abdomen broad at base then tapering gradually to the end; hindwing with an opalescent white sopt ... *Tholymis* Hagen
- Abdomen enormously swollen at base and suddenly narrowed, slim at the end; wings hyaline ..... *Zyxomma* Rambur
7. Distal antenodal nervure in forewing complete 8

- Distal antenodal nervure in forewing incomplete 13

8. Posterior lobe of prothorax fringed with stiff hairs 9

- Posterior lobe of prothorax usually naked 11

9. Upper surface of frons metallic .... *Brachydiplax* Brauer

- Upper surface of frons non-metallic ... 10

10. Only 6 antenodals in forewing .... *Acisoma* Rambur

- 7 or more antenodals in forewing .... *Orthetrum* Newman

11. Only 1 cubital nervure in all wings .... *Cratilla* Kirby

- 2 or more cubital nervures in all wings 12

12. Anal loop short made of six cells ....*Amphithemis* Selys

- Anal loop long with dilated end, strongly angulated distal side .... *Lyriothemis* Brauer

13. Cu_2 seperated from the posterior angle of the discoidal cell 14

- Cu_2 in proximity with the posterior angle of the discoidal cell 15

14. Abdomen 22-23 mm ..... *Indothemis* Ris

- Abdomen 25-26 mm ..... *Rhodothemis* Ris

15. Posterior lobe of prothorax small and naked 18

- Posterior lobe of prothorax erect and with hairs 16

16. Borders of the discoidal field in forewing converge at the wing border .... *Sympetrum* Newman

- Borders of the discoidal field in forewing divergent at the wing border 17

17. Blackish brown mark at the node of the wings ..... *Palpopleura* Rambur

- Wings usually hyaline .. *Diplacodes* Kirby

18. Sectors of arc in forewing separated at the origin and united in the hindwings ..... *Rhyothemis* Hagen

- Sectors of arc in forewing arising from a common stalk in both wings 19

19. Discoidal field converge at the wing border 20

- Discoidal field diverge at the wing border 21

20. A supplimentary nervure IR_2 between R_2 and R_3 ..... *Pantala* Hagen

- No supplementary nervure between R_2 and R_3 ..... *Trithemis* Brauer

21. Pterostigma short and unequal in both wings ..... *Tramea* Hagen

- Pterostigma long and equal in both wings 22

22. Pterostigma bicolorous (Black & white). ..... *Bradinopyga* Kirby

- Pterostigma unicoloureus 23

23. 2 or more cubital nervures in wings ....*Neurothemis* Brauer

- Only 1 cubital nervure in wings 24

24. Red, ochreous or pale yellow coloured species 25

- Variably coloured species 26

25. Smaller species (Abdomen 18-20 mm) $6\frac{1}{2}$-$7\frac{1}{2}$ antenodals in forewings .... *Brachythemis* Brauer

- Larger species (Abdomen 24-26 mm); $9\frac{1}{2}$ or more antenodals in forewings ....*Crocothemis* Brauer

26. Arc in proximation with the second antenodal; one row of cell between IR_3 and R_{spl} ..... *Lathrecista* Kirby

- Arc lies between the second and third antenodal; 2 rows of cells IR_3 and R_{spl} .... *Potamarcha* Karsch

27. Subtrigone in forewing single celled .... *Aethriamanta* Kirby

– Subtrigone in forewing three celled ... 28

28. Base of discoidal cell of hindwing distinctly proximal to the arc .... *Macrodiplax* Brauer

– Base of discoidal cell of the hindwing at the level of the arc ..... *Urothemis* Brauer

Genus ***Urothemis*** Brauer

Urothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien* 18 : 175; 366, 737. Fraser, 1936, *Fauna Brit. India Odon.* 3 : 441; Lieftinck, 1954, *Treubia*, 22 (suppl.) : 169; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 51.

Type-species : *Urothemis bisignata* Brauer

Distribution : India, Bangladesh, Tibet, China, Sri Lanka, Burma, Thailand, Vietnam, Malayasia, Indonesia, New Guinea, Philippines, Australia, Africa, Madagascar.

Urothemis signata signata (Rambur) (Fig. 139)

Libellula signata Rambur, 1842, *Ins. Nevrop.* p. 117.

Urothemis signata signata, Fraser, 1936, *Fauna Brit. India Odon.* **3** : 442-444; Lieftinck, 1954, *Treubia* **22** (suppl.) : 170.

Material examined : Assam : Kaziranga (156) 1♂, 2.ix.1974; Silchar (98) 1♂, (238) 1♀, 29.v.1979; Manipur : Moirang (202) 3♂, 2♀, 29.v.1974; Orissa : Sundergarh (275) 1♂, 23.ix.1972; West Bengal : Bankura (38a) 1♂, 2♀, 4.viii.1974; Birbhum (271) 1♂, 12.ix.1974; (255) 1♂, 1♀, 14.ix.1974; Calcutta (52) 1♂, 7.v.1967; 1♂, 25.v.1980 24 Parganas (124) 2♀, 17.viii.1973; 1♂, 18.viii.1973. 1♂, 1♀, 20.viii.1973; 2♂, 21.viii.1973; 1♂, 22.viii.1973; 1♂, 1♀, 23.viii.1973; 1♂, 4♀, 26.viii.1973; (24a) 2♂, 7.ix.1974; (117a) 2♂, 12.ix.1974; (24a) 1♂, 27.ix.1974.

Distribution : *Present records* : Assam, Manipur, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1920b) Calcutta (Mitra 1983); Barkuda Island (Fraser & Dover 1922); Bhubaneswar (Dasgupta 1957); Meghalaya (Lahiri 1987). *Southern India* : Cochin, Coorg, Deccan, Kanara, Malabar (Fraser 1931a); Bangalore, Madras (Fraser 1920b), *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); *Western India* : Bombay, Poona (Fraser 1920b).

Elsewhere : ASIA : Burma (Fraser 1936a); China, Formosa (Needham 1930); Indo-China, Malayasia (Fraser 1936a); Nepal (Kiauta 1974) Ceylon (Fraser 1920b). Thailand (Titayavan 1979); Vietnam (Tsuda 1991).

Intraspecific variation : Only male specimens vary from Fraser's (1936a) description due to the possession of red labium and labrum.

Genus ***Aethriamanta*** Kirby

Aethriamanta Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 262, 283. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 444; Lieftinck, 1954, *Treubia* **22** (suppl.) : 170; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 51.

Type-species : *Libellula brevipennis* Rambur

Distribution : East Palearctic, Oriental, Africa, Madagascar, Australia.

Aethriamanta brevipennis (Rambur)

Libellula brevipennis Rambur, 1842, *Ins. Nevrop.* p. 114.

Aethriamanta brevipennis, Kirby, 1889, *Trans. zool. Soc. Lond.* 12 : 283. Schmidt, 1934, *Arch. Hydrobiol. Suppl.* 13 : 385. Lieftinck, 1954, *Treubia* 22 (suppl.) : 171; Tsuda, 1991. *A distributional list of World Odonata, 1991* p. 144.

Athriamanta brevipennis brevipennis, Fraser, 1936, *Fauna Brit. India, Odon.* 3 : 445-447.

Material examined : Arunachal Pradesh : Maghagaon (181) 1♀, 30.v.1966; Orissa : Cuttack (74) 1♂, 25.iii.1974 (275) 1♂, 23.ix.1972, West Bengal : Bankura (38a) 4♀, 4.viii.1974; Calcutta (52) 1♂, 11.viii.1968.

Distribution : *Present records* : Arunachal Pradesh, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Selys 1891); Bengal, Chilka, Ganjam (Fraser 1920b); Barkuda Island (Fraser & Dover 1922) : Assam (Fraser 1936a); Howrah (Dasgupta 1957). *Southern India* : Coorg, Malabar, Palghat (Fraser 1924b; 1931a).

Elsewhere : ASIA : Burma, Ceylon (Fraser 1920b); Bhamo, Sylhet (Selys 1891). Malayasia (Lieftinck 1954). Thailand (Tsuda 1991).

Remark : A new record from Arunachal Pradesh (Mitra 1994)

Intraspecific variations : The male specimen from Orissa differs from the specimen from Calcutta since the latter have brown labrum anteclypeus and lower border of frons. The female specimen of West Bengal and Arunachal Pradesh differ from Fraser's (1936a) description in having labrum without glossy black; anal appendage dark brown.

Genus ***Macrodiplax*** Brauer

Macrodiplax Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 366, 737 Fraser, 1936, *Fauna Brit. India Odon.* **3** : 447; Lieftinck, 1954, *Treubia* **22** (suppl.) : 172; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 51.

Type-species : *Diplax cora* Brauer

Distribution : Cosmopolitan.

Macrodiplax cora (Brauer)

Diplax cora Brauer, 1867, *Verh. zool. -bot. Ges. Wien.* **17** : 20.

Macrodiplax cora Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* 18 : 737. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 448-450., Lieftinck, 1954, *Treubia* **22** (suppl.) : 172.

Material examined : Orissa : Chilka (67) 1 ♀, 17.vi.1986; 2 ♀, 25.vi.1986; Puri (233) 1 ♂, 17.iii.1974; West Bengal : Calcutta (52) 1 ♀, 23.vii.1967; 24 Parganas (124) 1 ♂, 22.viii.1973.

Distribution : *Present records* : Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Barkuda Island (Fraser & Dover 1922); Calcutta (Mitra 1983); *Southern India* : Madras (Fraser 1920b).

Elsewhere : ASIA : South Asia (Fraser 1936a); Ceylon (Lieftinck 1971b); Indonesia, Japan, Malayasia, Philippines, Thailand, Taiwan (Tsuda 1991). AFRICA : Mocambique, Ethiopea (Pinhey 1981b); Somaliland (Carfi 1974); Madagascar (Fraser 1956), AMERICA (Borror 1945).

Genus ***Tetrathemis*** Brauer

Tetrathemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 182 369, 727; Ris, 1909, *Cat. Coll. Selys (Libellulinen)* p. 17; 44-46. Fraser, 1936, *Fauna Brit. India Odon.* **3** : 248; Lieftinck, 1954, *Treubia* **22** (suppl.) : 124; Davies, 1981. *Synop. Ext. Gen. Odon.* p. 42.

Type-species : *Tetrathemis irregularis* Brauer

Distribution : India, Sri Lanka, Burma, Thailand, Malayasia, Indonesia, New Guinea, Philippines, Australia, Africa, Madagascar.

Tetrathemis platyptera Selys

Tetrathemis platyptera Selys, 1878, *Mitt. Mus. Dresden.* p. 316. Ris, 1909, *Cat. Coll. Selys (Libellulinen)* p. 45; 50-51; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 250-251; Lieftinck, 1954, *Treubia* **22** (suppl.) : 125.

Material examined : Arunachal Pradesh : Tirap (285a) 1 ♀, 10.xi.1971.

Distribution : *Present record* : Arunachal Pradesh. *Past records* : INDIA : *Eastern India* : Bengal (Ris 1909a); Meghalaya (Lahiri 1987) *Southern India* : Annaimalai, Bolovomputtis, Cochin, Coorg, Kanara, Malabar Nilgiris (Fraser 1931a). *Western India* : Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma, Malacca, Siam, (Fraser 1936a). China, Indonesia, Malayasia, Thailand (Tsuda 1991).

Remark : A new record from Arunachal Pradesh (Mitra 1994).

Intraspecific variations : The specimen varies from the description present in the Fauna of British India (vol. 3) in having labium yellow, bases of lateral lobes of labium black; labrum dark brown; basal spots bluish yellow.

Genus ***Hylaeothemis*** Ris

Hylaeothemis Ris, 1909, *Cat. Coll. Selys. fasc.* 9 : 19; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 260; Lieftinck, 1954, *Treubia* 22 (suppl.) 126; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 41.

Type-species : *Hylaeothemis clementia* Ris.

Distribution : Oriental Region.

Hylaeothemis fruhstorferi apicalis Fraser (Fig. 144)

Tetrathemis fruhstorferi Karsch, 1899, *Ent. Nachr.* **15** : 321; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 261-262.

Hylaeothemis indica Fraser, 1946, *Proc. R. ent. Soc. Lond.* (B) **15** : 97-100.

Hylaeothemis fruhstorferi apicalis, Tsuda, 1991, *A distributional list of World Odonata, 1991* p. 157.

Material examined : Orissa : Kotagarh (171) 1♂, 24.v.1972.

Distribution : Present record : Orissa. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh (Lahiri 1985). *Southern India* : Annaimalai, Cochin, Coorg, Malabar, Mercara, Nilgiris, Travancore (Fraser 1931a).

Remark : An addition to the fauna of Orissa.

Intraspecific variation : It differs from Fraser's (1936a) description due to the possession of yellow marking on thorax, cubital nervures in both wings, absence of middorsal marking on segment 1 of the abdomen.

Genus *Lyriothemis* Brauer

Lyriothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* 18 : 180; Fraser, 1936, *Fauna Brit. India. Odon.* 3 : 263; Lieftinck, 1954, *Treubia* 22 (suppl.) : 129; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 45.

Type-species : *Lyriothemis cleis* Brauer

Distribution : India, Tibet, China, Burma, Thailand, Vietnam, Malayasia, Indonesia, New Guinea, Japan, Ryuku, Philippines, Pacific Islands.

Key to species of genus *Lyriothemis* Brauer

The nervures R_3, IR_3, R_{4+5} and MA suddenly curved downwards at the wing border .... *cleis* Brauer

The nervures R_3, IR_3, R_{4+5} and MA gradually curved downwards at the wing border .... *bivittata* (Rambur)

Lyriothemis bivittata (Rambur) (Figs. 141, 142)

Libellula bivittata Rambur, 1842, *Ins. Nevrop.* p. 75; *Lyriothemis bivittata* Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 269-270.

Material examined : Sikkim : Khanikhola (159b) 1♀, 6.vii.1979.

Distribution : *Present record* : Sikkim. *Past records* : INDIA : *Eastern India* : Darjeeling, Sibsagar, Nowgong, (Fraser 1936a); Sikkim (Prasad & Ghosh 1984b).

Elsewhere : ASIA : Bangladesh, Burma, Laos, Malayasia, Nepal, Thailand, Vietnam (Tsuda 1991).

Intraspecific variation : The specimen differs from Fraser's (1936a) description since the brown stripe of the hindwing extends up to the seventh antenodal nervure.

Lyriothemis cleis Brauer (Fig. 143)

Lyriothemis cleis Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 181; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 267-269; Lieftinck, 1954, *Treubia* 22 (suppl.) : 129.

Material examined : Assam : Goalpara (235) 1♀, 15.vi.1973.

Distribution : *Present record* : Assam. *Past records* :

Elsewhere : ASIA : Burma (Fraser 1918b); Phillippines, Celebes (Fraser 1936a) : Malayasia (Lieftinck 1954); Borneo (Fraser 1936a, Kimmins 1966); Thailand (Tsuda 1991).

Remark : An addition to the fauna of India (Mitra 1994).

Intraspecific variation : The specimen varies from Fraser's (1936a) description in having dorsum of thorax reddish brown; two dark stripes over the lateral sutures, dark brown streak at the subcostal and cubital space; pterostigma dark reddish brown.

Genus *Amphithemis* Selys

Amphithemis Selys, 1891 *Ann. Mus. Civ. Genova*, 30 : 454; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 254, Tsuda, 1991, *A distributional list of World Odonata* 1991 p. 145.

Type-species : *Amphithemis curvistyla* Selys.

Distribution : Burma, India, Malayasia, Thailand, Laos, Vietnam.

Amphithemis curvistyla Selys

Amphithemis curvistyla Selys, 1891, *Ann. Mus. Civ. Genova* **30** : 457. Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 255.

Material examined : Mizoram : Aizawl (281b) 1♂, 24.x.1991.

Distribution : *Present record* : Mizoram. *Past record* : INDIA : Nil.

Elsewhere : ASIA : Burma, Malayasia, Thailand, Vietnam (Tsuda 1991).

Remark : A new record from India (Mitra 1994)

Genus *Lathrecista* Kirby

Lathrecista Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 264; Ris, *Cat. Coll. Selys*, Fasc. **9** : 20, 128, 129; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 280; Lieftinck, 1954, *Treubia* 22 (suppl.) 132; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 45.

Type-species : *Libellula asiatica* Fabricius

Distribution : Ethiopean, Oriental, Palearctic and Australasia.

Lathrecista asiatica asiatica (Fabricius) (Fig. 151)

Libellula asiatica Fabricius, 1798, *Ent. Syst. suppl.* p. 283.

Lathrecista asiatica, Karsch, 1890, *Berlin Ent. Zeit.* 33 : 369.

Lathrecista asiatica asiatica, Ris, 1909, *Cat. Coll. Selys* fasc. pp. 129-132; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 281-284; Lieftinck, 1954, *Treubia* **22** (suppl.) : 132, Tsuda, 1991, *A distributional list of World Odonata. 1991* p. 157.

Material examined : Arunachal Pradesh : Slang (221) 1♀, 4.x.1966; Assam : Barpeta (3) 1♂, 6.iv.1986; 1♂, 8.iv.1986; Durgapur (98) 1♀, 14.v.1979; Goalpara (235) 2♂, 8.vi.1973; 1♂, 9.vi.1973; 1♂, 11.vi.1973; 1♂, 2♀, 12.vi.1973; 2♂, 13.vi.1973; (118) 1♂, 18.vi.1973; (145) 1♀, 19.vi.1973; Bihar : Hazaribagh (126) 1♂, 30.x.1974; 3♀, 2.xi.1974; Palamau (222) 1♂, 1♀, 20.vi.1983; Singhbhum (24) 1♂, 3♀, 4.xii.1974; 1♂, 8.xii.1974; Manipur : Mao (196) 5♀, 16.ix.1975; Nagaland : Kohima 1♂, 1♀, 14.ix.1994; Orissa : Bolangir (38b) 1♂, 8.xi.1973; Sambalpur : (252) 1♀, 22.x.1973; 1♂, 23.x.1973; West Bengal : Bankura (65) 1♂, 31.vii.1974; (21) 1♂, 1♀, 1.viii.1974; (277) 1♂, 2.viii.1974; (38a) 2♂, 2♀, 4.viii.1974; Birbhum (236) 1♂, 11.ix.1974; (255) 1♂, 5.x.1974; (236) 3♀, 8.x.1974; (39 & 260) 5♂, 9♀, 9.x.1974; Calcutta (52) 1♂, 2.viii.1967; 2♀, 3.ix.1966; 24 Parganas (124) 2♂, 4♀, 18.viii.1973; 1♂, 2♀, 17.viii. 1973; 1♀, 21.viii.1973; 1♀, 22.viii.1973; 3♂, 3♀, 26.viii.1973; Jalpaiguri (49) : 4♂, 24.xii.1984.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Nagaland, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Sibsagar (Bhasin 1953); Calcutta (Mitra 1983); Howrah (Dasgupta 1957); Barkuda Island (Fraser & Dover 1922). *Central India* : Bastar (Prasad 1996a). *Southern India* : Coorg, Khandala, Nilgiris, Palni (Fraser 1924b); Deccan, Malabar (Fraser 1931a); *Western India* : Bombay, Poona (Fraser 1918b); Anadamans (Lahiri 1998).

Elsewhere : ASIA : Bhamo (Selys 1891); Ceram, Celebes, Ceylon, Indo-China; Linda, Mindanao, New Guinea, Philippines, Luzon (Ris 1909b); Samoa, Sundaic Archipelago (Fraser 1936a). Taiwan (Lieftinck *et. al.* 1984).

Remark : New record from the states of Arunachal Pradesh, Bihar, Manipur and Orissa (Mitra 1994).

Intraspecific variations : The male specimens from Andaman Island vary from the specimens under study in having metallic blue vescicle and brown thorax. The specimens from Assam, Orissa and West Bengal vary from specimens from Arunachal Pradesh and Manipur in having labium ochreous, major portion of the lateral lobes black, face and lower broder of frons bluish yellow, anterior lobe of prothorax yellow at the middle.

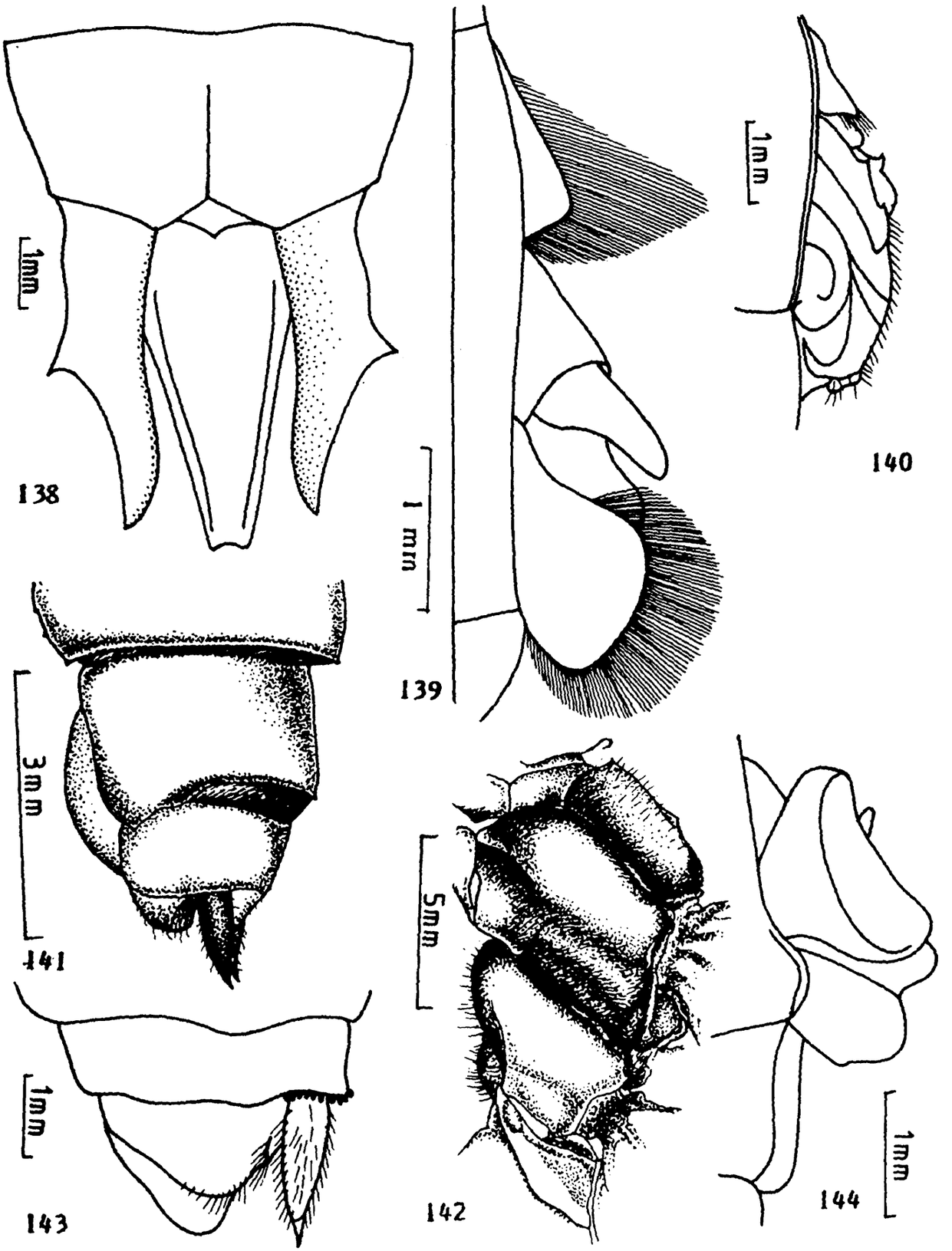


Fig. 138-144. 138. Anal appendages of *Macromia m. moorei* Selys (Dorsal view); 139. Genitalia of male *Urothemis s. signata* (Rambur) (Right lateral view); 140. Genitalia of male *Cratilla l. lineata* (Brauer) (Right lateral view); 141. Anal appendages and genitalia of female *Lyriothemis bivittata* (Rambur) (Left lateral view); 143. Genitalia and anal lateral view); 142. Markings on thorax of same (Left lateral view); 144. Genitalia of *Hylaeothemis fruhstorferi apicalis* Fraser (Right lateral view)

Genus *Cratilla* Kirby

Cratilla Kirby, 1900, *Ann. Mag. Nat. Hist.* (7) **5** : 542; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 284; Lieftinck, 1954, *Treubia* **22** (suppl.) : 133; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 44.

Type-species : *Orthemis metallica* Brauer

Distribution : India, Srilanka, Burma, Malayasia, Sundaic Archipelago, Borneo, New Guinea, Philippines, Malacca.

Cratilla lineata lineata (Brauer) (Figs. 140, 193)

Orthemis lineata Brauer, 1868, *Sitzb. Akad. Wiss. Wien* **77** : 9.

Cratill lineata Förster, 1903, *Ann. Mus. Hunger* p. 537; Fraser 1936, *Fauna Brit. India Odon.* **3** : 286-288.

Cratilla lineata lineata Lieftinck, 1954, *Treubia* 22 (suppl.) : 134.

Material examined : Arunachal Pradesh : Chandan Forest (60) 1♂, 24.iii.1973. Orissa : Ganjam (104) 1♀, 13.iii.1974. Jharpara (137) 1♀, 30.x.1972; West Bengal : Darjeeling 1♂, 4.viii.1978.

Distribution : *Present records* : Arunachal Pradesh, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Bengal (Duars & Darjeeling) (Fraser 1936a); *Northern India* : Dehra Dun (Singh & Prasad 1974); Garhwal Hills (Prasad 1974). *Southern India* : Malabar (Ris 1909b); Andamans (South & Middle) (Hämäläinen *et. al.* 1999).

Elsewhere : ASIA : Formosa (Needham 1930); Java (Ris 1909b; Selys 1891) Malacca, Mindanao (Ris 1909b) Malayasia (Fraser 1936a) New Guinea, Perak (Ris 1909b); Palon, Philippines, Sumatra (Selys 1891) Burma, China, Indonesia, Kampuchea, Malayasia, Nepal, Singapore, Thailand (Tsuda 1991).

Remark : An addition to the odonate fauna of Arunachal Pradesh and Orissa. Tsuda (1991), Ram & Prasad (1999) reported it as *C. l. calverti* Förster, Fraser (1936a) revised his opinion of (1924b). Hence Fraser (1936a) has been followed here.

Genus *Potamarcha* Karsch

Potamarcha Karsch, 1890, *Berlin Ent. Zeit.* **33** : 370; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 288; Lieftinck, 1954, *Treubia* **22** (suppl.) : 133 : Davies, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species : *Libellula obscura* Rambur

Distribution : India, Nepal, Bangladesh, Srilanka, Burma, Thailand, Malayasia, Indonesia, New Guinea, Taiwan, Philippines, Australia.

Potamarcha congener (Rambur) (Figs. 145, 146, 184)

*Libellula obscura** Rambur, 1842, *Ins. Nevro.* p. 64; (*name preocc.)

Libellula congener Rambur, 1842, *Ins. Nevrop.* p. 70.

Potamarcha obscura Karsch, 1890, *Berlin Ent. Zeit.* **33** : 371; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 289-291; Lieftinck, 1954, *Treubia* **22** (suppl.) : 133.

Potamarcha congener congener, Lieftinck *et. al.* 1984, *Catalogue Tiwanese dragonflies* p. 45.

Material examined : Arunachal Pradesh : (294) 1♂, 13.v.1966. Assam : Nissangaon (217) 1♂, 12.v.1979; Nagaland : Zunhebeto, 3♂, 6♀, 25.vii.1991 (Deposited in ERS, ZSI, Shillong); Orissa Anugul (7) 2♀, 29.ix.1992; 1♂, 1♀, 1.x.1972 Bangriposi (19a) 1♂, 1♀, 15.ix.1972; Barsham (27) 1♂, 13.ix.1972; Chandanpur (62) 1♂, 4♀, 16.ix.1972; Dhenkanal (88) 1♀, 6.x.1972; Jharansai (138) 1♀, 17.ix.1972; Keonjhargarh (159a) 1♂, 1♀, 4.ix.1972; 1♀, 19.ix.1972; Mayurbhanj (194) 1♀, 6.vii.1973; Puri (233) 1♂, 2.i.1974; Sundergarh (275) 1♂, 19.ix.1972; 1♂, 23.ix.1972; Tripura : Agartala (232) 1♀, 29.x.1974; Belonia (20) 1♀, 2.x.1977; (215) 1♀, 3.x.1977; Manu (184) 1♀, 23.xi.1974; Teliamura (115) 3♀, 11.xi.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Nagaland, Orissa, Tripura. *Past records* : INDIA : *Eastern India* : Calcutta (Ram *et. al.* 1982) Chilka Lake (Laidlaw 1915d); Barkuda Island (Fraser & Dover 1922); Darjeeling (St. Quentin 1936); Manipur (Lahiri 1977b); Balasore (Dasgupta 1957); Buxa

Nagaland, Singhbhum (Bhasin 1953); Meghalaya (Lahiri 1987) *Northern India* : Banki Gorakhpur (Bhasin 1953); *Southern India* : Nilgiris, Poona, Khandala, Coorg (Fraser 1924b); Tamil Nadu (Kumar 1990), Annaimalai, Cochin, Deccan, Kanara, Malabar (Fraser 1931a). *Western India* : West coast of India (Fraser 1936a); Goa (Prasad 1995); Maharashtra (Kalaskar & Kalaskar 1998). *Central India* : Chhindwara (Mitra 1988). Bastar (Prasad 1996a); Andamans (Lahiri 1998).

Elsewhere : ASIA : Bangladesh, Burma, China, Hongkong, Indonesia, Kampuchea, Laos, Sri Lanka, Malayasia, Nepal, Philippines, Thailand, Taiwan, Vietnam, Australia (Tsuda 1991).

Remark : This is a new record from Arunachal Pradesh Assam, and Orissa (Mitra 1994).

Intraspecific variations : The female specimens vary from the female specimen from Madhya Pradesh in having thorax brown on dorsum, legs dark brown, yellow stripe on femora inconspicuous, the male specimens vary from Fraser's (1936a) description in having labium bluish yellow, labrum olivacious; occiput, pterostigma and anal appendages dark brown. Male specimens from the Andaman Islands agree with the specimens under study.

Genus ***Orthetrum*** Newman

Orthetrum Newman, 1833, *Ent. Mag.* **1** : 511; Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 261; 1890, *Syn. Cat. Neur. Odon.* p. 35; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 291; Lieftinck, 1954, *Treubia* **22** (suppl.) : 135; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species : *Libellula coerulescens* Fabricius

Distribution : Old world and Pacific Islands.

Key to species of genus *Orthetrum* Newman

1. Antenodals in forewing 11-12 3
- Antenodals in forewing 14-16 2
- Antenodals in forewing 17-18 .... *triangulare triangulare* (Selys)
2. Thorax greenish yellow, abdomen swollen at base and then abruptly slimmed .... *sabina sabina* (Drury)
- Thorax reddish-brown; male with pruinescens .... *pruinosum neglectum* (Rambur)
- Thorax pale or olivaceous green .... *luzonicum* (Brauer)
3. Only one row of cells between IR_3 and R_{spl} ..... *anceps* (Schneider)
- More than one row of cell between IR_3 and R_{spl} 4
4. Costal border of wings and antenodals yellow ..... *cancellatum cancellatum* (Linné)
- Costal border of wings and antenodals black 5
5. Pterostigma dark reddish brown .... *testaceum testaceum* Burmeister
- Pterostigma brown .... *japonicum internum* McLachlan
- Pterostigma sandy-yellow ..... sp. indet
- Pterostigma ochreous 6
6. Abdomen 22-25 mm .... *taeniolatum* (Schneider)
- Abdomen 28-36 mm 7
7. Membrane black ..... *glacum* (Brauer)
- Membrane white .... *bruenneum brunneum* (Fonscolombe)

Orthetrum brunneum brummeum (Fonscolombe)

Libellula brunnae Fonscolombe, 1837, *Ann. Soc. Ent. France* **6** : 141.

Orthetrum brunneum Selys, 1872, *Ann. Soc. Ent. Belg.* **15** : 27.

Orthetrum brunneum brunneum Fraser, 1936, *Fauna Brit. India. Odon* **3** : 294-295.

Material examined : Arunachal Pradesh : Siang (221) 1♀, 11.x.1966, Subansiri (165)

1♀, 9.v.1966; (85) 9♂, 2♀, 10.v.1966; (294) 2♀, 13.v.1966; 4♀, 14.v.1966; (123) 3♀, 15.v.1966. Manipur : New Chura Chandpur (216) 1♂, 21.ix.1975; Ukhrul (290a) 1♂, 3.x.1975. Tripura : Agartala (232) 1♂, 29.x.1974; Ambassa (152) 1♂, 20.xi.1974.

Distribution : *Present records* : Arunachal Pradesh, Manipur, Tripura. *Past records* : INDIA : *Eastern India* : Assam (Fraser 1918b); Singhbhum (Bhasin 1953); *Northern India* : Kashmir (Calvert 1898; Fraser 1918; Mani *et. al.* 1955); Almora, Tarakhet (Bhasin 1953). Garhwal Hills (Prasad 1974); Doon valley (Singh & Prasad 1976b).

Elsewhere : ASIA : Quetta (Fraser 1918b) Asia Minor (Fraser 1936a); Afghanistan (Dumont 1975); Burma (Bhasin 1953); AFRICA : Algeria, Egypt, (Tsuda 1991). EUROPE : Belgium, Bavaria, Germany (Korman 1966) : Constantinopol, Holland, Italy, Madrid, Portugal, Samarkhand, Sicily, Taskhent (Ris 1909b); Polland (Mielewczyk 1979); Albania, Austria, Belgium, Burgaria, Switzerland, Czechoslovakia, Cyprus, Germany (Tsuda 1991).

Remark : A new record from Arunachal Pradesh, Manipur and Tripura (Mitra 1994).

Intraspecific variations : The specimens vary from Fraser's (1936a) description in having labium, labrum and face rust red; occiput brown and legs blackish brown.

Orthetrum sp. indet.
(Fig. 187)

Material examined : Bihar : Palamau (222) 1♀, 16.xi.1974.

Abdomen 21 mm Hindwing 24 mm

Head : Labium, labrum, face and frons olivaceous - white with a brownish tinge on temple of frons. Eyes brown.

Prothorax sandy yellow. *Thorax* olivaceous brown, black antehumeral stripe, sutures finely black. Legs yellow, flexer surface of femora and tibiae black. *Wings* : hyaline, pterostigma sandy-yellow, bounded by black nervures, nodal index $\frac{8\text{-}11}{9\text{-}8}/\frac{11\text{-}9}{8\text{-}9}$; arc lies between the first and second antenodals. *Abdomen* : Brown with black middorsal carina, slightly tumid at base and then gradually narrows.

Remark : The specimen resembles *Orthetrum brunneum* (Fonscolombe) and *Orthetrum anceps* (Schneider) but differs in size, marking on labrum, prothorax and thorax.

Orthetrum anceps (Schneider)
(Fig. 186)

Libellula anceps Schneider, 1845, *Stett. Ent. Zeit.* **6** : 111.

Orthetrum anceps Ris, 1909, *Cat. Coll. Selys fasc.* **9** : 177, 185-187. Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 295-296, Tsuda, 1991, *A dist. list World Odonata 1991* p. 169.

Material examined : Arunachal Pradesh : Siang 1♂, 2.x.1966; 1♂, 6.x.1966; (197) 1♂, 8.x.1966; 1♂, 12.x.1966; 3♂, 24.x.1966; Mizoram (57b) 1♂, 29.x.1991; Sikkim : Chulung (72) 1♀, 20.x.1977; West Bengal : Darjeeling (245) 1♂, 7.iv.1973; (266) 1♂, 2.i.1976.

Distribution : *Present records* : Arunachal Pradesh, Mizoram, Sikkim and West Bengal. *Past records* : INDIA : *Western India* : Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Asia Minor, Beirut, Morocco, Quetta, Syria (Fraser 1936a); AFRICA : Algeria, Egypt (Ris 1909b) EUROPE (Fraser 1918b); Rumania, Sicily (Ris 1909b).

Remark : An addition to the fauna of the Oriental region (Mitra 1994)

Intraspecific variation : The specimens vary from Fraser's (1936a) description in having labium and labrum ochreous, postclypeus and frons grey, postnodals in both fore-and hindwings are 8-9.

Orthetrum taeniolatum (Schneider)
(Fig. 149)

Libellula taeniolatum Schneider, 1845, *Stett. Ent. Zeit.* **6** : 111.

Libellula taeniolata Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 732

Orthetrum taeniolatum Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 37; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 296-298.

Material examined : Arunachal Pradesh : Rupa camp. 1♂, 20.12.1966; Bihar : Palamau (191) 3♂, 1♀, 16.xi.1974; Nagaland : Kohima 1♂, 21.iii.1997; Sikkim : Lachung (174) 1♂, 20.viii.1979; Nayabazar (213) 1♀, 29.x.1977; Rabangla (234) 1♀, 6.x.1988; Tumin (287a) 1♂, 30.ix.1988; 1♂, 1.x.1988; West Bengal : Bankura (139) 1♀, 3.viii.1974.

Distribution : *Present records* : Arunachal Pradesh, Bihar, Sikkim and West Bengal, Nagaland. *Past records* : INDIA : *Eastern India* : East India (Ris 1909b); Arunachal Pradesh (Ram & Prasad 1999); *Northern India* : Uttar Pradesh (Kumar 1982); Dehra Dun, Mothronwalla, Nalapani, Mussorie, Kempti falls, Saharanpur, Ranipur, (Bhasin 1953); Muree, Kashmir (below 5000') (Ris 1909b); Kangra (Prasad 1976); Rajasthan (Prasad & Thakur 1981). *Southern India* : Annaimalai, Bolovumpattis, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palni Hills, Travancore (Fraser 1931a); Campbellpore (Schneider 1985c); *Central India* : Deesa, Jabbalpore (Ris 1909b); Bastar (Prasad 1996a). *Western India* : Poona (Fraser 1924b); Maharashtra (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1984).

Elsewhere : ASIA : Burma (Fraser 1918b). Baluchistan (Fraser 1919b) Ceylon (Fraser 1918b); Dobar Goolis Mts. (Kimmins 1968); Iran (Blom 1982) Nepal (Kiauta 1974). Europe : Greece (Schneider 1985c). Turkey (Schneider 1985c); Somali (Carfi 1974).

Remark : Demirsoy (1982) placed the species in synonymy with *Orthetrum chrysostigma* which has been considered wrong by Schneider (1985c).

Intraspecific variation : The specimens from Sikkim agree with Fraser's (1936a) description; the specimen from West Bengal is a teneral one.

Orthetrum luzonicum (Brauer) (Fig. 148)

Libellula luzonica Brauer, 1868, *Verh. zool.-bot. Ges. Wien* 18; 169, 732 Lieftinck, 1954, *Treubia* **22** (suppl.) : 136.

Orthetrum chrysostigma luzonicum Ris, 1909, *Cat. Coll. Selys* fasc. **9** : 203; 210-212; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 298-300.

Material examined : Arunachal Pradesh : 2♂, Subansiri, 9.5.1966; 1♂, Hapoli, 15.v.1966; Assam : Barpeta (92) 1♀, 10.iv.1986; Orissa : Bolangir (38b) 1♂, 1♀, 8.xi.1973; Kotagarh (171) 1♀, 24.v.1972; West Bengal : Darjeeling (35a) 1♂, 1♀, 19.v.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Orissa, and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1936a); Lakhimpur, Nagaland, (Bhasin 1953); Sibsagar, Khasia Hills (Ris 1909b); Arunachal Pradesh (Ram & Prasad 1999). *Northern India* : Uttar Pradesh (Kumar 1982); Chakrata (Bhasin 1953); Kulu, Manali (Singh *et. al.* 1955); Kangra (Prasad 1976). *Central India* : Bastar (Prasad 1996a). *Southern India* : Annaimalai, Coorg, Deccan, Malabar, Nilgiris, Palni Travancore (Fraser 1931a); Nilambur, Nedungayam (Bhasin 1953); Coimbatore (Fraser 1936a); *Western India* : Deesa (Ris 1909b).

Elsewhere : ASIA : Burma (Fraser 1918b, 1936a); Tennasserim (Lieftinck 1948); Tonkin (Ris 1909); Ceylon (Ris 1909b; Fraser 1936a); Philippines, Luzon, Malayasia (Ris 1909b); Nepal (St. Quentin 1970); Sumatra, Sumba (Ris 1909b); Afghanistan, Bangladesh, China, Hongkong, Indonesia, Japan, Malayasia, Nepal, Thailand, Taiwan, Vietnam (Tsuda 1991).

Remark : A new record from Orissa (Mitra 1994).

Orthetrum sabina sabina (Drury) (Figs. 157, 196)

Libellula sabina Drury, 1770, *111. Exot. Ins.* 1 : 114;

Orthetrum sabina Kirby, 1889, *Trans. zool. Soc. Lond.* **12** : 302; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 300-302.

Orthetrum sabina sabina Lieftinck, 1954, *Treubia* **22** (suppl.) : 137.

Material examined : Arunachal Pradesh : Siang (146) 1♂, 4.x.1966; (176) 1♂, 6.x.1966; (76) 1♂, 12.x.1966; Assam : Barpeta (146) 3♂, 1♀, 2.iv.1986; Bijani (36) 1♀, 30.x.1974; (238) 1♂, 27.v.1979 Cachar (51) 1♀, 5.xii.1983; Dhubri (89) 1♀, 12.xi.1974; Durgapur (98) 1♂, 1♀, 29.v.1979; Goalpara (235) 2♀, 12.vi.1973; 1♂, 17.vi.1973; Kaziranga (156) 2♀, 12.vi.1973; 3♀, 5.xi.1974; Lohaband (178) 1♂, 30.x.1975; Mikir Hills (200) 2♂, 1♀, 3.xi.1974; Nowgong (219) 2♀, 1♂, 4.xi.1974. Silchar (238) 3♂, 27.v.1979; Bihar : Hazaribagh (126) 1♀, 30.x.1974; 1♀, 2.xi.1974; Singhbhum (24) 1♀, 8.xii.1974; Manipur : Bishenpur (38) 2♀, 22.xi.1983; Churachandpur (73a) 3♂, 1♀, 20.xi.1983; Imphal (130) 1♂, 6.x.1975; Lamka (175) 2♂, 2♀, 21.xi.1983; Mao (270) 1♂, 13.xi.1975; Moirang (202) 1♀, 13.xi.1983; Morch (204) 1♂, 24.xi.1983; (46) 1♂, 19.x.1975; Mizoram : Champhai (57b) 3♂, 30.x.1991; Nagaland Kohima (169) 1♂, 14.x.1984; Orissa : Anugul (7) 1♂, 22.ix.1972, 1♀, 27.ix.1972. 1♀, 29.ix.1972; 1♂, 3♀, 1.x.1972; 1♂, 8.xii.1972, Bangriposi (19a) 4♀, 14.ix.1972; 1♀, 15.ix.1972; Bolangir (38b), 1♂, 1.x.1972; 1♂, 16.ix.1972; Chandpur (62) 1♂, 16.ix.1972; 1♂, 1♀, 27.xi.1971; Dhenkanal (88) 1♂, 7.ix.1972; 1♂, 25.x.1972; Gopalpur (117) 1♀, 22.xi.1973; Kalahandi (147) 1♀, 7.xii.1973; Keonjhargarh (159a) 1♀, 16.ix.1972; 1♀, 20.ix.1972; 1♀, 26.ix.1972; 1♀, 27.ix.1972; 1♀, 30.ix.1972; 1♂, 31.iii.1973; Koraput (168) 1♀, 2.xii.1973; Mayurbhanj (26a) 1♂, 1♀, 27.i.1986; Puri (233) 1♀, 17.vii.1973; 1♀, 5.i.1974; 1♂, 13.i1974; Sambalpur (252) 1♂, 23.x.1973; Sundergarh (275) 1♂, 1♀,24.iii.1973; Tripura : Agartala (2) 1♂, 2♀, 9.xi.1969; (57a) 1♂, 1♀, 15.xi.1969; 1♀, 16.xi.1969; 1♂, 3♀, 6.xi.1970; (31) 3♂, 3.x.1974; (232) 2♂, 29.x.1974; (135) 2♂, 2♀, 30.x.1974; (31) 9♂, 5♀, 31.x.1974; (2) 1♂, 1♀, 1.xi.1974; (33) 8♂, 4♀, 2.xi.1974; 1♂, 20.xi.1974; 7♂, 2♀, 29.x.1975; 3♀, 10.xii.1983; Ambassa (4) 2♂, 2.xi.1974; 1♂, 16.xi.1974; (93) 1♂, 18.xi.1974; (152) 1♂, 1♀, 20.xi.1974; 1♂, 26.xi.1974; Belonia (28a) 1♀, 1.x.1974; (148) 1♂, 3♀, 2.x.1977; (215) 1♂, 2♀, 3.x.1977; 3♀, 28.x.1977; Chandrapur (63) 1♂, 1♀, 7.x.1977; Maichera (183) 4♂, 5♀, 27.ix.1977; Manu (184) 1♂, 1♀, 23.xi.1974; (83) 3♂, 1♀, 24.xi.1974 (133) 1♂, 3♀, 25.xi.1974; Sripur (272) 1♂, 30.ix.1972; South Tripura (13) 1♂, 6.x.1977; (262) 1♂, 30.xi.1974; Teliamura (115) 4♂, 1♀, 11.xi.1974; (114a) 1♂, 6♀, 12.xi.1974; (170) 8♂, 11♀, 13.xi.1974; (160) 2♀, 22.xi.1974; 1♂, 19.x.1977; Udaipur (289a) 1♂, 27.xi.1969; 1♂, 1♀, 28.xi.1969; (105) 3♂, 6♀, 5.xi.1974; (273a) 5♂, 2♀, 6.xi.1974; (106) 2♂, 7♀, 7.xi.1974; (106) 3♂, 4♀, 8.xi.1974; 2♂, 3♀, 4.xi.1977; West Bengal : Bankura (21) 2♂, 31.vii.1974; Birbhum (236) 1♂, 11.ix.1974; 1♀, 11.ix.1974; 1♀, 8.x.1974; 1♀, 6.x.1974; (185) 1♂, 7.x.1974; (39 & 260) 6♀, 9.x.1974; 1♂, 2.ix.1974; Calcutta 1♂, 8.x.1966; 1♂, 20.xi.1966; 1♀, 7.iv.1967; Darjeeling 1♂, 23.xii.1973; Howrah 1♀, 6.viii.1974; Jalpaiguri (248) 1♂, 9.ix.1975; 1♂, 1♀, 10.ix.1975; 1♂, 1♀, 12.ix.1975; (49) : 1♀, 24.xii.1984. Kochbehar (166) 1♀, 14.ix.1975; 1♀, 31.viii.1983; 24 Parganas (209a) 1♀, 14.viii.1966; 1♀, 18.viii.1973; 1♂, 20.viii.1973; 1♀, 23.viii.1973; 1♂, 20.ix.1973; 1♂, 7.ix.1974; 1♂, 5.ix.1983; (119a) 1♂, 11.ix.1983; (293a) 1♀, 16.ix.1983.

Distribution : *Present records* : Arunachal Pradesh, Assam; Bihar, Manipur, Mizoram, Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Abor Hills (Laidlaw 1914); Arunachal Pradesh, Assam (Lahiri 1979); Calcutta (Mitra 1983); Barkuda Island (Fraser & Dover 1922); Buxa, Pusa, Sibsagar (Bhasin 1953) : Manipur (Lahiri 1977b); Meghalaya (Lahiri 1987); Tripura (Lahiri 1977a, Mitra & Sen 1975); Dhanbad (Prasad & Kumar 1977); *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Naini Tal (Sahni 1964); Gorakhpur, Ramgarh, Sahadra (Bhasin 1953) : Rajasthan (Bose & Mitra 1976); Kangra (Prasad 1976); Doon Valley (Singh & Prasad 1976b); *Southern India* : Annaimalai,

Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palni Hills (Fraser 1931a); Silent Valley (Rao & Lahiri 1983); Tamil Nadu (Kumar & Khatri 1985); Andra Pradesh (Joseph & Satyarani 1988). Great Nicobar Island (Mitra 1995a). *Western India* : Bombay (Fraser 1924b); Goa (Prasad 1995); Maharashtra (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1984). *Central India* : Gwalior (Baijal & Agarwal 1955); Nagpur (Mitra 1988); Bastar (Prasad 1996a); Andaman Island (Fraser 1924a).

Elsewhere : ASIA : Asia Minor (Fraser 1924a); Burma (Lieftinck 1948) Bhamo (Selys 1891); Bangladesh, Chittagong (Chowdhury & Akhteruzaman 1981); China (Klots 1947; Needham 1930, Ris 1909b) Ceylon (Fraser 1918b); Cyprus (Selys 1891); Formosa, Indo-China, Java Mindanao (Ris 1909b); Mesopotamia (Fraser 1924a); Philippines (Fraser 1924a; Kiauta & Kiauta 1983a). Nepal (Asahina 1955; Kiauta 1975; St. Quentin 1970); Iran (Blom 1982); Syria (Selys 1891); Singapore (Kiauta & Kiauta 1982b, Ris 1909b) Sumatra (Ris 1909b); Thailand (Titayavan 1979); Yunnan (Moore 1878); AFRICA : Tropical Africa (Selys 1891); North Africa (Fraser 1924a); Somaliland (Carfi 1974). AUSTRALIA : Queensland, New Guinea, Sidney (Ris 1909b); Polynesia (Selys 1891). Celebes, Ceram (Ris 1909b); Micronesia (Lieftinck 1962).

Remark : New record from Nagaland (Mitra 1994).

Intraspecific variations : The specimens are lighter in colour than specimens from Nicobar Islands; the specimens vary from Fraser's (1936a) description in having labium, labrum brown; face and frons olivaceous; antenodals in forewing 12-13; in hindwing 9-11; postnodals in forewing 8-12; in hindwing 8-12.

Orthetrum cancellatum cancellatum (Linnaeus)

Libellula cancellata Linnaeus, 1758, *Syst. Nat.* ed. 10; Vol. **1** : 554.

Orthetrum cancellatum Meyer - Dur, 1874, *Mitt. Schwiez. Ent. Ges.* **4** : 330.

Orthetrum cancellatum cancellatum, Ris, 1909, *Cat. Coll. Selys.* fasc. **9** : 180; 229-231; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 302-307.

Material examined : Arunachal Pradesh : Kameng (231) 1♀, 4.v.1966; Subansiri (165) 2♀, 9.v.1966; (85) 1♀, 10.v.1966; (294) 5♂, 13.v.1966; 7♂, 2♀, 14.v.1966; (123) 3♂, 15.v.1966; (28) 1♀, 27.x.1966; (80) 1♀, 28.x.1966; Sikkim : Lachung (174) 1♂, 2.viii.1979.

Distribution : *Present records* : Arunachal Pradesh and Sikkim. *Past records* : INDIA : *Northern India* : Kashmir (Fraser 1918b; Calvert 1898); Kulu (Singh *et. al.* 1955); Pathankot (Dasgupta 1957); *Central India* : Gwalior (Baijal & Agarwal 1955)

Elsewhere : ASIA : Asia Minor (Fraser 1936a); AFRICA : N. Africa (Fraser 1936a); EUROPE : England (Fraser 1918b); Algeria, Rumania, Denmark, Sicile (Ris 1909b); Germany (Benken 1980; Korman 1966); British Isle (Fraser 1936a). Austria, Belgium, Burgaria, Switzerland, Czechoslovakia, Germany, Spain, Finland, France, Greece, Ireland (Tsuda 1991).

Remark : An addition to the fauna of the eastern India (Mitra 1994).

Intraspecific variation : Specimens do not vary from specimens of Madhya Pradesh (2♂, 1♀) but differ from Fraser's (1936a) description in having antenodal in forewings 12-14; hindwing 8-10; postnodals in forewing 10-11; in hindwing 12.

Orthetrum japonicum internum MacLachlan (Fig. 152)

Orthetrum japonicum internum MacLachlan, 1894, *Ann. Mag. Nat. Hist.* (6) **13** : 431; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 304-305.

Material examined : Assam : Goalpara (217) 1♀, 26.v.1973; (132) 1♀, 4.vi.1973 (235) 1♀, 10.vi.1973; 11♂, 2♀, 12.vi.1973; 1♀, 13.vi.1973; 1♂, 14.vi.1973.

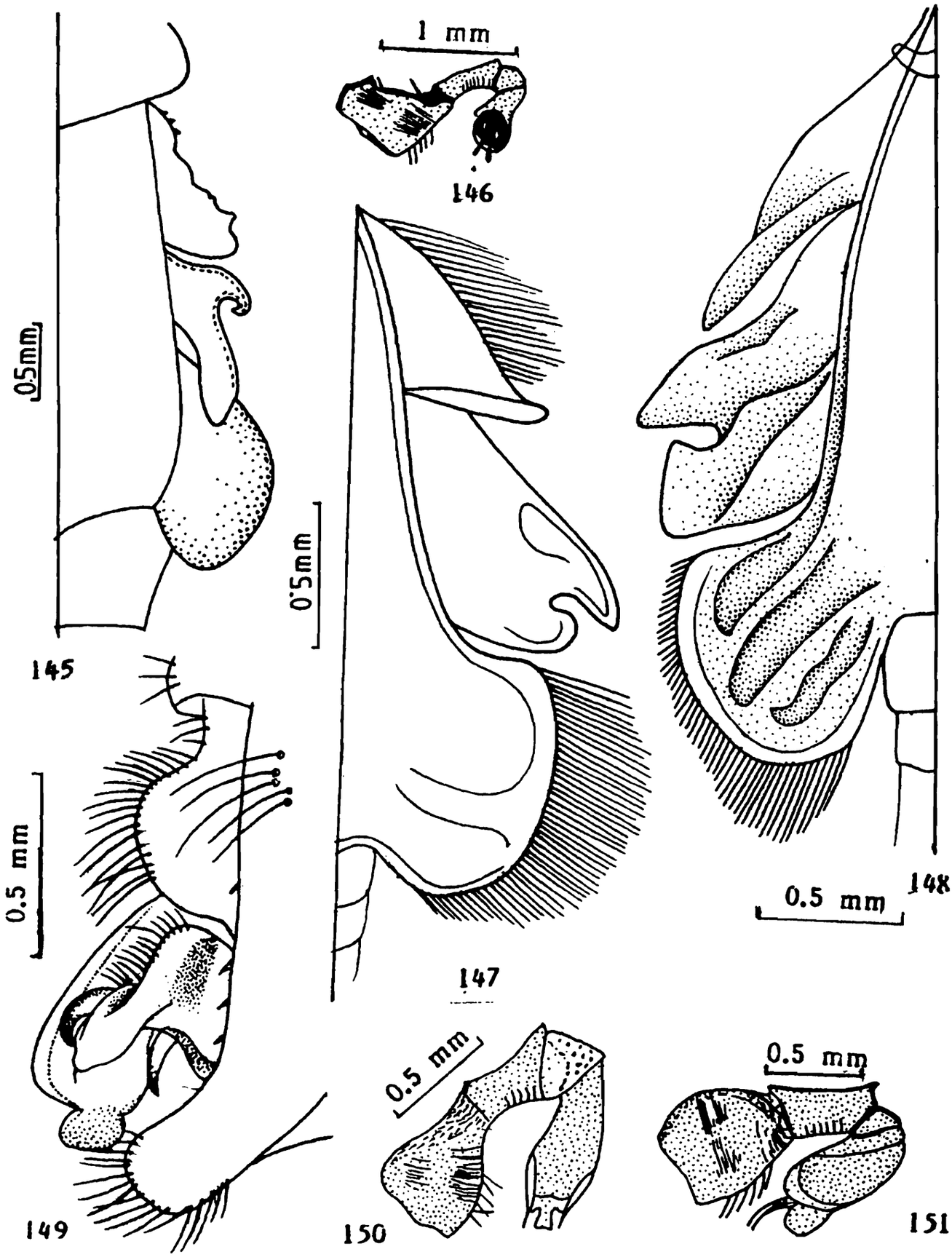


Fig. 145-151. 145. Genitalia of *Potamarcha congener* (Rambur); 146. Penis of the same; 147. Genitalia of *Orthetrum pruinosum neglectum* (Rambur); 148. Same of *O. luzonicum* (Brauer); 149. Same of *O. taeniolatum* (Schneider); 150. Penis of *Bradinopyga geminata* (Rambur); 151. Penis of *Lathrecista a. asiatica* (Fabr.)

Distribution : *Present record* : Assam. *Past records* : INDIA : *Eastern India* : Kurseong, Khasi Hills (Fraser 1918b; Ris 1909b); Nagaland, Shillong (Bhasin 1953); Arunachal Pradesh (Prasad 1997b). *Northern India* : Kashmir (Fraser 1918b; Mani *et. al.* 1955, Ris 1909b); Kulu (Singh *et. al.* 1955); Kangra (Prasad 1976).

Elsewhere : ASIA : Bangladesh, Sylhet (Bhasin 1953); Burma, Tonkin (Ris 1909b); China, Szechuen (MacLachlan 1896, Ris 1909b); Nepal (Kiauta 1975, St. Quentin 1970); Tibet, Yatung (Ris 1909b); Ta-Chien Lu (Kimmins 1968). China (Chao 1981), Japan, Nepal, Pakistan, Thailand, Taiwan, Vietnam, Korea (Tsuda 1991).

Remark : A new record from Assam.

Intraspecific variations : The specimens vary from Fraser's (1936a) description due to possession of antenodals in forewing 13-14; hindwing 8-11; postonodals in forewing 12-13; hindwing 10-12; the female specimens have thorax golden brown, abdomen ochreous, two-thirds of the ventrolateral side of the segments 4-7 black; anal appendages with black tip.

Orthetrum triangulare triangulare (Selys) (Fig. 154)

Libellula triangularis Selys, 1878, *Mitt. Mus. Dresden* p. 314.

Orthetrum triangulare, Kirby, 1886, *Proc. Zool. Soc. Lond.* p. 327

Orthetrum triangulare triangulare, Ris, 1909, *Cat. Coll. Selys* fasc. **9** : 181; 243-244; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 305-307; Lieftinck, 1954, *Treubia* **22** (suppl.) : 139.

Material examined : Arunachal Pradesh : Namdhapa (211a) 2♂, 2.v.1981; Subansiri (223) 1♂, 17.v.1966; Manipur : Mao (196) 1♂, 16.ix.1975; New Churachandpur (46) 2♂, 19.ix.1975; Mizoram : Phaileng (228a) 1♂, 23.x.1991; Nagaland : Zunheboto 4♂, 8.vi.1991, (Deposited in ERS, ZSI, Shillong); Sikkim : Geyzing (110) 1♂, 6.xi.1977; Nayabazar (213) 2♂, 30.x.1977; Phensong (229) 1♂, 19.x.1977; Rangdom (242) 5♂, 19.x.1977; West Bengal : Darjeeling (81) 1♂, 20.viii.1978.

Distribution : *Present records* : Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim and West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh, Assam (Lahiri 1979); Darjeeling, Sikkim, Khasi Hills (Ris 1909b); Sibsagar, Buxa (Bhasin 1953). *Northern India* : Muree, Kashmir (Fraser 1918b; Mani *et. al.* 1955); Chakrata (8000') (Singh & Baijal 1954) : Uttar Pradesh (Kumar 1982); Almora, Arakot, Bhatronj, Chakrata, Dehra Dun, Kemptifalls Nalapani, Saiya (Bhasin 1953); *Southern India* : Conoor, Coorg, Nilgiris, Ooty (Fraser 1924b); Anaimalai, Bolovumpattis, Deccan, Kanara, Malabar, Palni Hills, Travancore (Fraser 1931a); Tamil Nadu (Kumar 1990).

Elsewhere : ASIA : Burma (Fraser 1918b, Laidlaw 1914); (Ris 1909b) Leito (Selys 1891); Tennasserim (Lieftinck 1948); Ceylon (Ris 1909b, Fraser 1918b). Nepal (Kiauta 1974), Afghanistan, China, Laos, Thailand, Vietnam (Tsuda 1991).

Remark : A new record from Manipur and Mizoram (Mitra 1994).

Intraspecific variation : The specimens do not show any assymetry in venation as observed by Vershney and Prasad (1981). The specimens vary from Fraser's (1936a) description in having labium uniformly dark - reddish brown, small yellow spot behind the head and the extension of the blackish brown marking, at the base of the forewing, up to the discoidal cell.

Taxonomic status of *Orthetrum chandrabali* Mehrotra and *Orthetrum ganeshi* Mehrotra

From the description and figures of *Orthetrum chandrabali* and *O. ganeshi* described by Mehrotra (1959) it appeared that those species are nothing but the synonyms of *Orthetrum triangulare triangulare* (Selys).

Orthetrum glaucum (Brauer)
(Fig. 153)

Libellula glauca Brauer, 1865, *Verh. zool. -bot. Ges. Wien* **15** : 1012.

Orthetrum glaucum, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 39; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 307-309; Lieftinck, 1954, *Treubia* 22 (suppl.) : 135.

Material examined : Arunachal Pradesh : Kameng (231) 1♂, 4.v.1966; North Lakhimpur : 1♀, 28.x.1974; Namdhapa (173) 1♂, 2.v.1981; Siang (76) 1♂, 12.x.1966; (268) 1♀, 14.x.1966; (228) 1♀, 15.x.1966; 1♀, 19.x.1966; (220) 1♂, 20.x.1966; (278) 1♀, 24.x.1966; (19) 3♂, 30.x.1966; Subansiri (85) 1♂, 10.v.1966; (294) 1♀, 13.v.1966; (162) 4♂, 4.xi.1971; Assam : Goalpara (132) 2♂, 2.vi.1973; Manipur : Mao (196) 1♂, 16.ix.1975; Morch (204) 1♂, 25.ix.1975; New Chura Chandpur (216) 3♂, 21.ix.1975; Mizoram : Bluemountain (38c) 1♂, 22.i.1987; Champhai (57b) 1♂, 30.x.1991; Phaileng (228a) 1♂, 23.x.1991; Terei (281b) 8♂, 22.x.1991; 2♀, 24.x.1991; Nagaland : Mokokchung 3♂, 4.ix.1994 and 20.ix.1994; Orissa : Ganjam (104) 1♂, 18.iii.1974; Sikkim : Gangtok (103) 1♂, 21.x.1977; Geyzing (110) 1♂, 1♀, 6.xi.1977; Jorethang (140) 1♂, 1♀, 29.x.1977; Mongan (188) 1♂, 1♀, 29.x.1977; Nayabazar (213) 2♀, 29.x.1977; (229 & 242) 6♂, 2♀, 19.x.1977; Rangpo 1♀, 26.x.1977; Rangdom (242) 5♂, 19.x.1977; 1♂, 21.x.1977; Ranipool, 1♀, 9.x.1988 Tripura : Agartala (2) 1♂, 30.x.1974; Ambassa (107) 1♂, 21.i.1974 Deomali (87) 2♀, 9.xi.1971; Manu (133) 1♀, 25.xi.1974; Teliamura (101) 2♀, 12.xi.1974b Udaipur (105) 1♀, 5.xi.1974. West Bengal : Darjeeling (246a) 1♂, 30.iii.1973; (266) 2♂, 1.iv.1973; (245) 1♂, 9.iv.1973; (266) 1♂, 16.iv.1973; 2♀, 18.iv.1973; (266) 1♂, 2.i.1976. (35a) 1♂, 19.v.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Sikkim (Selys 1891); Darjeeling (Ris 1909b; St. Quentin 1936); Calcutta (Dasgupta 1957) Arunachal Pradesh, Mizoram (Lahiri 1979); Manipur (Lahiri 1977b) Meghalaya (Lahiri 1987); *Northern India* : Uttar Pradesh (Kumar 1982); Almora, Dehra Dun, Nalapani, Thal (Bhasin 1953); Chakrata (8000') (Singh & Baijal 1954); Kangra (Prasad 1976b); Garhwal Hills (Prasad 974). *Central India* : Bastar (Prasad 1996a). *Southern India* : Annamalai, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palni Hills Travancore (Frqser 1931a); *Western India* : Poona (Fraser 1942b); West Coast (Fraser 1936a).

Elsewhere : ASIA : Burma (Laidlaw 1914); Tennasserim (Lieftinck 1948; Ris 1909b; Selys 1891); Borneo, Ceylon, China, Indo-China, Java, Lombok, Moluquas (Ris 1909b); Nepal (Asahina 1955; St. Quentin 1970) Sumatra, Toungoo (Selys 1891); Malayasia (Brooks 1981); Philippines (Fraser 1936a), Thailand (Titayavan 1979), Taiwan (Lieftinck *et. al.* 1984), Hongkong, Indonesia, Japan, Thailand, Vietnam (Tsuda 1991).

Intraspecific variation : Specimens from the eastern Himalaya differs from Fraser's (1936a) description in having labium, labrum and face bluish brown, legs mostly dark brown.

Orthetrum testaceum testaceum
(Burmeister)

Libellula testacea Burmeister, 1839, *Handb. Ent.* **2** : 859.

Orthetrum testaceum, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 39.

Orthetrum testaceum testaceum, Ris, 1910, *Cat. Coll. Selys Lib.* fasc. 10; 181; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 309-310 Lieftinck, 1954, *Treubia* **22** (suppl.) : 138.

Material examined : Arunachal Pradesh : Ziro : Subasiri 1♂, 14.v.1966; Orissa : Mayurbhanj (264a) 1♂, 26.i.1986.

Distribution : *Present records* : Arunachal Pradesh, Orissa. *Past records* : Orissa (Mitra 1994, 2000); Arunachal Pradesh (Ram & Prasad 1999).

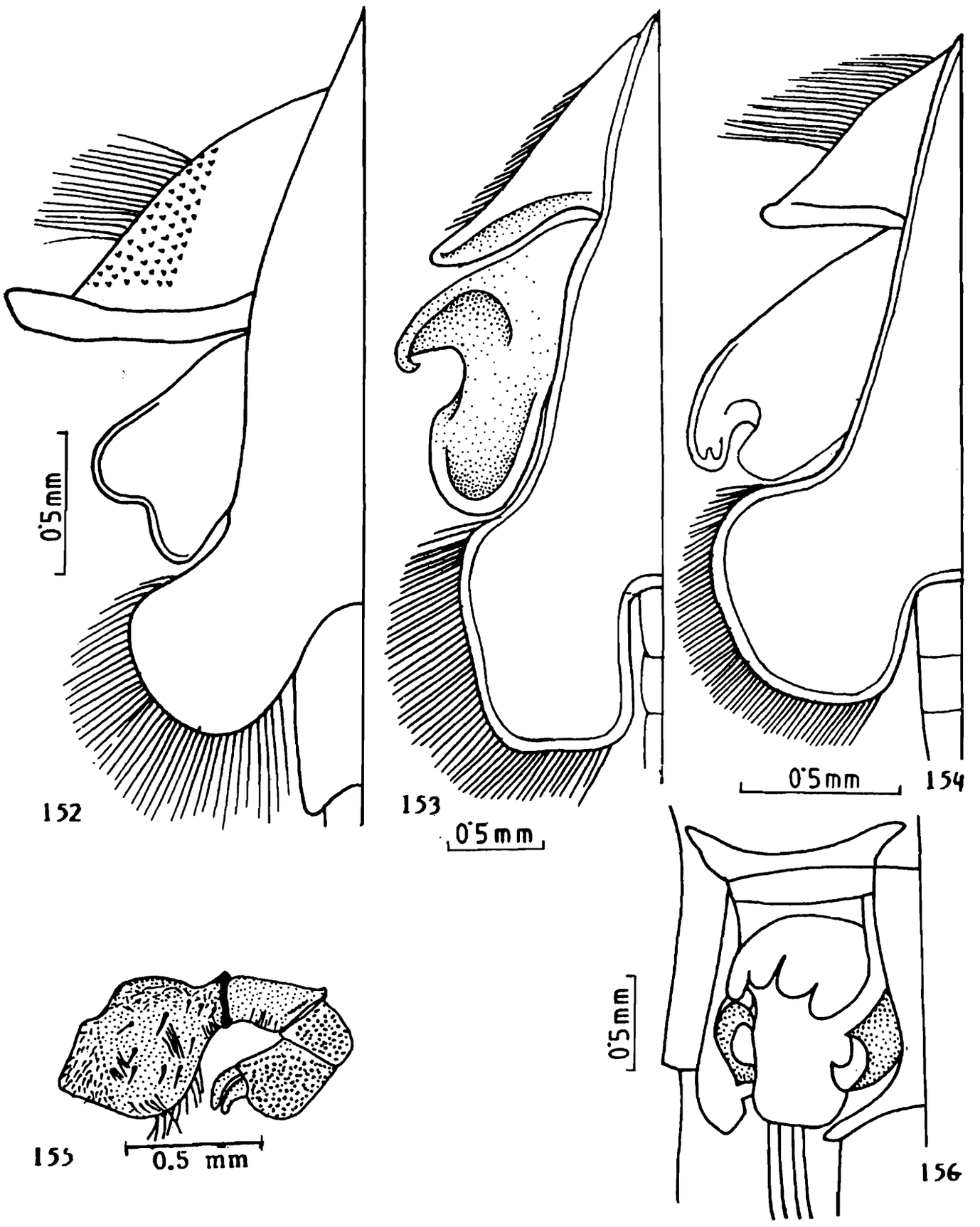


Fig. 152-156. 152. Genitalia of male *Orthetrum japonicum internum* MacLachlan; 153. Same of *O. glaucum* (Brauer); 154. Same of *O. t. triangulare* (Selys); 155. Penis of *Brachydiplax sobrina* (Rambur); 156. Genitalia of *Brachydiplax sobrina*

Elsewhere : ASIA : Bangladesh, Chittagong (Chowdhury & Akhteruzzaman 1981): Burma (Fraser 1918b; Ris 1909b), Bhamo (Selys 1891); China (Klots 1947, Needham 1930); Borneo (Ris 1909b, Selys 1891); Formosa, Hainan, Indo-China, Java, Palwan, Penang, Philippines (Ris 1909b); Singapore (Kiauta & Kiauta 1982b); Sumatra (Selys 1891). Taiwan (Lieftinck *et. al.* 1984); Celebes (Fraser 1936a; Ris 1909b). Indonesia, Malayasia, Thailand, Vietnam (Tsuda 1991).

Remark : New records from India (Mitra 1994).

Orthetrum pruinosum neglectum (Rambur) (Figs. 147, 185)

Libellula neglecta Rambur, 1842, *Ins. Nevrop.* p. 86.

Orthetrum pruinesum neglectum, Ris, 1909, *Cat. Coll. Selys* fasc. 9; 181; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 311-313; Lieftinck, 1954, *Treubia* 22 (suppl) : 137.

Material examined : Arunachal Pradesh : Kameng (288) 2♂, i.v.1966; (165) 1♀, 9.v.1966; (123) 1♂, 15.v.1966; Subansiri (85) 1♂, 10.v.1966; (294) 1♀, 13.v.1966; (279) 2♂, 20.v.1966; (28) 2♂, 1♀, 27.x.1966; (80) 3♂, 1♀, 28.x.1966; Tirap; (139a) 1♂, 25.x.1971; (212) 1♂, 28.x.1971; (87) 2♂, 1♀, 9.xi.1971; (212) 1♂, 1♀, 10.xi.1971; (87) 2♂, 1♀, 11.xi.1971. Assam : Barpeta (146) 1♂, 2♀, 1.iv.1986; Bamangiri (17) 1♂, 15.v.1979; Cachar (51) 2♂, 24.xi.1981; 2♀, 5.xii.1983; Dhubri (89) 1♂, 2.xi.1974; Goalpara (132) 2♂, 2.vi.1973; 1♂, 20.vi.1973; Assam Hill Forest (9) 2♂, 15.xi.1974; Mikir Hills (200) 1♂, 3.xi.1974; Nissangaon (217) 1♂, 25.v.1979; Bihar : Hazaribagh (126) 1♂, 2.xi.1974; Singhbhum (24) 1♂, 4.xii.1974. Manipur : Chandpur (63) 1♂, 21.ix.1975; Mao (192b) 1♂, 16.ix.1975; Moirang 1♀, 31.xi.1983; Morch (West) 1♂, 16.ix.1975; New Chura Chandpur (46) 3♂, 19.ix.1975; (204) 2♀, 27.ix.1975; Mizoram : Aizwal; Bung (45a) 1♂, 26.x.1991; Champhai (57b) 1♂, 29.x.1991; 1♂, 31.x.1991; 1♀, 2.xi.1991; Terai (281b) 9♂, 22.x.1991; 1♂, 23.x.1991; 6♂, 1♀, 24.x.1991; 2♂, 25.x.1991; Nagaland : Kohima (169) 1♀, 28.xi.1983; Orissa : Amanda Road (6) 1♂, 22.iii.1973; Bolangir (38b) 1♂, 8.xi.1973; Cuttack (74) 1♂, 16.i.1974; Keonjhargarh (159a) 1♂, 20.ix.1972; 1♂, 22.iii.1973; 1♂, 30.iii.1973; Tikarpara (284) 1♂, 24.i.1974; Sikkim : Bygoria (50) 1♂, 30.x.1977; Phensong (229) 1♂, 19.x.1977; Rangdom (242) 1♂, 19.x.1977; Ranipool (246a) 12♂, 2♀, 9.x.1988; 6♂, 2♀, 12.x.1988; Tumin (287a) 6♂, 1♀, 1.x.1988; Tripura : Agartala (232) 1♀, 30.x.1974; 1♀, 31.x.1974; (242) 3♂, 6.xi.1970; Ambassa (4) 4♂, 17.xi.1974; (152) 1♀, 20.xi.1974; Belonia (28a) 2♀, 3.x.1977; Manu (192a) 1♂, 10.xi.1974; (189) 5♂, 1♀, 23.xi.1974; 1♂, 1♀, 24.xi.1974; (133) 3♂, 1♀, 25.xi.1974; 1♂, 26.xi.1974; Teliamura (281a) 1♂, 1♀, 11.xi.1974; 2♂, 12.xi.1974; (170) 2♂, 13.xi.1974; (23) 1♂, 21.x.1977; Udaipur (106) 2♂, 1♀, 4.xi.1974; 1♂, 6.xi.1974; 1♂, 1♀, 8.xi.1974. West Bengal : Darjeeling (246a) 2♂, 31.iii.1973; (266) 1♂, 16.iv.1973; 1♂, 18.iv.1973.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Barkuda Island (Fraser & Dover 1922); Upper Assam (Laidlaw 1914); Darjeeling (Ris 1909b); Arunachal Pradesh, Assam, Manipur, Mizoram (Lahiri 1979); Meghalaya (Lahiri 1987) Tripura (Lahiri 1977a); Buxa, Nagaland (Bhasin 1953) Bhubaneswar (Dasgupta 1957); *Northern India* : Uttar Pradesh (Kumar 1982); Kulu, Manali (Singh *et. al.* 1955); Dehra Dun (Bhasin 1953); Kashmir (Ris 1909b) Garhwal Hills (Prasad 1974); Kangra (Prasad 1976); Rajasthan (Prasad & Kumar 1981); *Central India* : Gwalior (Baijal & Agarwal 1955); Betul, Chhindhwara (Mitra 1988);Bastar (Prasad 1996a). *Southern India* : Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palnis, Travancore

(Fraser 1931a); Madras (Ris 1909b). Silent valley (Rao & Lahiri 1983); Andaman Islands (Fraser 1924a). *Western India* : Goa (Prasad 1995); Maharashtra (Prasad 1996b); Gujarat (Prasad 1984).

Elsewhere : ASIA : Annam (Ris 1909b); Burma (Laidlaw 1914, Fraser 1918b) Ceylon (Fraser 1918b; 1924a; Lieftinck 1971b); Hongkong (Ris 1909b); Java (Selys 1891); Nepal (St. Quentin 1970; Kiauta & Kiauta 1982a); Philippines (Selys 1891); Yunnan (Ris 1909b). Celebes (Selys 1891). Afghanistan, Bangladesh, Burma, China, Indonesia, Japan, Laos, Malayasia, Singapore, Thailand, Taiwan, Vietnam (Tsuda 1991).

Remark : New record from Bihar (Mitra 1994).

Intraspecific variations : The male specimens (14♂) from Andaman Islands vary from the specimens under study in having metallic blue black vesicle and brown thorax. The specimens from West Bengal, Assam, Bihar and Orissa vary from the specimens from other parts of eastern India since the formers have labium ochreous, lateral lobes with thick black mark, face and lower border of frons bluish yellow, middle portion of the anterior lobe of prothorax yellow.

Genus ***Palpopleura*** Rambur

Palpopleura Rambur, 1842, *Ins. Nevrop.* p. 129 : Brauer, 1868, *Verh. zool. -bot. Ges. Wien* **18** : 365; Ris, 1910, *Cat. Coll. Selys* fasc. **11** : 24; 316-318; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 316; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 49.

Type-species : *Palpopleura vestita* Rambur

Distribution : India, Nepal, China, Bangladesh, Burma, Vietnam, Africa, Madagascar, Fraser (1936a) reported it from Ceylon and Malayasia, which, however, was not confirmed by Laidlaw (1951) and Lieftinck (1954 & 1971).

Palpopleura sexmaculata sexmaculata (Fabricius) (Figs. 13, 160)

Libellula sexmaculata Fabricius, 1787, *Mant. Ins.* **1** : 338; 1793, *Ent. Syst.* **2** : 381; Rambur, 1842, *Ins. Nevrop.* p. 126. *Palpopleura sexmaculata* Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 716.

Palpopleura sexmaculata sexmaculata Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 318-320.

Material examined : Arunachal Pradesh : Chandan Forest (60) 1♂, 24.iii.1973; Subansiri (123) 2♀, 15.v.1966; Assam : Assam foot hill (8) 1♀, 1.iii.1973; Goalpara (235) 1♂, 3♀, 14.vi.1973; Manipur : Central district (186) 1♀, 12.ii.1975; Morch (204) 1♂, 27.ix.1975; New Chura Chandpur (46) 3♀, 18.ix.1975; 4♂, 6♀, 19.ix.1975; 2♀, 21.ix.1975; Songsang (270) 1♀, 13.ix.1975; Ukhrul (292) 1♀, 4.iii.1975; Mizoram : Bung (45a) 3♂, 2♀, 26.x.1991; Champhai (57b) 4♂, 9♀, 29.x.1991; Phaileng (228a) 3♂, 5♀, 23.x.1991; Terei (281b) 1♀, 22.x.1991; 4♂, 1♀, 24.x.1991; 1♂, 1♀, 25.x.1991; Nagaland : Botsa (41) 1♂, 2♀, 30.xi.1983; Sikkim : Dentam (86) 1♂, 1♀, 2.xi.1977; Mongan (188) 1♀, 24.x.1977; 1♀, 29.x.1977; Nayabazar (213) 1♂, 30.x.1977, Rangdom (242) 1♂, 2♀, 19.x.1977; Ranipool (246) 2♀, 9.x.1988; 3♂, 2♀, 12.x.1988; Tumin (287a) 1♂, 30.ix.1988; 1♂, 1.x.1988; Tripura Agartala (2) 2♂, 1♀, 10.xi.1972; (2) 1♀, 29.x.1974, Ambassa (93) 3♂, 10.xi.1974; 3♀, 18.xi.1974; Hathalia (125) 1♂, 5.xii.1969; Manu (133) 2♂, 1♀, 25.xi.1974; (192a) 4♂, 6♀, 26.xi.1974; Teliamura (281a) 1♀, 13.xi.1974; Udaipur (106) 7♂, 3♀, 8.xi.1974; West Bengal : Darjeeling (246a) 1♂, 2♀, 28.iii.1973; (245) 6♂, 2♀, 7.iv.1973, (266) 2♀, 19.iv.1973; (245) 2♂, 1♀, 10.iv.1973; (266) 1♂, 18.iv.1973; (35a) 2♂, 1♀, 21.v.1973;

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Mizoram, Nagaland, Sikkim, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Pusa, Shillong (Fraser 1919d) Darjeeling, Sikkim (Ris 1910); N. Lakhimpur (Laidlaw 1914); Manipur, Mizoram (Lahiri 1979); Meghalaya (Lahiri 1987); Singhbhum (Bhasin 1953); Assam, Bengal (Fraser 1936a). *Northern India* :

Uttar Pradesh (Kumar 1982); Naini Tal, Dehra Dun, Mothronwala (Bhasin 1953); Garhwal Hills (Prasad 1974); Kangra (Prasad 1976a). *Southern India* : Kodai Kanal, Palni, Nilgiris, Wynaad (Fraser 1924b); Annaimalai, Cochin, Coorg, Malabar, Travancore (Fraser 1931a); Tamil Nadu (Kumar 1990). *Central India* : Bastar (Prasad 1996a).

Elsewhere : ASIA : Annam (Ris 1910); Burma (Laidlaw 1914); Leito, Puepoli, Monts Carin (Selys 1891); Ceylon (Fraser 1919d); China (Chao 1981, Needham 1930); Indo-China, Malayasia (Fraser 1936a); Nepal (Asahina 1955; Mahato 1988, St. Quentin 1970); Yunnan (Moore 1878). Afghanistan, Hong Kong, Laos, Thailand, Vietnam (Tsuda 1991).

Remark : New record from Arunachal Pradesh, Nagaland (Mitra 1994).

Intraspecific variation : The specimens under study agree with Fraser's (1936a) description. However, they posses antenodal in forewing 9-11; in hindwing 6-8; postnodals in forewing 6-7 in hindwing 5-6. One male specimen from Sikkim does not contain the white spot on pterostigma, and a female from the same state contain an extra-brown spot on wing.

Genus ***Brachydiplax*** Brauer

Brachydiplax Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 172. 368; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 323; Lieftinck, 1954, *Treubia* **22** (suppl.) : 143; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 42.

Type-species : *Libellula sobrina* Rambur

Distribution : India, Nepal, Sri Lanka, Burma, Thailand, Bangladesh, Vietnam, Malayasia, Indonesia, New Guinea, Australia.

Key to species of genus *Brachydiplax* Brauer

Base of wing uncoloured ... *sobrina* (Rambur)

Base of wing coloured 2

Abdomen 17-19 mm ..... *farinosa* Kruger

Abdomen 21-25 mm .....
..... *chalybea chalybea* Brauer

Brachydiplax sobrina (Rambur)
(Figs. 155, 156, 194)

Libellula sobrina Rambur, 1842, *Ins. Nevrop.* p. 114.

Brachydiplax sobrina, Kirby, 1893, *J. Linn. Soc. zool.* **24** : 551; Fraser, 1936, *Fauna Brit. India Odon* **3** : 325-327 Lieftinck, 1954, Treubia **22** (suppl.) : 145.

Material examined : Nagaland : Rangapahar 1♂, 19.ix.1994; Orissa : Cuttack (74) 2♂, 24.iii.1974; Tripura : Ambassa (5) 1♀, 16.xi.1974; West Bengal : Birbhum (260) 1♂, 1♀, 9.x.1974; Calcutta 2♂, 2.x.1966; 1♀, 11.iii.1967; 2♂, 7.iv.1967; 1♂, 1♀, 15.iv.1967; 1♂, 21.v.1967; 1♂, 2.viii.1967; Howrah 1♀, 6.x.1977; Kochbehar 1♀, 2.ix.1983; 24-Parganas (24a) 1♂, 7.ix.1974.

Distribution : *Present records* : Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Chilka Lake (Laidlaw 1915d); Dejoo, N. Lakhimpur (Laidlaw 1914); Barkuda Island (Fraser & Dover 1922); Calcutta, Pusa (Ris 1910) Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Dehra Dun, Kangra Hoshiarpur (Singh & Prasad 1974); Rajasthan (Prasad & Thakur 1981) *Western India* : Bombay (Fraser 1919d); *Southern India* : Coorg, Deccan, Malabar, Nilgiris (Fraser 1931a); Andhra Pradesh (Joseph & Satyarani 1988). *Central India* : Bastar (Prasad 1996a).

Elsewhere : ASIA : Bangladesh, Sylhet; Burma (Ris 1910); Bhamo, Palon, Teinzo, Toungoo, (Selys 1891); Ceylon, Thailand (Lieftinck 1971b); Nepal (Kiauta & Kiauta 1982a, St. Quentin 1970).

Intraspecific variation : The specimens vary from Fraser's (1936a) description in having labium yellow, lateral lobes without any black marking; occiput black, with two narrowly separated yellow spot; antenodals in forewing 5-7, hindwing 5-6; postnodals in fore wing 5-6 and in hindwing 6.

Brachydiplax farinosa Kruger

Brachydiplax farinosa Kruger, 1902, *Stett. Ent. Zeit.* **63** : 135; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 327 : Lieftinck, 1954, *Treubia* **22** (suppl.) : **144.**

Material examined : West Bengal : Howrah 2♂, 18.x.1974; 24 Parganas 1♂, 8.ii.1967; 2♂, 30.x.1967.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Bengal (Fraser 1936a); Midnapore (Dasgupta 1957); Howrah, 24 Parganas dist. (Ram *et. al.* 1982).

Elsewhere : ASIA : Burma (Ris 1910; Fraser 1919d; 1936a); Malacca (Ris 1910); Malayasia (Fraser 1936a; Lieftinck 1954 : Brooks 1981); Sumatra, Siam (Fraser 1936a; Lieftinck 1954); Thailand (Kiauta & Kiauta 1983b).

Brachydiplax chalybea chalybea Brauer

Brachydiplax chalybea Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 173; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 328-329.

Brachydiplax chalybea chalybea Lieftinck, 1954, *Treubia* **22** (suppl.) : 143.

Material examined : West Bengal : Calcutta 1♂, 7.ix.1966.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Howrah (Dasgupta 1957). Calcutta (Mitra 1983); Gauhati, Assam (Fraser 1936a); Orissa (Chakraborty *et. al.*.1999) Andaman (North & South), Great Nicobar (Hämäläinen *et. al.* 1999)

Elsewhere : ASIA : Borneo, Burma, Tonkin (Ris 1910); China (Needham 1930); Rowe 1981); Malayasia (Brooks 1981, Lieftinck 1954); Malacca, Sumatra (Ris 1910); Singapore (Ris 1910).

Intraspecific variations : The specimen varies from 2♂ specimens from Burma as well as from Fraser's (1936a) description in having distal half of labial lateral lobes black, both face and frons pale greenish yellow; occiput brown with conspicuous spots; thorax brown with thin pruinescens on the dorsum but turns greenish yellow on the lateral sides; antenodals in forewing 6; hindwing 6; postnodals in both wings 7.

Genus ***Acisoma*** Rambur

Acisoma Rambur, 1842, *Ins. Nevrop.* p. 26; Brauer, 1868, *Verh. zoo.-bot. Ges. Wien* 18 : 367; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 329; Lieftinck, 1954, *Treubia* 22 (suppl.); 146; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species : *Acisoma panorpoides* Rambur

Distribution : India, Nepal, China, Sri Lanka, Burma, Thailand, Malayasia, Indonesia, Japan, Taiwan, Philippines, Africa, Madagascar.

Acisoma panorpoides panorpoides (Rambur) (Figs. 159, 164, 195)

Acisoma panorpoides Rambur, 1842, *Ins. Nevrop.* p. 28., Lieftinck, 1954, *Treubia* **22** (suppl.) : 146.

Acisoma panorpoides panorpoides Ris, 1911, *Cat. Coll. Selys Lib.* **12** : 456; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 330-331.

Material examined : Assam : Barpeta (3) 1♀, 4.iv.1986. Mizoram : Terai (281b) 1♂, 24.x.1991; Nagaland : Dimapur 1♀, 11.ix.1994; Orissa Bolangir (38b) 1♂, 11.xi.1972; Cuttack (74) 1♀, 24.iii.1974; Puri (233) 1♂, 27.iii.1974; Tripura : Abhoy Nagar (31) 1♂, 31.x.1974; West Bengal : Calcutta 1♂, 9.x.1966; 1♂, 2.xi.1966; 1♀, 5.iii.1967; 1♀, 16.vii.1967. 24 Parganas (24a) 1♀, 7.ix.1974.

Distribution : *Present records* : Assam, Mizoram, Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Manipur (Lahiri 1977b); Assam, Arunachal Pradesh (Lahiri 1979); Meghalaya (Lahiri 1987); Calcutta (Dasgupta 1977; Mitra 1983); Sibsagar (Bhasin 1953). *Northern India* : Rajasthan (Prasad & Thakur 1981); Doon Valley (Singh & Prasad 1976); Garhwal Hills (Prasad 1974), Kanga (Prasad 1976) Uttar Pradesh (Ram *et. al.* 1983); *Western India* : Bombay Poona (Fraser 1924b). *Southern India* : Coorg, Palnis, Nilgiris, Khandala (Fraser 1924b); Cochin, Deccan, Kanara, Malabar (Fraser 1931a); Tamil Nadu (Kumar 1990); Andhra Pradesh (Joseph & Satyarani 1988). Great Nicobar Island (Mitra 1995a). *Central India* : Gwalior (Baijal & Agarwal 1955); Bastar (Prasad 1996a).

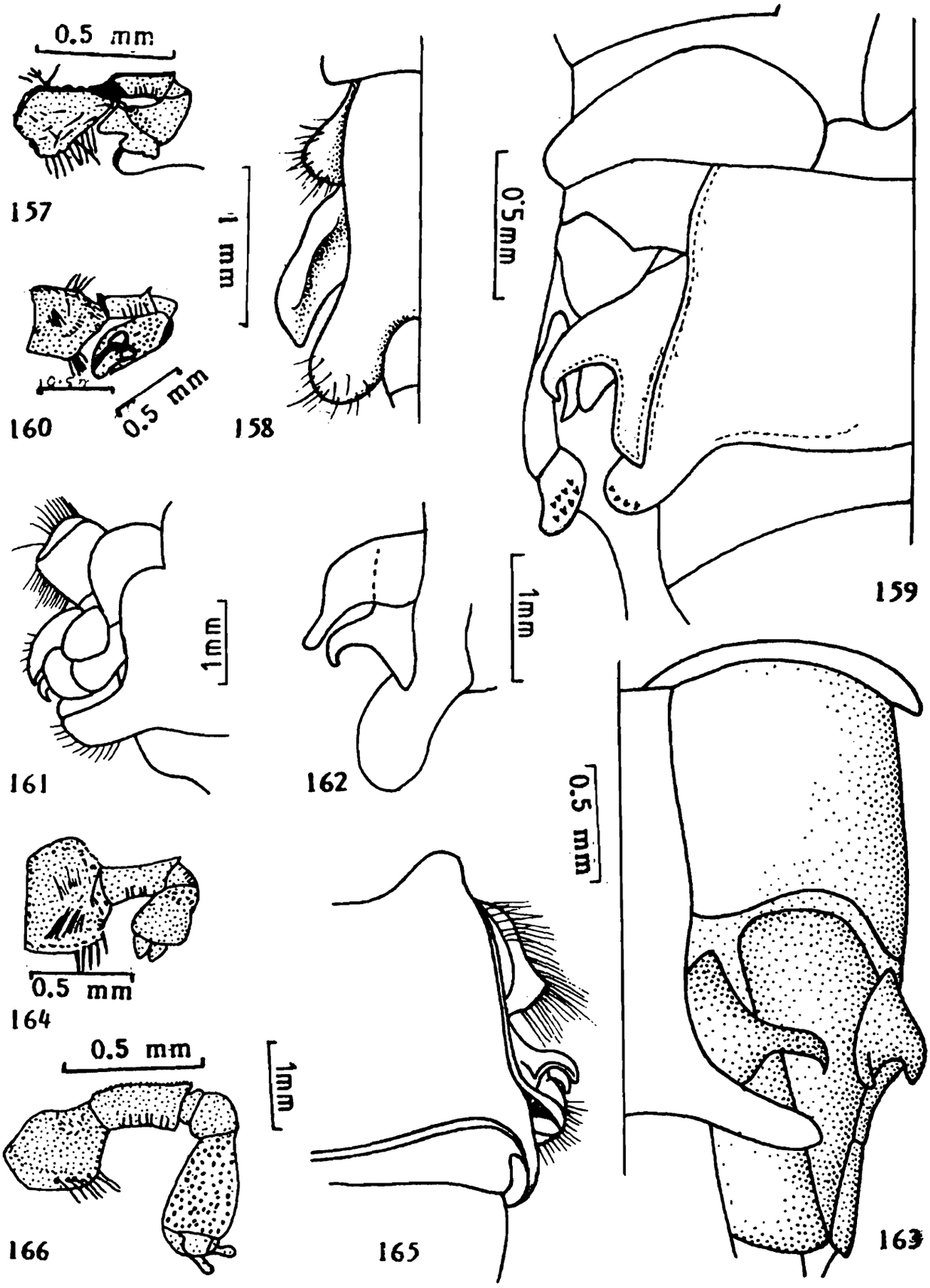


Fig. 157-166. 157. Penis of *Orthetrum s. sabina* (Drury); 158. Genitalia of male *Crocothemis s. servilia* (Drury); 159. Genitalia of male *Acisoma p. panorpoides* Rambur; 160. Penis of *Palpopleura s. sexmaculata* (Fabricius); 161. Genitalia of male *Indothemis l. limbata* (Selys); 162. Genitalia of male *Indothemis carnatica* (Fabr.); 163. Genitalia of male *Rhyothemis v. variegata* (Linn.); 164. Penis of *Acisoma p. panorpoides*; 165. Genitalia of male *Rhyothemia plutonia* Selys; 166. Penis of *Diplacodes trivialis* (Rambur)

Elsewhere : ASIA : Bangladesh, Sylhet (Dasgupta 1957); Burma (Laidlaw 1914); Bhamo, Loo-choo, Palon, Toungoo (Selys 1891); Ceylon (Fraser 1919d); China (Chao 1981, Needhan 1930); Southern Japan, Taiwan (Lieftinck 1971b); Thailand (Kiauta & Kiauta 1983b). Nepal (Kiauta 1975; Mahato 1988, St. Quentin 1970) Celebes, Moluccans (Lieftinck 1971b).

Remark : New record from Mizoram, Orissa and Tripura (Mitra 1994).

Intraspecific variations : Male specimens of West Bengal and Orissa vary from specimens collected from Tripura and from Fraser's (1936a) description in having labrum brownish yellow, abdomen brownish red or red and the latter tint is restricted on segments 5-7. The vescicle and the occiput of the female are bluish-yellow.

Genus ***Diplacodes*** Kirby

Diplacodes Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 263; Fraser, 1936, *Fauna Brit. India. Odon* **3** : 331; Lieftinck, 1954, *Treubia* **22** (suppl.) : 146; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 47.

Type-species : *Libellula lefebvrei* Rambur

Distribution : India, Sri Lanka, Burma, China, Thailand, Vietnam, Malayasia, Indonesia, New Guinea, Japan, Ryuku, Taiwan, Philippines, Australia, Pacific Islands, Iraq, Saudi Arabia, Turkey, Mauretius, Africa, Madagascar, Seychelles.

Key to species of genus *Diplacodes* Kirby

Length of hindwing 17-19 mm .... *nebulosa* (Fabricius)

Length of hindwing 22-24 mm .... *trivialis* (Rambur)

Diplacodes nebulosa (Fabricius) (Fig. 183)

Libellula nebulosa Fabricius 1793, *Ent. Syst.* 2 : 379.

Diplacodes nebulosa, Kirby, 1889, *Trans, Zool. Soc. Lond.* **12** : 308; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 335-336; Lieftinck, 1954, *Treubia* 22 (suppl.) : 146.

Material examined : Assam : Barpeta (92) 2♂, 10.iv.1986; Orissa : Anugul (7) 1♂, 9.iv.1973; Bolangir (38b) 1♂, 10.xi.1972; 1♂, 6.xii.1965 Dhenkanal (88) 1♂, 9.iv.1973; West Bengal : Birbhum (255) 1♂, 11.ix.1974; 1♂, 9.x.1974; Calcutta (52) 1♂, 28.x.1966; 1♂, 5.iii.1967; Darjeeling (246a) 1♂, 28.iii.1973.

Distribution : *Present records* : Assam, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Assam (Lahiri 1979); Calcutta, Puri (Dasgupta 1957); Sikkim (Prasad & Ghosh 1984b); Dibrugarh, N.E. Assam (Laidlaw 1914); Bengal (Fraser 1919c); Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Dehra Dun, Kangra (Singh & Prasad 1974); Allahabad, (Bhasin 1953). Rajasthan (Prasad & thakur 1981). *Southern India : Coorg* (Fraser 1924b); Deccan, Malabar, Nilgiris (Fraser 1931a). Madras (Fraser 1919d); Andhra Pradesh (Joseph & Satyarani 1988). *Central India* : Bhandara (Bhasin 1953); Bastar (Prasad 1996a).

Elsewhere : ASIA : China (Needham 1930); Java (Fraser 1919d); Burma, Palon Toungoo (Selys 1891) : Tennasserim (Lieftinck 1948); Ceylon (Lieftinck 1971b; Selys 1891); Singapore (Fraser 1919d); Indonesia, Kampuchea, Malayasia, Nepal, Philippines, Thailand (Tsuda 1991). AUSTRALIA and PAPUAN REGION (Lieftinck 1971b).

Intraspecific variations : The specimen from Darjeeling differs from Fraser's (1936a) description since it bears dark brown labium, also due to the extension of apical brown mark of the wings beyond pterostigma.

Diplacodes trivialis (Rambur) (Fig. 166)

Libellula trivialis Rambur, 1842, *Ins. Nevrop.* p. 115.

Diplacodes trivialis Ris, 1911, *Cat. Coll. Selys Lib.* **12** : 462; Fraser, 1936, *Fauna Brit. India. Odon* **3** : 336-338; Lieftinck, 1954, *Treubia* **22** (suppl.) : 147.

Material examined : Arunachal Pradesh : Chandan Forest (60) 1♀, 24.iii.1973; Namsai (269) 1♀, 16.iii.1969; Assam : Bijani (36) 1♀,

12.xi.1974; Cachar (178) 2♀, 30.x.1975 (51) 1♀, 30.ix.1975; 1♀, 2.x.1975; Goalpara (145) 1♂, 25.v.1973 (132) 1♀, 4.vi.1973; 1♂, 6.vi.1973; (235) 1♂, 1♀, 10.vi.1973; 1♀, 13.vi.1973; (145) 1♀, 19.vi.1973; (217) 1♂, 17.v.1979; (178) 1♀, 30.ix.1975; Bihar : Hazarbagh (126) 1♀, 29.x.1974; 2♂, 1♀, 31.x.1974; 1♀, 2.xi.1974; Palamau (191) 3♀, 12.xi.1974; Singhbhum (24) 1♀, 4.xii.1974; Manipur : Imphal (130) 1♂, 6.x.1975; Keibul (157) 1♀, 7.ii.1975; 1♀, 30.xii.1975. Mao (192b) 1♀, 13.ii.1975; Morch (204) 2♂, 1♀, 27.i.1975; 5♂, 5♀, 24.xi.1983; New Chura Chandpur (46) 1♀, 18.ix.1975; 1♂, 3♀, 19.ix.1975; Ukhrul (290a); Mizoram : Champhai (57b) 1♂, 29.x.1991; Phaileng (228a) 2♂, 23.x.1991; Terei (281b) 1♂, 1♀, 24.x.1991; Orissa : Anugul (7) 5♂, 4♀, 1.x.1972; 3♂, 2.x.1972; 1♂, 2♀, 3.x.1972. Bangriposi (19a) 2♂, 3♀, 13.ix.1972; 4♀, 14.ix.1972; 1♀, 16.ix.1972; 1♂, 1♀, 15.x.1972; Bolangir (386) 1♂, 1.x.1972; 2♂, 2♀, 2.xi.1973; 1♀, 8.xi.1973; 3♂, 3♀, 10.xi.1972; 1♂, 11.xi.1972; 2♂, 16.xi.1972; Dhenkanal (88) 1♀, 7.x.1972; 2♂, 9.iv.1973; Dhutra (90) 1♀, 18.ix.1972; Ganjam (104) 1♀, 13.iii.1974; Jharpara (137) 1♂, 2♀, 30.x.1972; 1♀, 5.xii.1972; Kalahandi (147) 1♀, 6.xii.1973; Keonjhargarh (159) 2♂, 1♀, 23.ix.1972; 1♂, 3♀, 24.ix.1972; 1♀, 28.iii.1973; 1♂, 2♀, 31.iii.1973; 1♀, 2.iv.1973; (168) 1♀, 24.xi.1973; Kotagarh (171) 1♀, 24.v.1972; Malkangiri (187) 2♀, 2.xii.1973; Mayurbhanj (264a) 2♂, 26.i.1986; Puri (233) 1♂, 8.iii.1974; 1♀, 17.iii.1974; 1♂, 18.iii.1974; 1♂, 20.iii.1974; 1♂, 22.iii.1974; 1♀, 25.iii.1974; Sambalpur (252) 1♂, 28.iii.1974; 2♀, 23.x.1973; 1♂, 7.x.1972; Sundergarh (275) 1♀, 22.ix.1972; 2♂, 6♀, 24.x.1972; 3♀, 26.x.1972; 2♀, 29.iii.1973; (275) 2♂, 3♀, 17.x.1973; 1♀, 24.iii.1974. Sikkim : Gangtok (103) 1♀, 27.x.1977; (188) Mangan (188) 1♂, 24.x.1977; Tripura : Agartala (232) 3♀, 29.x.1974; (2) 1♂, 3♀, 30.x.1974; 1♂, 1♀, 31.x.1974; Ambassa (4) 1♀, 10.xi.1974; (5) 1♀, 16.xi.1974; (93) 2♂, 1♀, 18.xi.1974; (152) 2♂, 20.xi.1974; Belonia (28a) 1♂, 1.x.1977; Panalia East (224) 1♂, 9.x.1977. Teliamura (43) 2♂, 2♀, 10.xi.1974; 3♀, 30.x.1974; Kosilong (170) 3♀, 13.xi.1974. 1♂, 14.xi.1974; Udaipur (106) 1♀, 10.xi.1974; West Bengal : Bankura (69) 1♂, 3♀, 31.vii.1974; (21) 2♂, 6♀, 1.viii.1974; (277) 2♂, 2♀, 2.viii.1974; (139) 5♀, 3.viii.1974; Birbhum (236) 8♂, 12♀, 11.ix.1974; (271) 1♀, 12.ix.1974; 1♀, 5.x.1974; 7♂, 30♀, 6.x.1974; 15♂, 10♀, 7.x.1974; 27♂, 22♀, 8.x.1974; 9♂, 22♀, 9.x.1974; Calcutta (52) 1♂, 1♀, 7.ix.1966; 1♂, 2♀, 18.ix.1966; 1♂, 2♀, 18.ix.1966; 1♂, 2♀, 22.ix.1966; 1♂, 4♀, 2.x.1966; 1♂, 8.x.1966; 1♂, 14.x.1966; 1♂, 16.x.1966; 1♀, 23.x.1966; 1♀, 28.x.1966; 3♀, 20.xi.1966; 1♂, 27.xi.1066; 1♀, 4.xii.1966; 3♀, 12.ii.1967; 1♀, 5.iii.1967; 1♂, 1♀, 9.iv.1967; 1♀, 13.v.1967; 1♀, 14.v.1967; 1♀, 27.v.1967; 1♂, 30.vi.1967; 1♀, 18.vii.1967; 1♂, 2♀, 23.vii.1967; 1♀, 6.viii.1967; 1♂, 4.ii.1968; Darjeeling (182) 1♀, 29.iv.1971; (266) 1♂, 18.iv.1973; (71) 1♀, 20.viii.1978; Jalpaiguri (248) 1♂, 9.ix.1975; Kochbehar (166) 1♀, 31.viii.1983; 24 Parganas (209a) 1♂, 14.viii.1966; (124) 3♂, 2♀, 18.viii.1973; 3♂, 1♀, 20.viii.1973; (24a) 2♀, 7.ix.1974; (10a) 1♀, 15.ix.1983; (119a) 1♂, 16.ix.1983; (32a) 1♀, 18.ix.1983.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Orissa, Sikkim, Tripura, West Bengal. *Past records* : INDIA : *Eastern India* : Chilka Lake (Laidlaw 1915d); Assam, Manipur, Mizoram (Lahiri 1979) : Tripura (Lahiri 1977a) Calcutta, Puri (Dasgupta 1957); Barkuda Island (Fraser & Dover 1922) Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Kangra (Prasad 1976); Doon Valley (Singh & Prasad 1976). *Central India* : Bhandara, Raipur (Bhasin 1953); Chhindwara, Seoni (Mitra 1988); Bastar (Prasad 1996a). *Western India* : Mahabaleswar (Fraser 1921d); Goa (Prasad 1995); Maharashtra (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1984). *Southern India* : Madras (Dasgupta 1957); Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Silent Valley (Rao & Lahiri 1983). Andaman Is. (Fraser 1924a); Great Nicobar Is. (Mitra 1995a).

Elsewhere : ASIA : Burma (Laidlaw 1914); Bhamo, Mandalaya, Malay, (Selys 1891); Tennasserim (Lieftinck 1948); Chittagong (Chowdhury & Akhteruzzaman 1981); Ceylon, Rockhampton (Brauer 1869); China, Formosa (Needham 1930) : Japan, Malay (Selys 1891); Philippines (Asahina 1968; Kiauta & Kiauta 1983a) Nepal (Asahina 1955; Kiauta 1975; St. Quentin 1970); Taiwan (Lieftinck *et. al.* 1984), Micronesia (Lieftinck 1962); AUSTRALIA (Tsuda 1991).

Intraspecific variations : Male specimen (7♂) from the Andaman Is. vary from the male specimens of eastern India due to the absence of Prothoracic middorsal stripe in the former; while the females of Andaman Is. (12♀) differ due to the possession of yellow frons, blackish brown on the lateral sides of the synthorax, brown stripes on the lateral sides of the segment 10. Male specimens from Darjeeling, Sikkim, and Manipur vary from one male from Maharashtra, specimens from other parts of eastern India and from Fraser's (1936a) description in having labium, labrum, bases of mandibles bluish white, face, frons vescicle pale blue; prothorax black, legs bluish yellow.

Genus *Indothemis* Ris

Indothemis Ris, 1909, *Cat. Coll. Selys*, fasc. **9** : 29; Fraser, 1936, *Fauna Brit. India. Odon.* 3 : 338; Lieftinck, 1954, *Treubia* **22** (suppl.) : 148; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 47.

Type-species : *Libellula carnatica* Fabricius (=*Libellula caesia* Rambur).

Distribution : Oriental region.

Key to Species of Genus *Indothemis* Ris

1. Cu_2 in hindwing at the distal point of the discoidal cell ..... *limbata limbata* (Selys)
- Like *limbata limbata* but face purely black ..... *limbata sita* Campion
- Cu_2 in hindwing distal to the distal point of the discoidal cell ..... *carnatica* (Fabr.)

Indothemis limbata limbata (Selys) (Fig. 161)

Tritlıemis limbata Selys, 1891, *Ann. Mus. Civ. Genova* (2) **10** (30) : 463.

Indothemis limbata, Ris, 1911, *Cat. Coll. Selys* fasc. **13** : 530-531.

Indothemis limbata limbata, Fraser, 1936, *Fauna Brit. India Odon.* **3** : 341-342; Lieftinck, 1954, *Treubia* **22** (suppl.) : 148.

Material examined : Assam : Barpeta (146) 1♀, 31.iii.1986; Goalpara (132) 2♀, 8.vi.1973; 1♂, 2♀, 9.vi.1973; (235) 1♂, 6♀, 10.vi.1973; 6♀, 12.vi.1973; 2♀, 13.vi.1973; (145) 2♀, 26.vi.1973; Mizoram : Terei (281b) 1♀, 22.x.1991; Orissa : Bolangir (38b) 1♂, 11.xi.1972; West Bengal : Darjeeling (266) 1♂, 18.iv.1973.

Distribution : *Present records* : Assam, Mizoram, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh (Prasad 1997c). *Southern India* : Coorg (Fraser 1924b).

Elsewhere : ASIA : Burma, Siam, Malacca (Fraser 1936a); Malayasia, Singapore, Thailand (Tsuda 1991).

Remark : A new record from Eastern India (Mitra 1994).

Female

Abdomen 25-26 mm Hind wing 31-32 mm

Resembles the male, except the following features. Labium yellow, with black middle lobe; labrum yellow; bases of vescicle dark brown. Prothorax and thorax yellow, black marking divides the prothoracic lobes, thorax with black sutures and brown ventrolateral border. Legs black; bases of wing brownish yellow as far as the first antenodal in forewing while the mark reaches up to the tornus of the hindwing.

Indothemis limbata sita Campion

Material examined : Orissa, Bolangir. 1♂ 11.xi.1972.

Distribution : *Present record* : Orissa. *Past record* : *Western India* : Western India (Fraser 1936a).

Elsewhere : Sri Lanka (Fraser 1936a; Tsuda 1991).

Indothemis carnatica (Fabricius) (Fig. 162)

Libellula carnatica Fabricius, 1798, *Ent. Syst. Suppl.* p. 284.

Indothemis caesia, Fraser, 1936, *Fauna Brit. India, Odon.* 3 : 341-342.

Indothemis carnatica, Tsuda, 1991, *A distributional list of World Odonata, 1991*, p. 157.

Material examined : West Bengal : Purulia (333a) 1♂, 1.xii.1986.

Distribution : *Present record* : West Bengal. *Past record* : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1936a), *Southern India* : Nilgiris (Fraser 1936a); *Western India* : Bombay (Fraser 1936a).

Elsewhere : ASIA : Sri Lanka, Thailand (Tsuda 1991).

Genus *Crocothemis* Brauer

Crocothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* 18 : 367; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 343; Lieftinck, 1954, *Treubia* 22 (suppl.) : 148; Daives, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species : *Libellula servilia* Drury

Distribution : India, Nepal, Bangladesh, China, Burma, Sri Lanka, Thailand, Malayasia, Indonesia, New Guinea, Japan, Taiwan, Philippines, Australia, Iran, Iraq, Europe, Africa, Madagascar, America.

Crocothemis servilia servilia (Drury) (Fig. 158)

Libellula servilia Drury, 1770, *Ill. Exotic Ins.* **1** : 112-113. *Crocothemis servilia* Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 737.

Crocothemis servilia servilia Fraser, 1936, *Fauna Brit. India. Odon.* 3 : 345-347.

Material examined : Arunachal Pradesh : Bhalukpong (32) 1♂, 23.iii.1973; Kameng (231) 1♀, 4.v.1966; Lakhimpur (North) (176) 1♂, 6.x.1966; Siang (76) 1♂, 12.x.1966; (268) 1♀, 14.x.1966; (220) 1♀, 20.x.1966; (280) 1♂, 23.x.1966; (19) 1♂, 2♀, 30.x.1966; (44) 3♀, 31.x.1966; Subansiri (294) 2♀, 13.v.1966; 1♀, 8.x.1966; (80) 4♀, 26.x.1966; (28) 1♀, 27.x.1966; 2♂, 28.x.1966; Tirap (285a) 1♂, 25.xi.1966; Assam : Barpeta (146) 1♀, 31.iii.1986; 2♀, 2.iv.1986; Bijani (36) 1♀, 2.xi.1974; (238) 1♂, 2♀, 27.v.1979; (98) 1♂, 29.v.1979; Goalpara (235) 1♀, 11.xi.1974; Gossaigaon (118) 1♂, 18.vi.1973; (145) 1♂, 23.xii.1973 Kaziranga (156) 1♂, 2.xi.1974; 1♂, 5.xi.1974; Nowgong (219) 1♀, 4.xi.1974 (36) 1♀, 12.xi.1974; Silchar (97) 1♂, 2♀, 29.v.1979; (82) 2♂, 1♀, 29.v.1979; Bihar : Hazaribagh (126) 1♀, 31.x.1974; Palamau (191) 1♂, 12.xi.1974; Singhbhum (24) 1♀, 4.xii.1974; Manipur : Bishenpur (38) 1♀, 22.xi.1983; Chura Chandpur (73a) 1♂, 20.xi.1983; Imphal (130) 1♂, 6.x.1975; Ithai village (130a) 1♂, 1♀, 29.v.1974; Lok tak Lake (180) 21♂, 5♀, 19.ix.1975; (196) 1♀, 16.x.1975; Moco (North) (201) 3♂, 2♀, 14.ix.1975; Moirang (202) 4♂, 3♀, 13.xi.1983; (196) 1♂, 2♀, 16.ix.1975; New Chura Chandpur (46) 2♂, 2♀, 18.ix.1975; 5♂, 6♀, 19.ix.1975; Ukhrul (292) 2♀, 15.ix.1975; 1♂, 2.x.1975; 1♂, 1♀, 17.xi.1983; 1♀, 18.xi.1983; Mizoram : Blue mountain (38c) 2♂, 1♀, 16.i.87; 2♂, 22.i.87; Nagaland : Botsa (41) 3♀, 30.xi.1983; Kohima (169) 3♂, 2♀, 16.vii.1968; 1♂, 2♀, 28.xi.1983; Orissa : Anugul (7) 1♀, 30.ix.1972; 1♂, 1.x.1972; Bolangir (38b) 3♂, 16.xi.1972; Chilka (67) 1♂, 18.iii.1974; 1♀, 17.vi.1986; Cuttack (74) 1♀, 27.x.1971; 1♀, 3.xi.1971; Dhenkanal (88) 1♀, 7.x.1972; Kalahandi (147) 1♀, 8.xii.1973; Keonjhargarh (159a) 1♂, 2♀, 26.ix.1972; Koraput (168) 1♀, 24.xi.1973; 1♂, 26.xi.1973; Sundergarh (275) 1♀, 17.ix.1972; 1♂, 1972; 2♀, 24.iii.1973; Sikkim : Chulung (72) 2♂, 20.x.1977; Geyzing (110) 1♀, 6.xi.1977; Gangtak (103) 1♀, 27.x.1977; 1♂, 2.xi.1977; Kabi (144) 1♂, 19.x.1977; Nayabazar (213) 5♂, 30.x.1977; Tripura : Agartala (236) 4♂, 3♀, 30.x.1974; (31) 2♂, 6♀, 31.x.1974; (195) 4♂, 1♀, 1.xi.1974; (33) 1♂, 1♀, 2.xi.1974; Ambassa (152) 1♂, 20.xi.1967; Teliamura (43) 1♀, 10.xi.1974; (170) 1♂, 1♀ 12.xi.1974; (57) 1♂, 23.xi.1977; West Bengal : Bankura (38a) 1♂, 1♀, 4.viii.1974; Birbhum (255) 1♂, 11.ix.1974;

1♀, 13.ix.1974; 1♂, 14.ix.1974; (185) 1♀, 7.x.1974; (236) 2♀, 8.x.1974; (260) 1♂, 3♀, 9.x.1974; Calcutta 1♂, 1♀, 2.x.1966, 5♂, 1♀, 8.x.1966; 1♂, 1♀, 28.x.1966; 2♂, 26.ii.1967; 1♂, 2♀, 5.iii.1967; 1♀, 11.iii.1967; 1♂, 9.iv.1967; 3♂, 13.v.1967; 1♂, 16.vi.1967; 1♂, 7.vii.1967; 1♂, 16.vii.1967; 1♂, 23.vii.1967; Darjeeling (266) 1♂, 1♀, 17.iv.1973; 1♂, 1♀, 18.iv.1973; (155) 1♂, 1♀, 19.iv.1973; (266) 1♂, 23.iv.1973; (113) 1♀, 5.i.1974; (214) 1♂, 2♀, 7.i.1974; 24 Parganas (209a) 1♂, 7.viii.1966; (124) 1♀, 17.viii.1973; (24a) 1♂, 7.ix.1974; 1♂, 1♀, 5.xi.1983; Jalpaiguri (49) 1♂, 2♀, 25.xii.1984.

Distribution: *Present records*: Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal. *Past records*: INDIA: *Eastern India*: Assam, Arunachal Pradesh, Manipur, Mizoram (Lahiri 1979); Shillong (Pinhey 1979a) Pusa, Singhbhum (Bhasin 1953); Barkuda Island (Fraser & Dover 1922): Bengal (Selys 1891); Kohima (Lahiri *et. al.* 1970a). *Northern India*: Uttar Pradesh (Kumar 1982; Ram *et. al.* 1983); Garhwall Hills (Prasad 1974), Kangra (Prasad 1976) Chandanpur, Dehra Dun, Gonda, Gorakhpur, Mothronwala, Ramgarh, Saharanpur (Bhasin 1953); Doon Valley (Singh & Prasad 1976b): *Western India*: Bombay, Khandala, Poona (Fraser 1924b); Maharashtra (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1984). *Central India*: Gwalior, Saugor (Baijal & Agarwal 1955) Chhindwara (Mitra 1988); Bastar (Prasad 1996a). *Southern India*: Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Silent Valley (Rao & Lahiri 1983); Andhra Pradesh (Joseph & Satyarani 1988). Little Andaman (Lahiri 1998).

Elsewhere: ASIA: Burma (Fraser 1919d); Bhamo, Shesgaoo, Sumatra, Toungoo (Selys 1891); Basara (Fraser 1919d); Rockhampton (Brauer 1869); China (Needham 1930; Lohman 1981); Formosa (Needham 1930); Iraq (Bhasin 1953); Japan (Selys 1891). Malayasia (Brooks 1981, Lieftinck 1954); Nepal (Kiauta & Kiauta 1982a, St. Quentin 1970); Singapore (Kiauta & Kiauta 1982b); Thailand (Kiauta & Kiauta 1983b); Titayavan 1979); Yunnan (Moore 1878); Philippines (Kiauta & Kiauta 1983a) Korea, Laos, Singapore, Thailand, Taiwan (Tsuda 1991). AMERICA: Florida (Pulson 1978a, b); AFRICA: Suez (Fraser 1919c) EUROPE: Turkey (Schneider 1985a).

Intraspecific variations: One male specimen from the Andaman Island and five male (5♂) and one female (1♀) specimens from Rajasthan agree with specimens under study; but the basal marking of hindwing of 3♂, from Madhya Pradesh is less extent than that of specimens from the eastern India. In several specimens from the eastern India Cu_2 in the hind wing is slightly separated from the posterior angle of the discoidal cell; Lahiri *et. al.* (1970a) recorded a mixture of complete and incomplete distal antenodals in some specimens from Nagaland.

Note on taxonomic status of *Crocothemis indica* Sahni

Sahni (1964) described *Crocothemis indica* from Nainital on the basis of male examples. Lahiri *et. al.* (1972) described the female of the species. Further study reveals that *Crocothemis indica* is a synonym of *Crocothemis servilia servilia* (Drury).

Note on taxonomic status of *Crocothemis misrai* Baijal and Agarwal

Baijal and Agarwal (1955) described *Crocothemis misrai* from Saugor (M.P.) Study of the type material present in Zoological Survey of India, Calcutta, reveals that it is nothing but *Trithemis aurora* (Burm.)

Genus ***Bradinopyga*** Kirby

Bradinopyga Kirby, 1893, *J. Linn. Sci. Zool.* **24**: 558; Fraser, 1936, *Fauna Brit. India Odon.* **3**: 348: Davies, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species: *Libellula geminata* Rambur

Distribution: India, Africa, Burma, Thailand.

Bradinopyga geminata (Rambur) (Figs. 150, 197)

Libellula geminata Rambur, 1842, *Ins. Nevrop.* p. 90

Bradinopyga geminata Ris, 1911, *Cat. Coll. Selys, Lib.* fasc. **13** : 545. Fraser, 1936, *Fauna Brit. India. Odon* **3** : 349-350.

Material examined : Bihar : Hazaribagh (126) 1♀, 28.x.1974; 1♂, 28.vi.1975. Orissa : Bolangir (38b) 1♂, 10.xi.1972; Puri (233) 1♂, 2.ix.1972. Tripura : Ambassa 1♀, 16.xi.1974; West Bengal; Birbhum 1♂, 1♀, 9.x.1974; Calcutta 2♂, 2.x.1966; 1♀, 11.iii.1967; 2♂, 7.iv.1967; 1♂, 1♀, 15.iv.1967; 1♂, 21.v.1967; 1♂, 2.viii.1967; Howrah 1♀, 6.x.1974; Kochbehar 1♀, 2.ix.1983; 24 Parganas 1♂, 7.ix.1974.

Distribution : *Present records* : Bihar, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Midnapore (Dasgupta 1957); *Northern India* : Nainital (Sahni 1964); New Delhi (Baijal & Agarwal 1955) Doon Valley (Singh & Prasad 1976b), Rajasthan (Prasad & Thakur 1981) *Central India* : Gwalior (Baijal & Agarwal 1955); Nagpur (Mitra 1988); Bastar (Prasad 1996a). *Western India* : Poona, Khandala, (Fraser 1924b); Maharashtra (Kalaskar & Kalaskar 1998). *Southern India* : Bolovumpattis, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Andhra Pradesh (Joseph & Satyarani 1988).

Elsewhere : ASIA : Thailand (Kiauta & Kiauta 1983b, Titayavan 1979) Sri Lanka (Tsuda 1991).

Remark : A new record from Tripura (Mitra 1994).

Intraspecific variations : One male specimen from Maharashtra agrees with specimens under study but both vary from Fraser's (1936a) description in having membrane brown; antenodals in forewing $10\frac{1}{2}$-$11\frac{1}{2}$; in hindwing 9-10; post nodals in forewing 8-10; in hindwing 8-9.

Taxonomic status of *Bradinopyga saint-johanni* Baijal & Agarwal

Baijal & Agarwal (1955) described *Bradinopyga saint-johanni* from Agra, Uttar Pradesh, examination of the type material deposited in the collection of Zoological Survey of India, Calcutta, reveals that it is nothing but *Bradinopyga geminata* (Rambur).

Genus ***Brachythemis*** Brauer

Brachythemis, Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 367; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 363; Lieftinck, 1954, *Treubia* 22 (suppl.) : 153; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 46.

Type-species : *Libellula contaminata* Fabricius

Distribution : India, Nepal, China, Sri Lanka, Burma, Thailand, Indonesia, Taiwan, Philippines, Celebes, Iraq, Africa, Italy.

Brachythemis contaminata (Fabricius) (Fig. 200)

Libellula contaminata Fabricius, 1793, *Ent. Syst.* 2 : 382.

Brachythemis contaminata, Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 736, Fraser, 1936, *Fauna Brit. India Odon.* **3** : 365-366; Lieftinck, 1954, *Treubia* **22** (suppl.) : 153.

Material examined : Assam : Barpeta (146) 1♂, 2.iv.1986; Goalpara (132) 2♂, 3♀, 5.vi.1973; (45) 2♀, 23.xii.1973; Silchar (238) 2♂, 27.v.1979; Tejpur (282) 1♀, 3.iii.1973; Bihar : Hazaribagh (126) 1♂, 29.x.1974; 1♂, 27.vi.1975; Palamau (222) 1♀, 7.xi.1974; 1♂, 2.vii.1975; 1♀, 3.viii.1975; 1♂, 20.vi.1983; Manipur : Moirang (202) 1♀, 29.v.1974; Orissa : Bangriposi (19a) 1♂, 17.ix.1972; Bolangir (38b) 1♂, 1.x.1972; 2♀, 21.vi.1986; Chilka (67) 2♂, 1♀, 17.vi.1986; Keonjhargarh (159) 1♂, 20.ix.1972; Puri (233) 1♀, 26.iii.1974; Sundergarh (275) 2♀, 26.x.1973, 6♂, 28.x.1972; Tripura : Agartala (2) 1♂, 9.xi.1969; 2♂, 4.xi.1970; 1♂, 5.xi.1970; (232) 1♂, 29.x.1974; (2) 1♂, 2.x.1974; Manu (83) 2♀, 24.xi.1974; Teliamura (101) 1♂, 13.xi.1974; Udaipur (106) 2♂, 2♀, 7.xi.1974. West Bengal : Bankura (65) 4♂, 31.vii.1974; (21) 1♂, 3♀, 1.viii.1974; (139) 1♂, 3.viii.1974; (38a) 1♂, 1♀, 4.vii.1974;

Birbhum (236) 2♂, 2♀, 11.ix.1974; Calcutta (52) 2♀, 7.ix.1966; 1♂, 1♀, 11.ix.1966; 1♀, 18.ix.1966; 1♀, 22.ix.1966; 3♀, 9.x.1966; 2♂, 1♀, 5.iii.1967; 2♂, 3♀, 11.iii.1967; 2♂, 27.viii.1967; Darjeeling (149) 9♀, 3.1.1974; Howrah (120a) 2♂, 6.x.1974; 24 Parganas (209a) 1♂, 1♀, 7.viii.1966; (209) 3♂, 12.x.1974; 1♀, 13.xi.1983; Malda (186a) 1♂, 1♀, 13.x.1988.

Distribution : *Present records* : Assam, Bihar, Manipur, Orissa, Tripura, West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Sadiya (Laidlaw 1914); Gauhati (Fraser 1921a); Calcutta (Dasgupta 1957); Barkuda Island (Fraser & Dover 1922); *Northern India* : Uttar Pradesh (Ram *et. al.* 1982); Agra (Baijal & Agarwal 1955); Doon Valley (Singh & Prasad 1976b); Garhwal Hills (Prasad 1974); Kangra (Prasad 1976b). *Central India* : Gwalior (Baijal & Agarwal 1955); Bastar (Prasad 1996a). *Western India* : Poona, Khandala (Fraser 1924b), Maharashtra (Kalaskar & Kalaskar 1998); Gujarat (Prasad 1984); Goa (Prasad 1995). *Southern India* : Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); Tamil Nadu (Kumar 1990); Andhra Pradesh (Joseph & Satyarani 1988). Nicobar Island (Lahiri & Mitra 1993).

Elsewhere : ASIA : Bangladesh, Chittagong (Chowdhury & Akhteruzzaman 1981); Bhamo, Burma, Mandalaya, Toungoo (Selys 1891); China, Ceylon (Lieftinck 1971b); Indo-China, Malaya Peninsula (Fraser 1919e); Nepal (Kiauta 1975, St. Quentin 1970); Philippines, Taiwan (Lieftinck 1971b). Hongkong, Japan, Laos, Malayasia, Singapore, Thailand, Vietnam (Tsuda 1991).

Intraspecific variations : Specimens do not depict regional features among themselves. But they differ from Fraser's (1936a) description since their frons are light brown to dark brown; labrum brownish olivaceous; thorax olivaceous yellow or brown; legs yellow to brown; abdominal segments 3-4 with blackish-green at the ventrolateral surface; an olivaceous mark at the base of the 10th segment; anal appendages yellow; or reddish yellow; in female the distal half of the labrum light brown, legs brown, base of the abdomen pale blue and brown at the apex. One male (1♂) specimen from Rajasthan differs from the eastern Indian specimens since it lacks the humeral stripe.

Genus ***Neurothemis*** Brauer

Neurothemis Brauer, 1867, *Verh. zool.-bot. Ges. Wien.* **17** : 6; Ris, 1911, *Cat. Coll. Selys* fasc. **13** : 548-553; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 350; Lieftinck, 1954, *Treubia* **22** (suppl.) : 149; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 47.

Type-species : *Libellula fulvia* Drury

Distribution : India, Nepal, Tibet, China, Bangladesh, Sri Lanka, Nicobar, Burma, thailand, Vietnam, Malayasia, Indonesia, New Guinea, Japan, Taiwan, Philippines, Australia, Pacific Islands.

Key to Species of Genus *Neurothemis* Brauer

1. Antenodals in forewing more than 30 .... *fulvia* (Drury)
- Antenodals in forewing less than 30 2
2. Antenodals in forewing more than 11 .. 3
- Antenodals in forewing less than 11 .... *tullia tullia* (Drury)
3. Basal reticulation dense .... *fluctualns* (Fabr.)
- Basal reticulation less dense 4
4. Distinct humeral stripe .... *intermedia intermedia* (Rambur)
- Humeral stripe almost absent .... *intermedia atalanta* Ris

Neurothemis fulvia (Drury)
(Fig. 167)

Libellula fulvia Drury, 1773, *Ill. Exot. Ins.* **2** : 84.

Libellula sophronia Drury, 1773, *Ill. Exot. Ins.* **2** : 86.

Neurothemis fulvia, Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 271; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 353-354; Lieftinck, 1954, *Treubia* **22** (suppl.) : 150.

Material examined : Arunachal Pradesh : North Lakhimpur (100a) 1♂, 4.x.1966; Subansiri (80) 1♀, 28.x.1966; Tirap (87) 1♀, 11.xi.1971; Assam : Goalpara (217) 1♀, 25.v.1973; (235) 3♂, 13.vi.1973; 1♀, 16.vi.1973; 2♂, 4.xi.1974; (132) 1♂, 14.xii.1973; (235) 1♀, 20.xii.1973; 1♀, 11.xi.1974; (118) 1♂, 2♀, 8.ix.1974; 1♀, 15.ix.1974; Mikir Hill (200) 3♂, 2♀, 3.xi.1974; Silchar 1♀, 7.xii.1983; (238) 1♀, 27.v.1979; Manipur : Mao (270) 1♀, 13.ix.1975; Morch (205) 1♂, 22.ii.1975; 1♂, 24.xi.1983; 2♂, 2♀, 25.xi.1983; Morch west : 1♂, 4♀, 27.ix.1975; New Chura Chandpur (46) 1♂, 19.ix.1975; Mizoram : Terei (281b) 1♀, 22.x.1991; Nagaland : Mokokchung 1♂, 1♀, 18-19.ix.1994; Orissa : Puri (233) 1♂, 9.i.1974; Rampur (233) 1♀, 10.xii.1973; Tripura : Agartala (2) 3♀, 30.x.1974; Ambassa (5) 22♂, 11♀, 16.xi.1974; 1♀, 17.xi.1974; (93) 1♂, 18.xi.1974; (121) 3♀, 19.xi.1974; (152) 1♂, 1♀, 20.xi.1974; Belonia (28a) 1♂, 29.ix.1977; (20) 1♂, 1♀, 2.x.1977; Bishalgarh (37) 1♀, 20.xi.1969; Panalia (225) 1♀, 10.x.1977; Teliamura (43) 4♀, 10.x.1974; (101) 1♂, 2♀, 12.xi.1974; (102) 1♀, 19.x.1977; Udaipur (106) 1♀, 4.xi.1974; 5♀, 5.xi.1974; West Bengal : Darjeeling (245) 3♂, 7.iv.1973; 1♂, 10.iv.1973; 1♂, 15.iv.1973; Jalpaiguri (248) 1♂, 9.ix.1975; 1♀, 12.ix.1975; (49) 1♂, 23.xii.1984; 24 Parganas (10b) 1♂, 19.ix.1983.

Distribution : *Present records* : Arunachal Pradesh, Assam, Manipur, Mizoram Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur, Dibrugarh, N.E. Assam (Laidlaw 1914); Assam, Manipur (Lahiri 1979); Sibsagar, Buxa, Singhbhum (Bhasin 1953) Meghalaya (Lahiri 1987); *Central India* : Saugor, (Baijal & Agarwal 1955); Bastar (Prasad 1996a). *Southern India* : Annaimalai, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Travancore (Fraser 1931a). Silent Valley (Rao & Lahiri 1983); Calicut (Selys 1891) : *Western India* : Bombay, Poona (Bhasin 1953). *Northern India* : Doon Valley (Singh & Prasad 1976b).

Elsewhere : ASIA : Bangladesh, Sylhet, Burma, Bhamo, Palon, Teinzo, (Selys 1891); China (Klots 1947; Needham 1930) Malayasia (Brooks 1981; Lieftinck 1948; 1954); Nepal (Asahina 1955; Kiauta 1975; St. Quentin 1970). Taiwan (Lieftinck *et. al.* 1984), Hong Kong, Indonesia, Kampuchia, Laos, Thailand (Tsuda 1991).

Intraspecific variation : Specimens from Darjeeling vary from specimens from Assam valley, Purvanchal and Orissa highland in having labium pale yellow in contrast with pale olivaceous labium in Assam and Purvanchal forms; bluish yellow in Orissa specimens.

Neurothemis fluctuans (Fabricius)

Libellula fluctuans Fabricius, 1793. *Ent. Syst.*, **2** : 379.

Neurothemis fluctuans Hagen, 1869, *Stett. Ent. Zeit.* **30** : 105; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 355-356; Lieftinck, 1954, *Treubia* **22** (suppl.) : 149.

Material examined : Assam : Goalpara (132) 1♂, 4.vi.1973. Mizoram : Terei (281b) 1♂, 4♀, 25.x.1991.

Distribution : *Present record* : Assam, Mizoram. *Past records* : INDIA : *Eastern India* : Lakhimpur (Bhasin 1953); Nicobar Island (Selys 1891); Andamans (Lahiri 1998)

Elsewhere : ASIA : Burma, Tennasserim, Teinzo, Tourngoo; Borneo, China, Sanghai, Java, Singapore, Sumatra (Selys 1891); Malacca; Siam (Fraser 1936a); Malayasia (Brooks 1981; Lieftinck 1948). Indonesia, Kampuchea, Laos, Singapore, Thailand (Tsuda 1991).

Remark : Addition to the fauna of Assam and Mizoram (Mitra 1994).

Neurothemis intermedia intermedia (Rambur) (Fig. 168)

Libellula intermedia Rambur, 1842, *Ins. Nevrop.* p. 91.

Neurothemis intermedia, Selys, 1889, *Ann. Mus. Civ. Genova* **27** : 454.

Neurothemis intermedia intermedia Ris., 1911, *Cat. Coll. Selys* fasc. **13** : 551; Fraser, 1936, *Fauna Brit. India. Odon* 3 : 357-358. Lieftinck, 1954, *Treubia* **22** (suppl.) : 150.

Material examined : Arunachal Pradesh : Lohitpur (179) 3♀, 13.iii.1969; Tirap (87) 1♂, 1♀, 11.xi.1971; Assam : Cachar (51) 2♀, 5.xii.1983; Dallo (77) 1♂, 4♀, 17.x.1974; Dhubri (89) 5♂, 10.xi.1974; Goalpara (235) 1♂, 5.vi.1973; (145) 2♂, 4♀, 8.xii.1973; 2♂, 2♀, 10.xii.1973; (132) 1♂, 13.xii.1973; 1♂, 14.xii.1973; 1♂, 16.xii.1973 (118) 2♀, 8.xi.1975; Mikir Hills (200) 2♂, 4♀, 3.xi.1974; (40) 1♂, 2♀, 9.xi.1974; Nissangaon (217) 1♀, 12.v.1973; Silchar 1♀, 4.xii.1983; Bihar : Hazaribagh (126) 1♂, 5♀, 2.xi.1974; Singhbhum (24) 1♂, 4.xii.1974; 1♂, 8.xii.1974; Manipur : Central district (186) 1♀, 12.ii.1975; Churachandpur (73a) 1♂, 20.xi.1983; Lamka (175) 1♂, 3♀, 21.xi.1983; Lok Tak Lake (180) 2♀, 20.ix.1975; Makur (186) 1♀, 12.ii.1975; Morch (204) 1♂, 1♀, 24.ii.1975; 1♂, 1♀, 24.xi.1983; Morch West 1♂, 25.ix.1975; Nampolong (212) 1♀, 25.ii.1975; Nagaland : Wokha 2♂, 25.i.1990, (Deposited in ERS. ZSI. Shillong) Orissa : Anugul (7) 1♀, 12.iv.1973; Joshipur (143) 1♂, 12.xi.1973; Keonjhargarh (159a) 1♂, 25.ix.1972; Koraput (168) 1♂, 2♀, 23.ii.1973; 1♀, 30.xi.1973; Mayurbhanj (264a) 2♂, 5.ii.1986; Phulbari (230) 5♂, 2♀, 13.x.1973; 1♂, 3♀, 13.xii.1973; 1♀, 17.xii.1973; Puri (233) 2♂, 2.i.1974; 2♀, 1.i.1974; Sundergarh (275) 1♀, 27.x.1972; Sikkim : Tumin (287a) 1♂, 29.ix.1988; Tripura : Agartala; 2♂, 1♀, 6.xi.1970; 1♂, 3♀, 7.xi.1970; 2♀, 11.xi.1970; 2♂, 30.x.1974; Ambassa (4) 1♂, 6.xi.1974; (5) 2♂, 3♀, 17.xi.1974; (189a) 1♀, 19.xi.1974; 2♂, 20.xi.1974; 1♀, 26.x.1977; Belonia (28a) 1♀, 1.x.1977; Hathalia (125) 1♂, 1♀, 5.xii.1969; Kailashpur (148) 2♂, 2.xi.1977; Teliamura (43) 6♂, 6♀, 10.xi.1974; (101) 2♂, 2♀, 12.xi.1974; (170) 1♀, 13.xi.1974; (172a) 7♂, 9♀, 14.xi.1974; 1♂, 16.xi.1974; 1♂, 4♀, 19.xi.1974; (152) 1♂, 1♀, 20.xi.1974; Udaipur 1♀, 28.xi.1969; 1♂, 1.xii.1969; 4♂, 1♀, 4.xi.1974; (289a) 1♂, 5.xi.1974; (106) 1♀, 7.xi.1974; 1♂, 1♀, 8.xi.1974; West Bengal : Bankura (21) 1♀, 31.vii.1974; Darjeeling (245) 1♂, 31.iii.1973; (246a) 1♂, 1♀, 1.iv.1973; (149) 1♂, 1♀, 3.iv.1973; (266) 1♀, 7.iv.1973; (34) 1♀, 9.xii.1973; (109) 1♀, 20.xii.1973; 1♂, 22.xii.1973; (162) 2♂, 1♀, 23.xii.1973; 1♂, 1♀, 25.xii.1973; 1♀, 3.i.1974; (113) 1♂, 1♀, 5.i.1974; (238) 1♀, 6.i.1974; (214) 1♂, 1♀, 7.i.1974 (245) 1♂, 8.i.1974; 1♂, 1♀, 29.v.1974; (289) 13♂, 16♀, 29.xii.1975; Jalpaiguri (49) : 4♂, 2♀, 25.xii.1984.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Nagaland, Orissa, Sikkim, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : Assam, Arunachal Pradesh, Mizoram, (Lahiri 1979); Meghalaya (Lahiri 1987); Sikkim (Lieftinck 1948); Buxa, Singhbhum (Bhasin 1953); *Northern India* : Chandanpur, Gorakhpur, Surpur (Bhasin 1953); Doon Valley (Singh & Prasad 1976b); Kangra (Prasad 1976); *Western India* : Bombay, Khandala, Poona, (Fraser 1924b); Maharashtra (Kalaskar & Kalaskar 1998); *Southern India* : Annaimalai, Coorg, Deccan, Kanara, Malabar, Nilgiris, (Fraser 1931a). Silent Valley (Rao & Lahiri 1983); Andhra Pradesh (Joseph & Satyarani 1988). *Central India* : Chhindwara (Mitra, 1988); Bastar (Prasad 1996a).

Elsewhere : ASIA : Burma, Ceylon (Fraser 1919d; Lieftinck 1971b) Nepal (Kiauta 1975, St. Quentin 1970). Bangladesh, China, Thailand (Tsuda 1991).

Remark : New record from Manipur, Orissa, Tripura, West Bengal (Mitra 1994).

Intraspecific variation : The specimens vary from Fraser's (1936a) description in following aspects : In the female specimens from Darjeeling and Tripura the dark spots on the abdominal segments faint while in female from Assam it is distinct. The females from Darjeeling possess bluish yellow labium, labrum and frons along with the bases of mandibles. In Tripura form the yellow colouration of the forewing extends up to the subcostal space; while in the specimens

from Bihar yellow basal marking in the wings extends beyond the discoidal cell. The male specimens agree with a male example from Madhya Pradesh.

Neurothemis intermedia atalanta Ris (Fig. 169)

Neurothemis intermedia atalanta Ris, 1916, *Cat. Coll. Selys*, fasc. **16** : 1168; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 358-359.

Material examined : Assam : Barpeta (92) 2♂, 5♀, 10.iv.1986; Orissa : Sambalpur (252) 1♂, 27.x.1973; 1♂, 1♀, 7.xi.1972.

Distribution : *Present records* : Assam, Orissa. *Past records* : INDIA : *Eastern India* : Lakhimpur, U. dihing, Sibsagar (Bhasin 1953); Sikkim (Fraser 1936a); Tripura (Lahiri 1977; Mitra & Sen (1975); Meghalaya (Lahiri 1987). *Southern India* : Palghat, Nilgiri, Wynaad (Fraser 1936a).

Elsewhere : ASIA : Burma, Siam (Fraser 1936a); Nepal (St. Quentin 1970). Kampuchea, Thailand (Tsuda 1991).

Remark : A new record from Orissa (Mitra 1994).

Intraspecific variation : The specimens have following nodal indices : Antenodal in forewing 11½-13½; hindwing 9-10; Post nodals in forewing 11-12 hindwing 10.

Neurothemis tullia tullia (Drury)

Libellula tullia Drury, *Ill. Exot. Ins.* **2** : 85.

Neurothemis tullia, Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 8.

Neurothemis tullia tullia, Ris, 1911, *Cat. Coll. Selys*, fasc. **13** : 551; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 360-362; Lieftinck, 1954, *Treubia* **22** (suppl.) : 153.

Material examined : Arunachal Pradesh : Tirap 1♂, 27.x.1971; Assam : Barpeta (92) 1♀, 2.iv.1986; Kaziranga (156) 2♀, 29.xi.1969; Nagaland : Dimapur 2♂, 3♀, 17.ix.1994; Orissa : Cuttack (74) 1♂, 1♀, 3.xi.1971; 1♂, 1♀, 24.iii.1974; Puri (233) 1♂, 24.iii.1974; Tripura : Agartala (2) 1♀, 30.x.1974; Ambassa (152) 1♂, 20.xi.1974; Sheikbari (261) 1♂, 13.xii.1969; Udaipur (106) 1♂, 1♀, 8.xi.1974; West Bengal : Bankura (65) 1♂, 31.vii.1974; Birbhum (271) 7♂, 1♀, 12.ix.1974; 1♂, 6.x.1974; (260) 2♂, 2♀, 9.x.1974; Calcutta 5♂, 2.x.1966; 1♂, 23.x.1966; 1♀, 4.xi.1967; 1♀, 4.vi.1967; 24 Parganas : (24a) 3♂, 7.ix.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Nagaland, Orissa, Tripura and West Bengal. *Past records* : INDIA : *Eastern India* : North Lakhimpur (Laidlaw 1914) Bengal (Selys 1891); Barkuda Island (Fraser & Dover 1922); Tripura (Lahiri 1977a); Assam (Lahiri 1979); Pusa (Bhasin 1953) Meghalaya (Lahiri 1987); Meghalaya (abnormal form : Prasad 1997a). *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Bharatpur (Baijal & Agarwal 1955); Doon Valley (Singh & Prasad 1976); Kangra (Prasad 1976); *Southern India* : Bangalore, Madras, Nilgiris, (Fraser 1919d); Coorg, Coimbatore, Kallar, Nilgiris, Wynaad (Fraser 1924b); Silent Valley (Rao & Lahiri 1983); Tamil Nadu (Kumar 1990); Andhra Pradesh (Jospesh & Satyarani 1988). *Western India* : Bombay, Elephanta Island (Fraser 1919d); Maharashtra (Kalaskar & Kalaskar 1998). *Central India* : Bhandara (Bhasin 1953); Bastar (Prasad 1996a).

Elsewhere : ASIA : Burma, Bhamo, Teinzo, Bangladesh, Sylhet, Tibet, China (Selys 1891); Hainan (Needham 1930; Selys 1891); Indo-China (Lieftinck 1948); Thailand (Lieftinck 1971b); China (Rowe 1981, Selys 1891); Taiwan (Lieftinck *et. al.* 1984). Hong Kong, Sri Lanka, Malayasia (Tsuda 1991).

Intraspecific variation : The male specimen from Arunachal Pradesh varies from males of other localities in having labium brownish black, while the males of Assam, Orissa, Tripura and West Bengal have labrum, face, frons, prothorax and thorax deep brown, the yellow stripe on the mid-dorsal carina or thorax indistinct; cream white spot on abdomen absent; anal appendages brownish. In female specimens the amber yellow colour of the fore-wing terminates to one or two

cells prior to node; in the hind wing the colour reaches up to the level of the node or one cell proximal to node; the blackish brown marking on the wings originate from the level of the first antenodal nervure; the yellow stripe of the abdomen extends upto the 5th abdominal segment.

Genus ***Sympetrum*** Newman

Sympetrum Newman, 1833, *Ent. Mag.* **1**: 511; Kirby, 1889, *Trans. Zool. Soc. Lond.* **12**: 263; Fraser, 1936, *Fauna Brit. India. Odon.* **3**: 370; Davies, 1981, *Symop. Ext. Gen. Odon.* p. 48.

Type-species: *Libellula vulgata* Linn.

Distribution: Cosmopolitan.

Sympetrum hypomelas (Selys) (Fig. 175)

Diplax hypomelas Selys, 1884, *Ann. Soc. Ent. Belg.* **28**: 37.

Sympetrum hypomelas Kirby, 1890, *Syn. Cat. Nour. Odon.* p. 16; Fraser, 1936, *Fauna Brit. India. Odon.* **3**: 373-374.

Material examined: Bihar: Palamau (222) 1♂, 20.vi.1983; Manipur: Mao (196) 11♂, 16.ix.1975; New Chura Chandpur (216) 2♂, 3♀, 18.ix.1975; Sansang area (270) 3♀, 3.ix.1975; 2♀, 13.ix.1975; Ukhrul (129) 1♀, 1.x.1975, 1♂, 1♀, 2.x.1975; Mizoram; Champhai (57b) 1♂, 31.x.1991; Sikkim: Chungthang (73) 1♂, 11.viii.1979; Tumin 4♂, 2♀, 29.ix.1988.

Distribution: *Present records*: Bihar, Manipur, Mizoram Sikkim. *Past records*: INDIA: *Eastern India*: Arunachal Pradesh (Lahiri 1979) Assam, Bengal, Khasia Hills, Sikkim (Fraser 1919d).

Elsewhere: ASIA: Burma (Fraser 1935): Burma, Cobapo, Puepoli (Selys 1891); Nepal (St. Quentin 1970); Tibet (Fraser 1919d) China (Needham 1930); Bangladesh (Tsuda 1991.

Remark: New record from Bihar, Manipur, Mizoram (Mitra 1994)

Intraspecific variation: The male specimens from Manipur, Mizoram and Sikkim vary from the specimens from Bihar, as well as Fraser's (1936a) description in having labium brownish yellow, borders of lateral lobe delicately black, labrum face and vesicle suffused with brownish red.

Genus ***Rhodothemis*** Ris

Rhodothemis Ris, 1909, *Cat. Coll. Selys.* fasc. **9**: 29: 1911, *Cat. Coll. Selys* fasc. **13**: 591-592; Fraser, 1936, *Fauna Brit. India, Odon.* **3**: 366; Lieftinck, 1954, *Treubia* **22** (suppl.): 154; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 48.

Type-species: *Libellula rufa* Rambur

Distribution: India, Sri Lanka, Burma, Malayasia, Sundaic Archipelago, Australia, New Guinea, Celebes, Borneo, Java.

Rhodothemis rufa (Rambur)

Libellula rufa Rambur, 1842, *Ins. Nevrop.* p. 71.

Rhodothemis rufa Ris, 1911, *Cat. Coll. Selys. Lib.* fasc. **13**: 592-593: Fraser, 1936, *Fauna Brit. India. Odon.* **3**: 368-369; Lieftinck, 1954, *Treubia* **22** (suppl.): 154.

Material examined: Manipur: Moirang (202) 1♂, 2♀, 29.v.1974.

Distribution: *Present record*: Manipur. *Past records*: INDIA: *Western India*: Bombay (Fraser 1924b): *Southern India*: Coorg, Deccan, Nilgiris (Fraser 1931a); Malabar, Palghat (Fraser 1924b); Andhra Pradesh (Joseph & Satyarani 1988).

Elsewhere: ASIA: Bangladesh, Chittagong (Chowdhury & Akhteruzzaman 1981); Burma (Lieftinck 1948), Bhamo, Mandalaya (Selys 1891); China (Needham 1930); Ceylon, Java, Malayasia (Fraser 1936a); Singapore (Kiauta & Kiauta 1982b). Celebes (Fraser 1936a; Selys 1891); New Guinea (Fraser 1936a); Thailand, Vietnam (Tsuda 1991).

Remark: New record from Eastern India (Mitra 1994).

Genus ***Trithemis*** Brauer

Trithemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18**: 176; Fraser, 1936, *Fauna Brit. India. Odon* **3**: 381; Lieftinck, 1954, *Treubia* **22** (suppl.); 155; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 49.

Type-species : *Libellula aurora* Burmeister

Distribution : India, Nepal, Tibet, China, Pakistan, Sri Lanka, Burma, Thailand, Vietnam, Malayasia, Indonesia, New Guinea, Taiwan, Philippines, Pacific Islands, Syria, Turkey, Mauretius, Africa, Madagascar.

Key to Species of Genus *Trithemis* Brauer

- Pterostigma bicolourous .... *pallidinervis* (Kirby)
- Pterostigma black .....*festiva* (Rambur)
- Pterostigma reddish brown..... ..... *aurora* (Burn.)

Trithemis aurora (Burmeister)
(Figs. 171, 172, 199)

Libellula aurora Burmeister, 1839, *Handb. Ent.* 2 : 859.

Trithemis aurora Brauer, 1868, *Verh. zool.-bot. Ges. Wien.* **18** : 177. Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 383-385; Lieftinck, 1954, *Treubia* **22** (suppl.) : 155.

Material examined : Arunachal Pradesh : Kameng (231) 2♂, 4.v.1966; Siang (176) 1♂, 2.x.1966; 1♂, 7.x.1966; 1♀, 12.x.1966; (95) 2♀, 22.x.1966; (263) 1♂, 8.x.1966; Tirap (212) 1♂, 25.x.1971; 1♂, 28.x.1971; (87) 2♂, 1♀, 9.xi.1971; 3♂, 10.xi.1971; 1♂, 11.xi.1971; Assam : Barpeta (146) 1♂, 2.iv.1986; 2♂, 28.iii.1986; Goalpara (145) 1♂, 25.v.1973; (132) 1♂, 2.vi.1973; 2♀, 3.vi.1973; 3♂, 4.vi.1973; 1♂, 6.vi.1973; (235) 1♂, 8.vi.1973; 1♂, 1♀, 9.vi.1973; 1♂, 1♀, 10.vi.1973; 2♀, 12.vi.1973; (235) 1♂, 13.vi.1973; 1♂, 17.vi.1973; Bihar : Hazaribagh (126) 2♂, 30.x.1974; 2♂, 2♀, 2.xi.1974; 1♀, 29.v.1975; Palamau (191) 1♀, 7.xi.1974; Singhbhum (24) 2♂, 8.xii.1974. Manipur : Mao (196) 1♂, 16.ix.1975; Morch 1♂, 5♀, 24.xi.1983; Mizoram : Champhai (57b) 1♂, 29.x.1991; Orissa : Sundergarh (275) 1♂, 17.x.1973; Sikkim : Jorethang (140) 1♀, 29.x.1977; Nayabazar (213) 1♀, 29.x.1977 1♂, 30.x.1977; Tripura : Ambassa (152) 1♂, 20.xi.1974; West Bengal : Darjeeling (214) 1♂, 7.i.1974.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Sikkim, Tripura, West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh, Assam, Manipur, Mizoram (Lahiri 1979); Darjeeling (St. Quentin 1936); Dejoo, North Lakhimpur, Sadiya, N.E. Assam (Laidlaw 1914); Buxa, Singhbhum (Bhasin 1953); Calcutta, Howrah, 24 Parganas districts (Ram *et. al.* 1982); Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Kumar 1982) Rajasthan (Bose & Mitra 1976); Dehra Dun, Nalapani (Bhasin 1953); Garhwal (Prasad 1974) Kangra (Prasad 1976). *Central India* : Balaghat, Bhandara (Bhasin 1953); Betul, Chhindwara (Mitra 1988); Bastar (Pradad 1996a); *Western India* : Bombay (Fraser 1919e). Bastar (Prasad 1996a). *Western India* : Gujarat (Prasad 1984); Maharashtra (Kalaskar & Kalaskar 1998). *Southern India* : Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kangra, Malabar, Nilgiris (Fraser 1931a). Madras (Fraser 1919f); Silent Valley (Rao & Lahiri 1983). Andamans (Lahiri 1998).

Elsewhere : ASIA : Bhamo, Palon, Teinzo, (Selys 1891); Ceylon (Lieftinck 1971b); China, Formosa (Needham 1930); Nepal (St. Quentin 1970); Malayasia (Brooks 1981; Lieftinck 1954); Pakistan, Karachi (Fraser 1919f); Philippines (Kiauta & Kiauta 1983a) Timor, Celebes (Lieftinck 1971b); Thailand (Titayavan 1979); Singapore (Kiauta & Kiauta 1982b). Taiwan (Lieftinck *et. al.* 1984); Hong Kong, Indonesia, Japan, Kampuchea, Laos, Singapore, Vietnam (Tsuda 1991).

Remark : New record from Sikkim and Tripura (Mitra 1994).

Intraspecific variation : 4♂, 7♀, specimens from Madhya Pradesh agreee with the specimens under study, 2♂, examples from the Andaman Islands and 1♂, example from Rajasthan vary from the specimens under study since they (Andaman & Rajasthan forms) lack black marking on labium and their labrum remains dark brown.

Trithemis festiva (Rambur)
(Fig. 170)

Libellula festiva Rambur, 1842, *Ins. Nevrop.* p. 92.

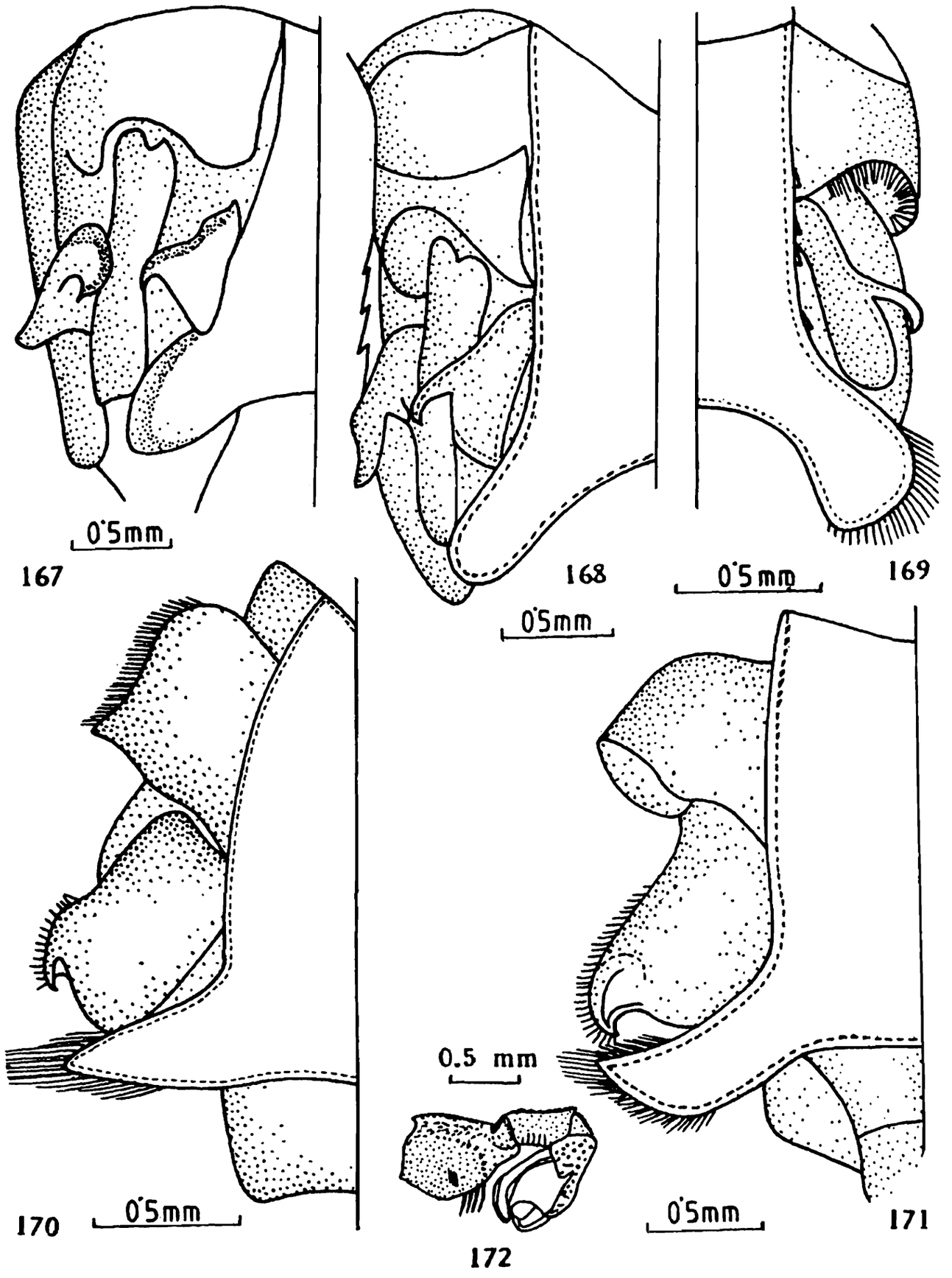


Fig. 167-172. 167. Genitalia of male *Neurothemis fulvia* (Drury); 168. Genitalia of male *Neurothemis i. intermedia* (Rambur); 169. Genitalia of male *Neurothemis i. atalanta* Ris.; 170. Genitalia of male *Trithemis festiva* Rambur; 171. Genitalia of male *Trithemis aurora* (Burmeister); 172. Penis of the same

Trithemis festiva, Brauer, 1868, *Verh. zoo.-bot. Ges. Wien.* **18** : 736. Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 387-389 : Lieftinck, 1954. *Treubia* **22** (suppl.) : 156.

Material examined : Arunachal Pradesh : Chandan Forest (60) 1♂, 24.iii.1973; Siang (263) 2♂, 8.x.1966; 1♂, 14.x.1966; Subansiri 1♂, 9.v.1966; Assam : Barpeta (3) 2♂, 4.iv.1986; 3♂, 6.iv.1986; 1♂, 7.iv.1986; Goalpara (132) 3♂, 1♀, 3.vi.1973; 1♂, 4.vi.1973; Bihar : Hazaribagh (126) 2♂, 2.xi.1974; Palamau (222) 1♂, 8.xi.1974; Singhbhum (24) 1♂, 4.xii.1974; Manipur; Mao (270) 1♂, 21.iii.1973; (264a) 2♂, 4.ii.1986; Tikarpara (284) 1♂, 24.i.1974; West Bengal : Darjeeling (246a) 1♂, 23.iii.1973.

Distribution : *Present records* : Arunachal Pradesh, Assam, Bihar, Manipur, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur, Upper Assam (Laidlaw 1914); Arunachal Pradesh, Manipur, Mizoram, (Lahiri 1979); Meghalaya (Lahiri 1987); *Northern India* : Almora, Bishanpur, Coonur, Dehra Dun, Mothronwala, Nalapani, Saharanpur (Bhasin 1953); Rajasthan (Prasad & Thakur 1981); Garhwal Hills (Prasad 1974); Kangra (Prasad 1976); *Southern India* : Annaimalai, Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palnis, Travancore (Fraser 1931a); Tamil Nadu (Kumar 1990). Andamans (Lahiri 1998). *Central India* : Bastar (Prasad 1996a). *Western India* : Maharashtra (Kalaskar & Kalaskar 1998).

Elsewhere : ASIA : Burma (Laidlaw 1914); Borneo, Ceylon, Formosa, Indo-China, (Fraser 1919f); Malayasia (Lieftinck 1954); Nepal (Asahina 1955; St. Quentin 1970); Philippines, Sumatra (Selys 1891); Afghanistan, Hong Kong, Iraq, Kampuchea, Laos, Singapore, Thailand, Vietnam (Tsuda 1991); Taiwan (Lieftinck *et. al.* 1984), New Guinea (Lieftinck 1971b).

Remark : New record from Bihar, Orissa, West Bengal (Mitra 1994).

Intraspecific variations : Only male specimens from Arunachal Pradesh, Assam, Manipur and West Bengal differ from Fraser's (1936a) description since they possess dark brown labium, labrum, anteclypeus and occiput.

Trithemis pallidinervis (Kirby)
(Figs. 173, 174, 198)

Sympetrum pallidinervis Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 327.

Trithemis pallidinervis Morton, 1907, *Trans. Ent. Soc. Lond.* p. 304. Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 389-391; Lieftinck, 1954, *Treubia* **22** (suppl.) : 156.

Material examined : Assam : Goalpara (235) 1♂, 1♀, 17.vi.1983; Bihar : Hazaribagh (126) 1♀, 18.viii.1973; Palamau (191) 1♂, 16.xi.1974; Nagaland : Zunheboto 1♂, 17.vii.1991 (Deposited in ERS, ZSI & Shillong); Orissa : Bolangir (38b) 1♀, 11.xi.1972; Cuttack (74) 1♂, 2♀, 27.x.1971; Gopalpur (117) 1♂, 22.xi.1973; Sundergarh (275) 2♂, 24.iii.1973; Tripura : Agartala (2) 1♀, 31.x.1974; West Bengal : Birbhum (255) 1♂, 5.x.1974; (260) 9♂, 9.x.1974; Calcutta (52) 1♀, 5.ix.1966; 3♂, 20.x.1966; 11♂, 1♀, 8.x.1966; 1♂, 9.x.1966; 2♂, 1♀, 4.xii.1966; 1♀, 2.iii.1969; 24 Parganas (124) 1♀, 18.viii.1973.

Distribution : *Present records* : Assam, Bihar, Nagaland, Orissa, Tripura, West Bengal. *Past records* : INDIA : *Eastern India* : Dibrugarh, N.E. Assam (Laidlaw 1914); Barkuda Island (Fraser & Dover 1922); Calcutta (Dasgupta 1957), Meghalaya (Lahiri 1987). *Northern India* : Allahabad, Dehra Dun, Lachiwala, Mussorie (Bhasin 1953); Garhwal Hills (Prasad 1974); Kangra (Prasad 1976); Rajasthan (Prasad & Thakur 1981). *Central India* : Bastar (Prasad 1996a). *Southern India* : Khandala, Nilgiris, Palni (Fraser 1924b); Madras (Fraser 1919f);Andhra Pradesh (Joseph & Satyarani 1988). *Western India* : Bombay, Deesa, Poona (Fraser 1919f); Maharashtra (Kalaskar & Kalaskar 1998). Gujarat (Prasad 1984).

Elsewhere : ASIA : Burma, Bhamo, Mandalaya, Palon, Toungoo (Selys 1891); Tennasserim (Lieftinck 1948); Ceylon (Fraser

1919f); China, Formosa (Needham 1930); Nepal (St. Quentin 1970) Taiwan (Lieftinck 1971b); Philippines (Kiauta & Kiauta 1983a, Lieftinck 1971b); Thibet (Fraser 1919f); Indonesia, Malayasia, Singapore, Thailand (Tsuda 1991).

Remark: New record from Tripura and Bihar (Mitra 1994).

Intraspecific variation : The male specimens vary from Fraser's (1936a) description since they have got brownish and ochreous labium, labrum with or without brownish spots, no subdorsal spot on segment 8; females vary from Fraser's (1936a) description since they possess ochreous labium, extensor surface of femora black sporadically marked with yellow.

Genus ***Zygonyx*** Selys-Hagen

Zygonyx Selys-Hagen 1867, *Verh. zool.-bot. Ges. Wien.* **17** : 62; Fraser, 1936, *Fauna Brit. India Odon.* **3** : 391; Lieftinck, 1954, *Treubia* **22** (suppl.) : 158; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 51.

Type-species : *Zygonyx iris* Selys

Distribution : India, China, Burma, Thailand, Vietnam, Malayasia, Indonesia, Philippines, Sri Lanka, Israel, Europe, Africa, Madagascar, Seychelles.

Zygonyx iris iris Selys
(Fig. 176)

Zygonyx iris Selys, 1869, *Ann. Soc. Ent. Belg.* **12** : 97.

Zygonyx iris iris Fraser, 1926, *J. Bombay nat. Hist. Soc.* **31** : 763-764 : 1936, *Fauna Brit. India Odon.* **3** : 394-395.

Material examined : Manipur : Burma border (47) 1♂, 26.ix.1975.

Distribution : *Present record* : Manipur. *Past records* : INDIA : *Eastern India* : Assam, Bengal, Shillong (Fraser 1936a); *Southern India* : Coorg, Malabar, Nilgiris (Fraser 1924b).

Elsewhere : Bangladesh, Nepal (Tsuda 1991).

Remark : An addition to the fauna of Manipur (Mitra 1994).

Intraspecific variation : The specimen varies from Fraser's (1936a) description in having labium bluish yellow, labrum dark brown.

Genus ***Rhyothemis*** Hagen

Rhyothemis Hagen, 1867, *Stett. Ent. Zeit.* **28** : 232; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 419; Lieftinck, 1954, *Treubia* **22** (suppl.) : 166; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 50.

Type-species : *Libellula phyllis* Sulzer

Distribution : India, Nepal, China, Tibet, Sri Lanka, Burma, Thailand, Vietnam, Malayasia, Indonesia, New Guinea, Japan, Taiwan, Phillippines, Australia, Pacific Islands, Syria, Mauretius, Africa, Madagascar, Seychelles.

Key to species of genus *Rhyothemis* Hagen

Wings marked with black and amber .... *variegata variegata* (Linnaeus)

Wings marked with black only .... *plutonia* Selys

Rhyothemis variegata variegata (Linnaeus)
(Fig. 163)

Libellula variegata Linnaeus 1763, *Amoenitates Acad.* 6 : 412

Rhyothemis variegata Hagen, 1867, *Stett. Ent. Zeit.* 28 : 232

Rhyothemis variegata Ris, 1913, *Cat. Coll. Selys Lib.* fasc. **15** : 931; Fraser 1936, *Fauna Brit. India. Odon.* **3** : 423-424.

Material examined : Arunachal Pradesh : Subansiri (85) 1♂, 10.v.1966; Manipur : Ithai Village (130a) 1♀, 29.v.1974; Orissa : Anugul (7) 1♀, 1.x.1972; Chilka (67) 1♂, 19.vi.1986; Cuttack (74) 1♂, 1♀, 22-23.iii.1974; West Bengal : Bankura (38a) 1♂, 4.viii.1974; Birbhum (260) 4♀, 9.x.1974; Calcutta (52) 1♂, 7.ix.1966; Darjeeling (34) 1♀, 19.ix.1972; Howrah (120a) 1♂, 1♀, 16.ix.1974; 24 Parganas (293a) 1♀, 16.ix.1983.

Distribution : *Present records* : Arunachal Pradesh, Manipur, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Sibsagar (Bhasin 1953); Barkuda Island (Fraser &

Dover 1922); Meghalaya (Lahiri 1987); Calcutta (Fraser 1919f); *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Kangra (Prasad 1976); *Central India* : Saugor (Baijal & Agarwal 1955); Bastar (Prasad 1996a). *Southern India* : Cochin, Coorg, Deccan, Malabar, Nilgiris, (Fraser 1931a); Bangalore, Madras (Fraser 1919f); Andhra Pradesh (Joseph & Satyarani 1988). Little Andaman (Lahiri 1998). *Western India* : Bombay (Fraser 1919f).

Elsewhere : ASIA : Bangladesh, Sylhet, Dacca (Bhasin 1953); Chittagonj (Chowdhury & Akhteruzzaman 1981); Annam; Burma, Bhamo, Mandalaya (Fraser 1919f); Teinzo (Selys 1891); Borneo (Lieftinck 1948); Ceylon, Malayasia (Fraser 1936a); China (Klots 1947) Nepal (Kiauta 1975, St. Quentin 1970); Yunnan (Moore 1878). Vietnam (Tsuda 1991).

Remark : An addition to the fauna of Arunachal Pradesh and Manipur (Mitra 1994).

Intraspecific variation : Campion (1917) opined that Fabricius's type of *libellula indica* resembles smaller Indian forms of *Rhyothemis variegata* Linn.

The male examples vary from Fraser's (1936a) description in having brown labrum, a spot in the hypertriangular space; the females are not consistent with Fraser's (1936a) description since they possess brown spots on postclypeus and reddish-yellow colour of the lateral lobes of labium.

Rhyothemis plutonia Selys
(Fig. 165)

Rhyothemis plutonia Selys, 1883, *Ann. Soc. Ent. Belg.* **27** : 89; Fraser, 1936, *Fauna Brit. India. Odon.* 3 : 426-427; Lieftinck, 1954, Treubia **22** (suppl.); 167.

Material examined : Assam : Goalpara (235) 1♂, 12.vi.1973; 3♂, 14.vi.1973.

Distribution : *Present record* : Assam. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur, Upper Assam (Laidlaw 1914); Bengal (Fraser 1920a, Selys 1891); Upper Dihing (Bhasin 1953).

Elsewhere : ASIA : Burma, Teinzo (Selys 1891); Thailand (Titayavan 1979); Bangladesh, Indonesia, Malayasia, Nepal, Thailand, Vietnam (Tsuda 1991).

Intraspecific variation : The examples are not consistent with the description cited in the Fauna of British India (Vol. 3) since they possess brownish black labium, labrum, face; dark brown occiput; blackish brown prothorax, legs and abdomen.

Genus ***Zyxomma*** Rambur

Zyxoma Rambur, 1842, *Ins. Nevrop.* p. 26, 30; Hagen 1849, *Stett. Ent. Zeit.* 10 : 171; Fraser, 1936, *Fauna Brit. India Odon.* 3 : 407-408; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 50.

Type-species : *Zyxomma petiolatum* Rambur

Distribution : India, Burma, Sri Lanka, Africa, Seychelles, Sundaic Archipellago, Philippines, New Guinea, Australia.

Zyxomma petiolatum Rambur
(Fig. 178)

Zyxomma petiolatum Rambur, 1842, *Ins. Nevrop.* p. 30; Hagen, 1858, *Verh. zool.-bot. Ges. Wien.* **8** : 479; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 409-410.

Material examined : West Bengal : Dum Dum (96) 1♀, 15.iii.1988; 1♀, 24.iii.1989.

Distribution : *Present record* : West Bengal. *Past records* : INDIA : *Eastern India* : Calcutta (Ram *et. al.* 1982) Barkuda Island (Fraser & Dover 1922); *Northern India* : Doon Valley (Singh & Prasad 1976b); Kangra (Prasad 1976); *Southern India* : Coorg, Deccan (Fraser 1931a); Madras (Fraser 1920c); *Western India* : Bombay, Laccadives Island (Fraser 1924b); Poona (Fraser 1920c); Andamans (Middle & South) (Hämäläinen *et. al* 1999).

Elsewhere : ASIA : Bangladesh, Chittagong (Chowdhury & Akhteruzzaman 1981); Burma (Fraser 1936a), China (Needham 1930); Hong Kong, Indonesia, Japan, Malayasia, Philippines, Singapore, Sri Lanka, Thailand, Vietnam (Tsuda 1991), Micronesia (Lieftinck 1962); Taiwan (Lieftinck *et. al.* 1984) Seychelles (Blackman & Pinhey 1966).

Remark : A new record from West Bengal (Mitra 1994).

Intraspecific variations : The specimen agrees with the description provided by Fraser (1936a) in the Fauna of British India, Vol. 3, but the colour of the thorax is dull brown instead of chocolate brown; the legs are yellow.

Genus ***Tholymis*** Hagen

Tholymis Hagen, 1867, *Stett. Ent. Zeit.* **28** : 221; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 410; Lieftinck, 1954, *Treubia* **22** (suppl.) 161; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 50.

Type-species : *Libellula tillarga* Fabricius

Distribution : India, Tibet, Sri Lanka, Burma, Thailand, Malayasia, Indonesia, Taiwan, Philippines, Australia, Pacific Islands; Mauretius, Africa, Madagascar, North America, South America.

Tholymis tillarga (Fabricius) (Fig. 177)

Libellula tillarga Fabricius, 1798, *Ent. Syst.* Suppl. p. 285

Tholymis tillarga, Hagen, 1867, *Stett. Ent. Zeit.* **28** : 220; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 411-413; Lieftinck, 1954; *Treubia* **22** (suppl.) : 161.

Material examined : Assam : Barpeta (3) 2♂, 6.iv.1986; (92) 1♀, 10.iv.1986; Goalpara (232) 1♂, 3.vi.1973; 1♂, 14.vi.1973; (132) 1♀, 16.xii.1973; (235) 1♂, 21.xii.1973 : Bihar : Hazaribagh (126) 1♂, 30.vi.1975; Manipur : Ithai Village (130a) 1♂, 29.v.1975; Mizoram : Bluemountain (38c) 1♀, 8.i.1987; Nagaland : Dimapur 1♀, 10.ix.1994; Orissa : Bolangir (38b) 1♂, 29.x.1972; Cuttack (74) 1♀, 28.x.1971; Keonjhar (159) 1♀, 19.x.1972; Tripura : Agartalla (232) 1♂, 29.x.1974; Ambassa (4) 1♂, 28.x.1972; (193) 1♂, 18.xi.1974; Manu (184) 1♂, 23.xi.1974; Teliamura (101) 1♀, 12.xi.1974; West Bengal : Bankura (65) 2♀, 3.vii.1974; Birbhum (255) 1♀, 14.ix.1974; Calcutta (52) 1♂, 10.x.1966; 4♂, 3♀, 7.vii.1967; 1♂, 8.ix.1967; Howrah (120a) 1♂, 6.viii.1974; 1♂, 6.x.1974; Jalpaiguri (251) 1♂, 29.viii.1975. 24 Parganas (124) 1♂, 22.viii.1973; (209) 1♂, 12.x.1974.

Distribution : *Present records* : Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, West Bengal. *Past records* : INDIA : *Eastern India* : Dejoo, North Lakhimpur, Upper Assam (Laidlaw 1914); Barkuda Island (Fraser & Dover • 1922); Arunachal Pradesh (Lahiri 1977a); Meghalaya (Lahiri 1987); *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Kangra (Prasad 1976); *Central India* : Trichur (Baijal & Agarwal 1955); Bastar (Prasad 1996a); *Western India* : Goa (Prasad 1995). *Southern India* : Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); *Western India* : Poona, (Fraser 1919b); Laccadives (Fraser 1924b).

Elsewhere : ASIA : Bangladesh, Chittagonj (Chowdhury & Akhteruzzaman 1981); Burma, Bhamo (Selys 1891); China (Klots 1947); Ceylon, Indo-China, Indo-Malayasia (Fraser 1920c); Nepal (Kiauta & Kiauta 1982a); Thibet (Fraser 1920c); Micronesia (Lieftinck 1962); Japan, Kampuchea, Laos, Vietnam (Tsuda 1991). AFRICA : Garamba National Park (Pinhey 1966b); Mocambique (Pinhey 1981b); Malawi (Pinhey 1966a, 1979b); Ethiopea (Pinhey 1981a); Tanzania (Pinhey & Pinhey 1984); Cameroon (Pinhey 1974a); Somali (Carfi 1974); Madagascar (Fraser 1956); AMERICA (Borror 1945). AUSTRALIA (Tsuda 1991).

Remark : New record from Mizoram (Mitra 1994).

Genus ***Pantala*** Hagen

Pantala Hagen, 1861, *Syn. Neur. Amer.* p. 141; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 413; Lieftinck, 1954, *Treubia* **22** (suppl.) 162; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 50.

Type-species : *Libellula flavescens* Fabricius

Distribution : Cosmopolitan; through out the tropical and sub-tropical belts of the world.

Pantala flavescens (Fabricius) (Fig. 201)

Libellula flavescens Fabricius, 1798, *Ent. syst.* suppl. p. 285.

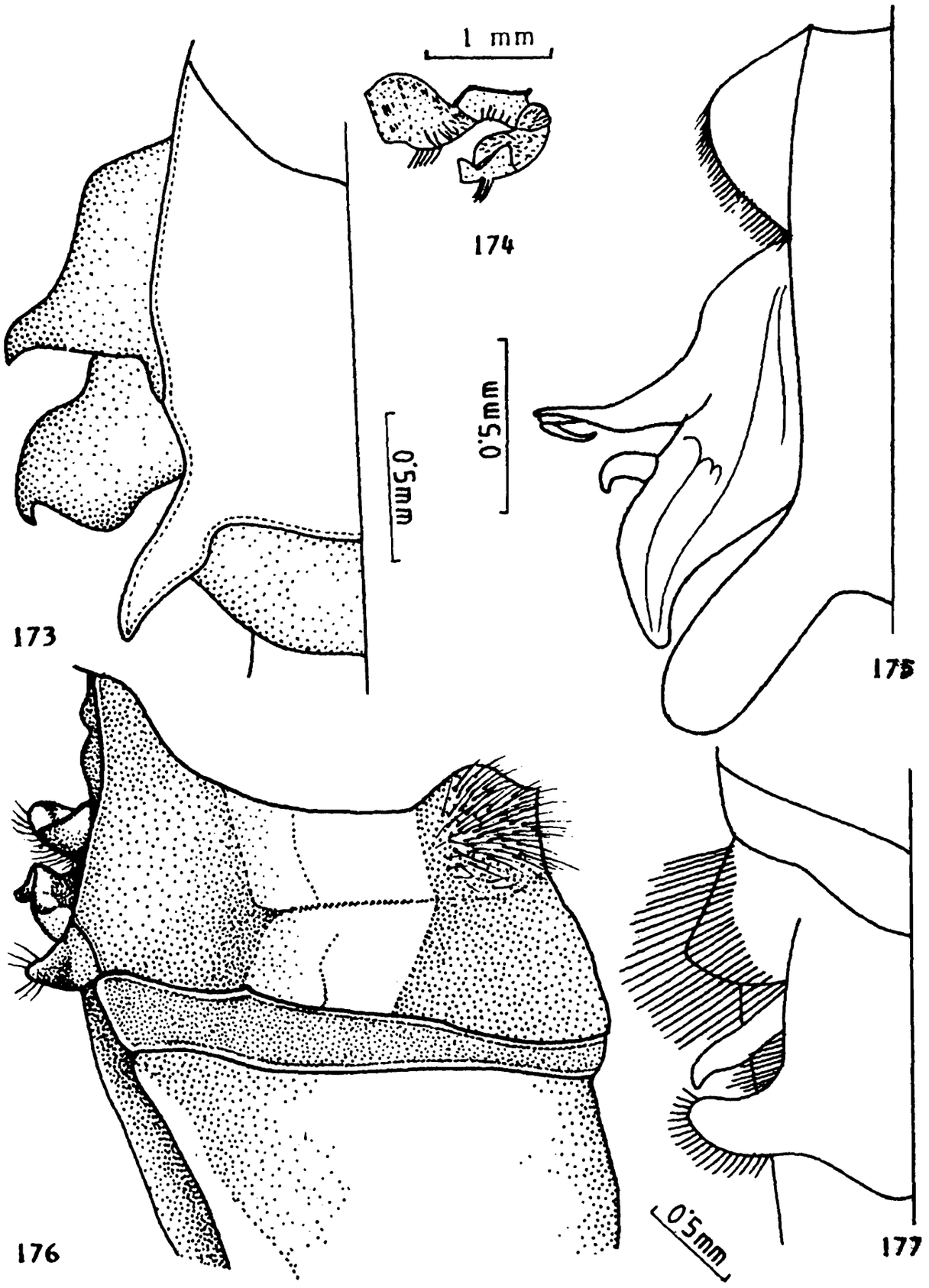


Fig. 173-177. 173. Genitalia of male *Trithemis pallidinergis* (Kirby); 174. Penis of the same; 175. Genitalia of male *Sympetrum hypomelas* (Selys); 176. Genitalia of male *Zygonyx i. iris* Selys; 177. Genitalia of *Tholymis tillarga* (Fabr.)

Pantala flavescens Hagen, 1861, *Syn. Neur. N. Amer.* p. 142; Fraser, 1936, *Fauna Brit. India Odon* 3 : 414-416; Lieftinck *Treubia* 22 (suppl.); 162.

Material examined : Assam : Barpeta (3) 1♀, 6.iv.1986; 5♂, 8♀, 7.iv.1986; (92) 3♂, 10.iv.1986; Goalpara (235) 8♀, 12.vi.1973; 1♂, 1♀, 14.vi.1973; 2♂, 3♀, 17.vi.1973; (217) 1♂, 12.v.1979; Bihar : Hazaribagh (126) 1♂, 2.xi.1974; Palamau (222) 1♂, 7.xi.1974; 1♂, 3.vii.1975; Singhbhum (24) 1♀, 4.xii.1974; 1♂, 8.xii.1974; Manipur : Mao (196) 1♂, 16.ix.1975; 1♂, 19.ix.1975; New Churachandpur (46) 1♂, 19.ix.1975; Mizoram : Aibawk (2a) 1♂, 19.x.1991; Nagaland : Mon district 1♀, 8.vi.1990 (Deposited in ERS, ZSI, Shillong); Orissa : Anugul (7) 1♀, 30.ix.1972; Bolangir (38b) 5♀, 2.xi.1972; 1♀, 10.xi.1972; 1♂, 3.xi.1973; 1♂, 4.xi.1973; Jharansai (138) 1♂, 17.ix.1972; Keonjhargarh (159a) 1♂, 19.ix.1972; 2♂, 7♀, 23.xi.1972; 1♂, 24.ix.1972; 2♂, 1♀, 25.ix.1972; 2♂, 2♀, 26.ix.1972; 1♀, 27.ix.1972; 1♀, 4.vi.1973; Mayurbhanj (194) 1♂, 19.iii.1973; (263a) 1♂, 28.i.1986; Sundergarh (275) 1♂, 1♀, 14.ix.1972; 1♀, 21.ix.1972; 1♂, 1♀, 23.ix.1972; 1♀, 27.x.1972; Sikkim : Tumin (287a); 1♂, 30.ix.1988; 2♂, i.x.1988; Tripura : Agartala (2) 1♀, 4.xi.1970; (232) 2♂, 29.x.1971; (236) 1♂, 30.x.1971; Ambassa (152) 1♂, 20.xi.1974; Belonia (28a) 1♀, 2.x.1977; Manu (83) 1♀, 24.xi.1974; (133) 1♀, 25.xi.1974; Teliamura (281a) 1♂, 23.x.1977; West Bengal : Bankura (38a) 1♂, 1♀, 4.viii.1974; Birbhum (260) 2♂, 9.x.1974; Calcutta (52) 1♀, 11.ix.1966; 4♂, 2♀, 3.vi.1967; 1♂, 20.vii.1967; Darjeeling (71) 1♂, 20.viii.1978; Jalpaiguri (131a) 2♂, 25.viii.1983; 24 Parganas 1♂, 26.viii.1973; (250a) 2♂, 10.ix.1983; (179a) 1♂, 11.ix.1983; (10a) 1♀, 15.ix.1983; (293a) 1♀, 16.ix.1983; (10a) 1♀, 17.ix.1983 (32a) 1♂, 18.ix.1983; 1♀, 24.ix.1983.

Distribution : A migratory species of India. *Present records* : Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura, West Bengal. *Past records* : INDIA : *Eastern India* : Arunachal Pradesh; Assam (Lahiri 1979); Lakhimpur, U. Dihing; Sibsagar (Bhasin 1953); Chilka Lake, Midnapore (Dasgupta 1957); Barkuda Island (Fraser & Dover 1922); Calcutta (Mitra 1983) Meghalaya (Lahiri 1987). *Northern India* : Uttar Pradesh (Kumar 1982); Western Himalaya (Singh 1955 Kumar & Prasad 1981, Singh 1955); Dehra Dun (Bhasin 1953); Garhwal Hills (Prasad 1974) Kashmir (Calvert 1898); Rajasthan (Prasad & Thakur 1981) *Southern India* : Bolovumpattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palni Hills (Fraser 1931a); Andhra Pradesh (Joseph & Satyarani 1988). *Western India* : Mahabaleswar (Fraser 1921d); Goa (Prasad 1995). Andaman Island (Fraser 1924a); Nicobar Island (Brauer 1864). *Central India* : Bastar (Prasad 1996a).

Elsewhere : ASIA : Burma, Bhamo, Puepoli, Toungoo, (Selys 1891); Bangladesh, Chittagong (Chowdhury & Akhteruzzaman 1981); China, Peking (Rowe 1981); Malayasia (Brooks 1981; Lieftinck 1954); Nepal (Asahina 1955; Kiauta 1975; St. Quentin 1970); Yunnan (Moore 1878); Pamir (Wojtusiak 1974); Singapore (Kiauta & Kiauta 1982b); Ceylon (Lieftinck 1971b) AFRICA : Somaliland (Carfi 1974); Mauretiana (Dumont 1976); Mocambique (Pinhey 1981b); Garamba National Park (Pinhey 1966b, 1979b); Zambezi River (Pinhey 1979a); Malawi (Pinhey 1966a); Angola (Pinhey 1961); Ethiopea (Pinhey 1981a); Mt. Mlanje, Karonga, Salima Bay (Pinhey 1979c); Principe, Sao, Tome, Fernando, Po, (Pinhey 1974a); Ngamiland (Pinhey 1967); Seychelles (Blackman & Pinhey 1967); Madagascar (Fraser 1956); AMERICA : Argentina (Jurizitza 1981); Florida (Beller 1978); Texas (Donnelly 1978); Uruguay (De Abenante & Philippi 1982); Venezuela (Garrison 1983); Cuba, Cayo Avalos (Carfi 1975).

Remark : New record from Manipur, Mizoram, Sikkim, Tripura (Mitra 1994).

Genus ***Tramera*** Hagen

Tramea Hagen, 1861, *Syn. Neur. Amer.* p. 114; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 431; Lieftinck, 1954, *Treubia* **22** (suppl.) : 162; Davies, 1981, *Synop. Ext. Gen. Odon.* p. 50.

Trapezostigma Hagen, 1849, *Stett. Ent. Ztg.* 10 : 174.

Type-species : *Libellula carolina* Linne-Johansen

N.B. Gloyd (1972) appealed to preserve the name *Tramea* for honoring the work of the first reviser.

Distribution : Cosmopolitan

Key to Species of Genus *Tramea* Hagen

1. Bright yellow nervures in the dark reddish-brown marking area of the base of the hind-wing ..... *basilaris burmeisteri* Kirby

– Red nervures in the dark brown marking area at the base of the hindwing 2

2. Black spot in the hind wing, which does not extend upto the base of the anal loop ..... *limbata similata* Rambur

– Reddish-brown spot in the hind wing, which extends distally to invade the anal loop ..... *virginia* (Rambur)

Tramea basilaris burmeisteri Kirby

Libellula chinensis Burmeisteri, 1839, *Handb. Ent.* **2** : 852

Tramea burmeisteri Kirby, 1889, *Trans, zool. Soc. Lond.* **12** : 316.

Tramea basilaria bumeisteri Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 432-434.

Material examined : Bihar : Palamau (191) 1 ♀, 7.xi.1974; Orissa : Anugul (7) 1 ♂, 1.x.1972; Bolangir (38b) 1 ♀, 10.xi.1972; Gopalpur (117) 2 ♂, 22.xi.1973; Keonjhargarh (159a) 1 ♂, 20.ix.1972; Sambalpur (252) 1 ♂, 7.xi.1972; Sundergarh (275) 2 ♂, 26.x.1972; West Bengal : Birbhum (271) 1 ♂, 1 ♀, 14.ix.1974; Calcutta (52) 1 ♀, 8.ix.1966.

Distribution : *Present records* : Bihar, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Barkuda Island (Fraser & Dover 1922); Calcutta (Mitra 1983); Chilka Lake (Dasgupta 1957); *Northern India* : Uttar Pradesh (Ram *et. al.* 1983); Rajasthan (Bose & Mitra 1976); Western Himalaya (Kumar & Prasad 1981); *Central India* : Saugor, (Baijal & Agarwal 1955) Bhandara (Mitra 1988); Bastar (Prasad 1996a). *Southern India* : Bolovumpattis, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); *Western India* : Bombay, Kathiwar (Fraser 1920a); Mahabaleswar (Fraser 1921d); North-Western India (Kimmins 1968).

Elsewhere : ASIA : Burma, Ceylon, Indo-Malaya (Fraser 1920a) Nepal (Kiauta & Kiauta 1982a, St. Quentin 1970); Thibet (Fraser 1920a); Japan, Thailand, Vietnam (Tsuda 1991).

Remark : New record from Bihar and West Bengal (Mitra 1994).

Intraspecific variations : One male (1 ♂) from Rajasthan varies from the specimens under study in having reddish-yellow venation in the dark basal area at the base of the hindwing. Only the male examples vary from Fraser's (1936a) description since they possess bluish yellow labium, prothorax; olivaceous yellow, anteclypeus and sides of the postclypèus.

Tramea virginia (Rambur)
(Figs. 179, 180)

Libellula chinensis De Geer, 1773, *Mem. Ins.* **3** : 556.

Libellula virginia Rambur, 1842, *Ins. Nevrop.* p. 33.

Tramea virginia Kirby, 1890, *Syn. Cat. Neur. N. Amer.* p. 3 : Fraser, 1936, *Fauna Brit. India Odon.* **3** : 435-436, Lieftinck, 1954, *Treubia* **22** (suppl.) : 164.

Material examined : Mizoram : Bung (45a) 1 ♂, 26.x.1991 Orissa : Joshipur (143) 1 ♂, 6.vii.1973; West Bengal : 24 Parganas (119a) 1 ♂, 16.ix.1983.

Distribution : *Present records* : Mizoram, Orissa and West Bengal. *Past records* : INDIA : *Eastern India* : Bhubaneswar (Dasgupta 1957); *Northern India* : Western Himalaya (Kumar & Prasad 1981). *Southern India* : Tamil Nadu (Kumar & Khatri 1985; Kumar 1990). *Central India* : Bastar (Prasad 1996a). Great Nicobar Island (Mitra 1995a). Andaman Islands (Lahiri & Mitra 1993).

Elsewhere : ASIA : Burma, Billiton, Borneo (Lieftinck 1962); China, Indo-China (Fraser 1924e; 1936a); Japan, Micronesia, Siam (Lieftinck 1962). China (Needham 1930).

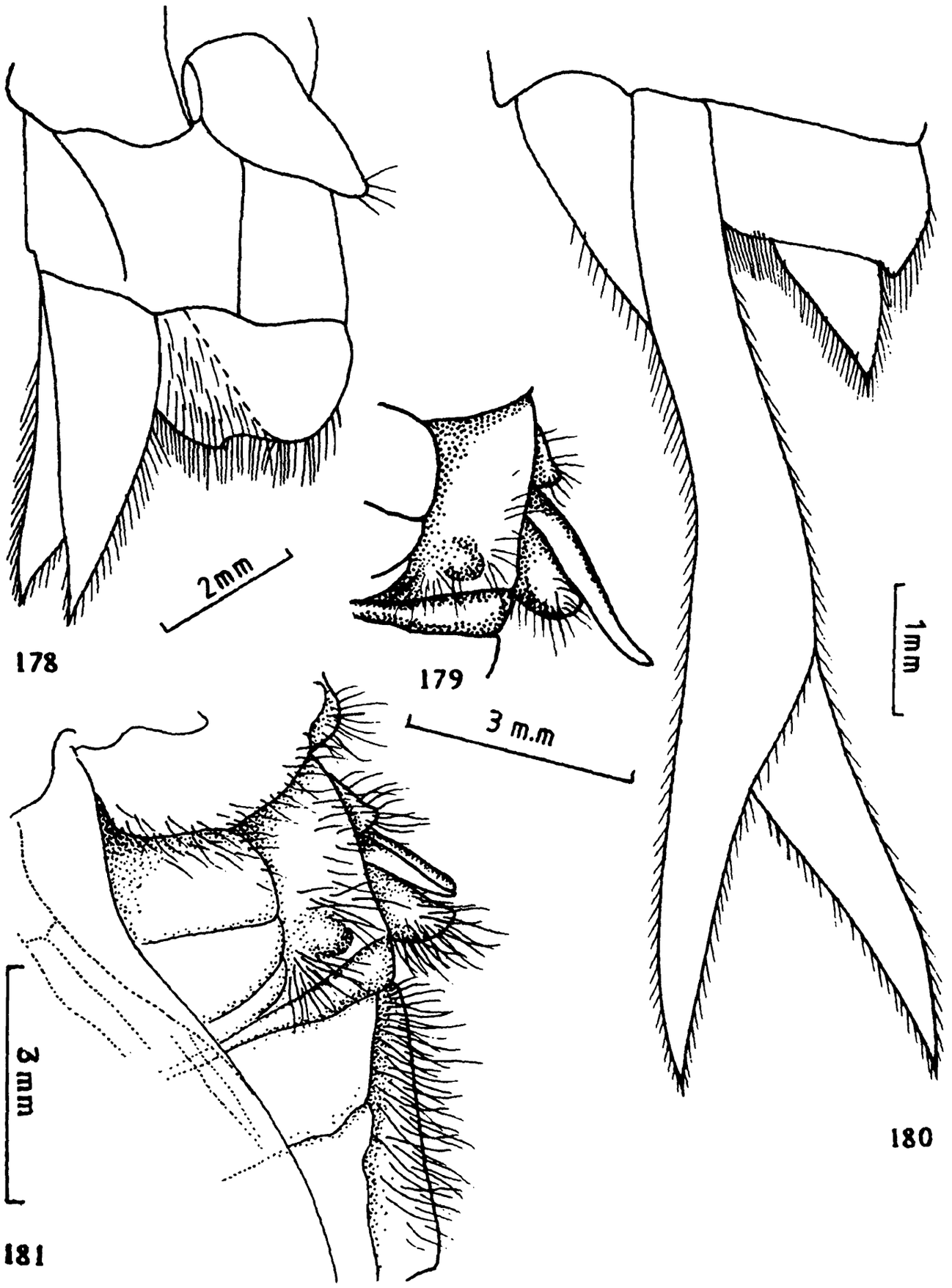


Fig. 178-181. 178. Anal appendages and genitalia of female *Zyxomma petiolatum* Rambur; 179. Genitalia of male *Tramea virginia* (Rambur); 180. Genitalia of female of the same; 181. Genitalia of male *Tramea limbata similata* (Rambur)

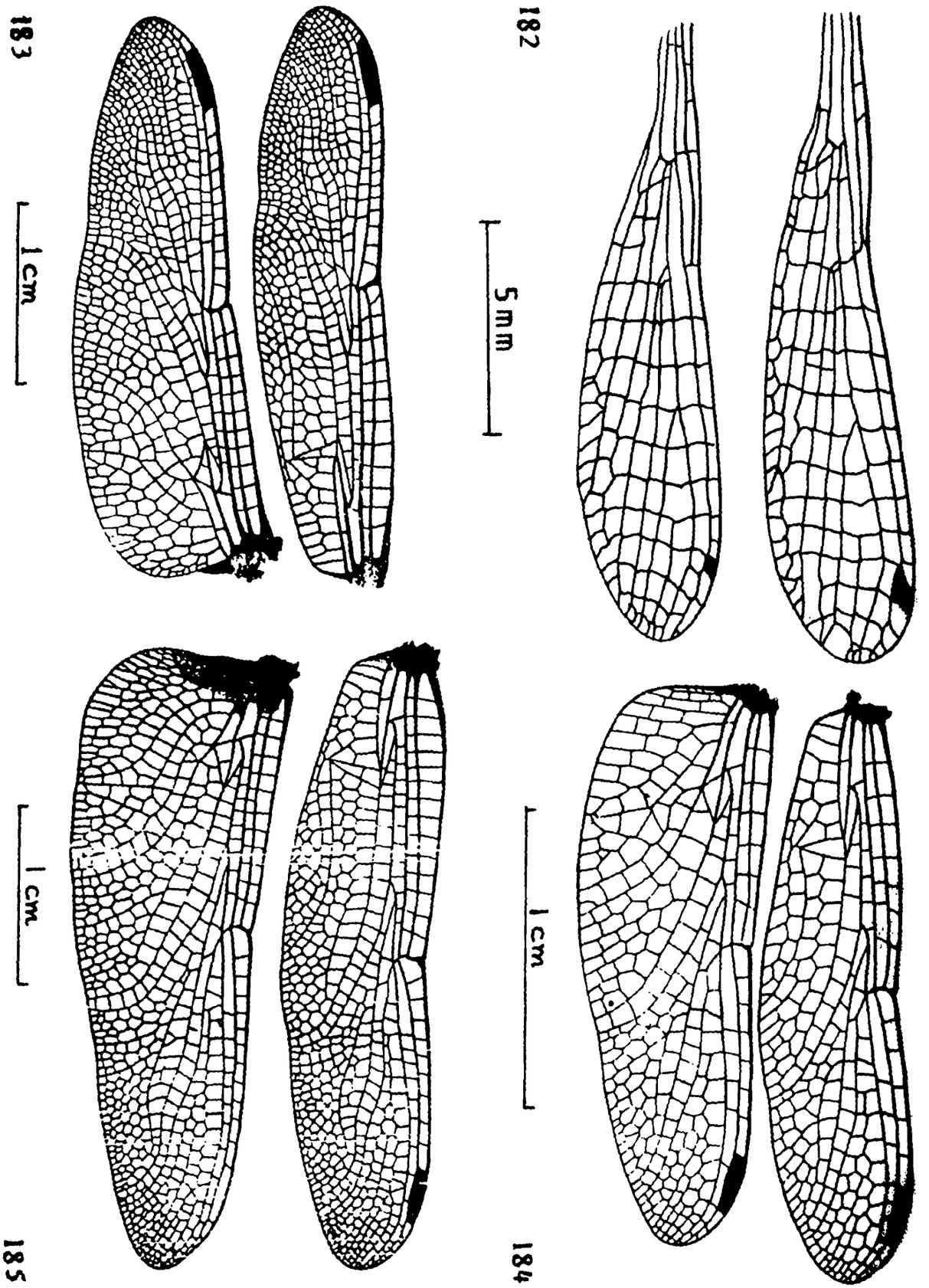
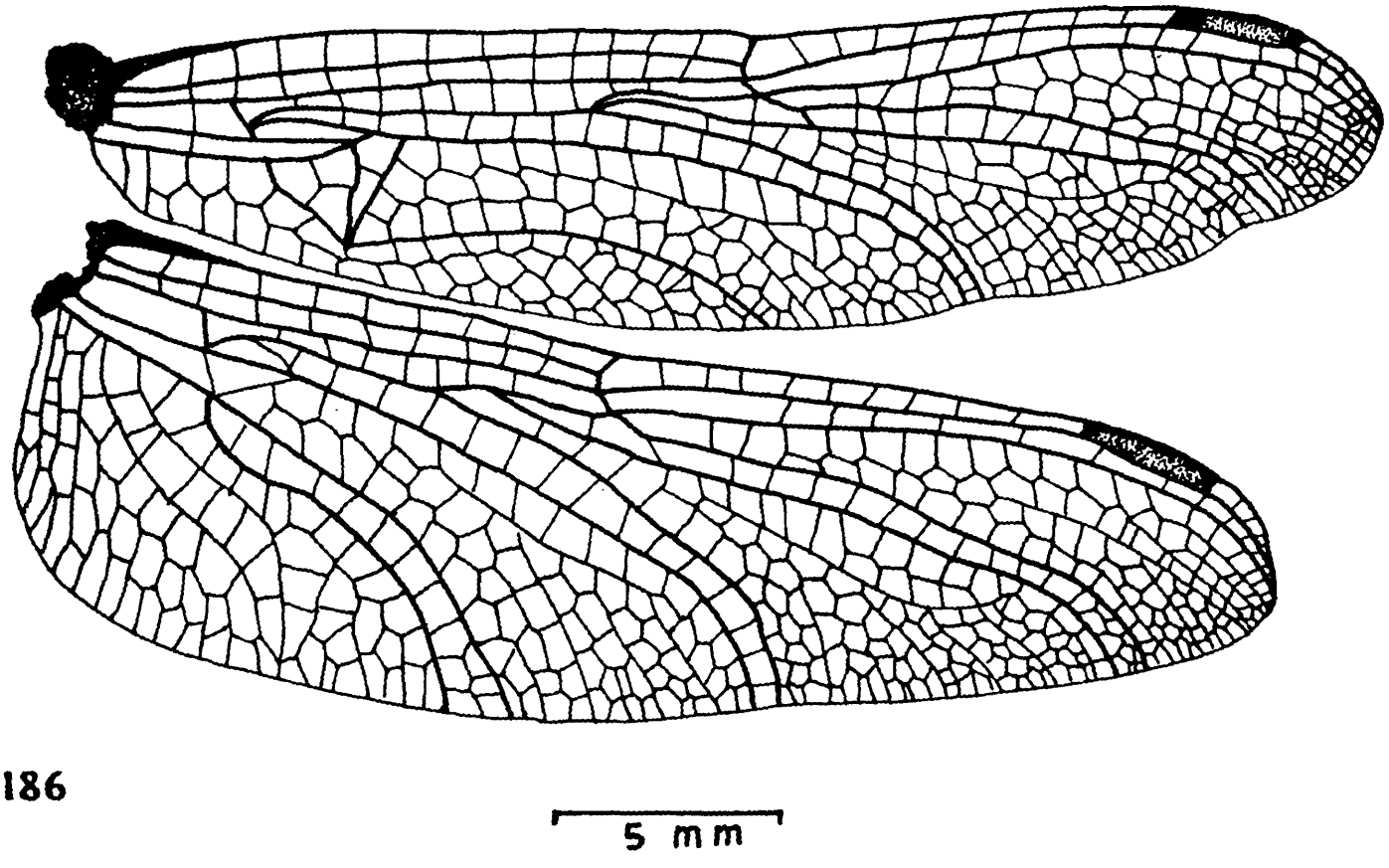


Fig. 182-185. 182. Fore-and hind wings of *Ischnura forcipata;* 183. Fore-and hind wings of *Diplacodes nebulosa* (Fabr.); 184. Fore-and hind wings of *Potamarcha congener* (Rambur); 185.Fore-and hind wings of *Orthetrum pruinosum neglectum* (Rambur)



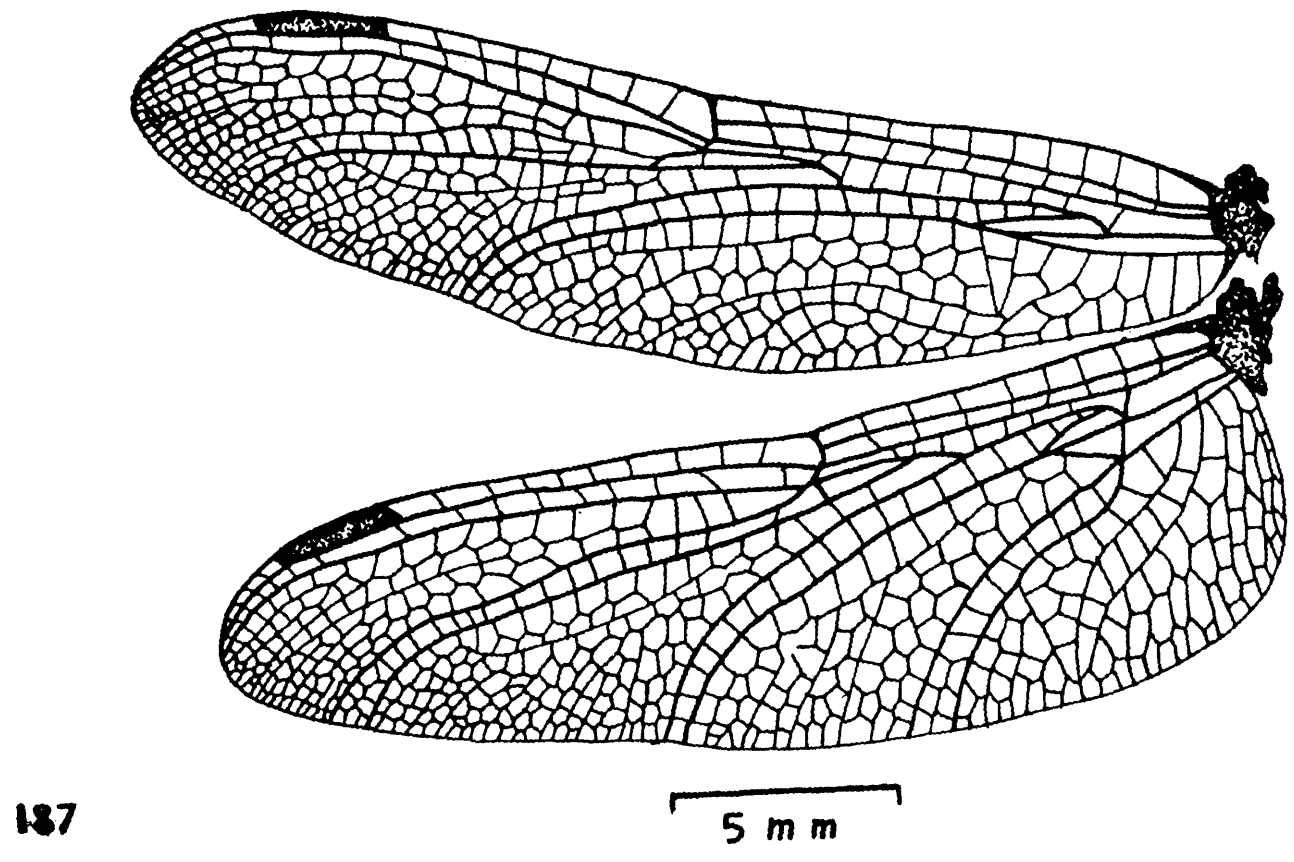


Fig. 186-187. 186. Fore-and hind wings of *Orthetrum anceps* (Schneider); 187. Fore-and hind wings of *Orthetrum* sp.

Bangladesh, Hongkong, Indonesia, Kampuchea, Malayasia, Thailand, Taiwan, Vietnam (Tsuda 1991).

Remark : New record from Mizoram and West Bengal (Mitra 1994).

Intraspecific variations : The present examples vary from the description provided by Fraser (1936a) due to the possession of chrome-yellow labium with brown middle and lateral lobes; pale blue face and frons; dark brown marking at the base of the wings extends beyond the discoidal cell.

Tramea limbata similata (Rambur)
(Fig. 181)

Libellula similata Rambur, 1842, *Ins. Nevrop.* p. 36

Libellua limbata Desjardins, 1832, *Rapport Soc. Maurice* p. 1.

Tramea limbata, Kirby, 1889, *Trans. Zool. Soc. Lond.* 12 : 318. Fraser, 1936, *Fauna Brit. India Odon.* 3 : 436-438.

Tramea limbata similata, Tsuda, 1991, *A distributional list of world Odonata 1991*, p. 184.

Material examined : Assam : barpeta (3) 1♂, 1♀, 6.iv.1986; 1♂, 8.iv.1986.

Distribution : *Present records* : Assam. *Past records* : INDIA : *Southern India* : Mercara, Coorg, (Fraser 1924b); Bolovumpattis, Cochin, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931a); *Western India* : Laccadives (Fraser 1924b).

Elsewhere : ASIA : Ceylon (Fraser 1936a); Nepal (Tsuda 1991).

Remark : New record from eastern India. (Mitra 1994).

RECORDED FROM LITERATURES

Taxa reported in earlier literature but could not be examined due to lack of specimens are cited here. *Rhinocypha biforata beatifica* Fraser, *Calicnemia pulverulans* Selys, *Coeliccia vacca* Laidlaw, *Copera superplatypes* (Fraser), *Gynacantha bainbriggei* Fraser *Camacinia gigantea* (Brauer) *Hydrobasileus croceus* (Brauer) specimens could be obtained after the finalisation of the manuscript. The data for them have been cited here.

Suborder ZYGOPTERA

Superfamily CALOPTERYGOIDEA

Family CALOPTERYGIDAE

Genus ***Caliphaea*** Selys

Caliphaea Selys, 1859, *Bull. Acad. Belg.* (2) **7** : 439.

Distribution : India, Burma, Bhutan, China, Nepal, Laos, Thailand.

Caliphaea confusa Hagen (in Selys 1859)

Caliphaea confusa Hagen, in Selys, 1859, *Bull. Acad. Belg.* (2) 7 : 440.

Distribution : INDIA : *Eastern India* : Assam, Bengal (Fraser 1929b); Meghalaya (Lahiri, 1987); Mizoram (Prasad 1997c).

Elsewhere : ASIA : China (Klots 1947; Needham 1931-1932) Tibet (Fraser 1929b); Nepal (Fraser 1929b; Kimmins 1969); Bhutan, Burma, Laos, Thailand (Tsuda 1991).

Family EUPHAEIDAE

Genus ***Bayadera*** Selys

Bayadera Selys, 1854, *Mon. Calop.* p. 162.

Distribution : India, Bangladesh, Malayasia, Philippines, Thailand, Laos, Indonesia.

Bayadera longicauda Fraser

Bayadera longicauda Fraser, 1928, *J. Bombay nat. Hist. Soc.* **33** : 353.

Distribution : INDIA : *Eastern India* : Sikkim (Fraser 1928c, 1934b).

Elsewhere : ASIA : Nepal, Thailand (Tsuda 1991).

Genus ***Anisopleura*** Selys

Anisopleura Selys, 1853, *Syn. Calop.* p. 48.

Distribution : East Palaearctic and Oriental region.

Anisopleura lestoides Selys

Anisopleura lestoides Selys, 1853, *Syn. Calop.* p. 48.

Distribution : INDIA : *Eastern India* : Darjeeling, Gopaldhara (Laidlaw 1917a); Assam, Bengal, Sikkim (Fraser 1928c); Arunachal Pradesh (Prasad 1997b). *Northern India* : Dehra Dun (Kumar & Prasad 1977); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Bangladesh, Nepal, Vietnam (Tsuda 1991).

Genus ***Schmidtiphaea*** Asahina

Schmidtiphaea, Asahina, 1978, *Proc. Jap. Soc. Syst. Zool.* (1978) p. 44.

Distribution : India, Thailand.

Schmidtiphaea schmidi Asahina

Schmidtiphaea schmidi Asahina, 1978 *Proc. Jap. Soc. Syst. Zool.* (1978) (14) : 44.

Distribution : INDIA : *Eastern India* : Huiaha, Manipur (3800-5000') (Asahina 1978).

Elsewhere : ASIA : Thailand (Tsuda 1991)

Family AMPHIPTERYGIDAE

Genus ***Philoganga*** Kirby

Philoganga Kirby, 1890, *Cat. Odon.* p. 11.

Distribution : India, Burma, Bangladesh, China, Malayasia, Nepal, Thailand.

Philoganga montana (Selys)

Anisopleura montana Selys, 1859, *Bull. Acad. Belg.* (2) 7 : 445.

Distribution : INDIA : *Eastern India* : Darjeeling, Shillong (Fraser 1929a, 1934b).

Elsewhere : ASIA : Bangladesh, Malayasia, Nepal (Tsuda 1991).

Family CHLOROCYPHIDAE

Genus ***Rhinocypha*** Rambur

Rhinocypha Rambur, 1842, Ins. Nevrop. p. 114.

Distribution : Oriental and Australian region.

Rhinocypha trimaculata Selys

Rhinocypha trimaculata Selys, 1853, *Syn. Cal.* p. 62.

Distribution : INDIA : *Eastern India* : Assam, Cachar (Fraser 1927b, 1934b).

Rhinocypha perforata beatifica Fraser

Rhinocypha perforata beatifica Fraser, 1927, *Rec. Indian Mus.* 29 :

Material examined : Nagaland : Mon district. 1♀, 8.vi.1990 (Deposited in ERS, ZSI, Shillong)

Distribution : INDIA : *Eastern India* : Naga Hills (Fraser 1928a, 1934b). Mitra *et. al.* (2002).

Rhinocypha perforata limbata Selys

Rhinocypha perforata var. *limbata* Selys, 1879, *Bull. Acad. Belg.* (2) 47 : 92.

Rhinocypha perforata limbata Fraser, 1928, *J. Bombay nat. Hist. Soc.* 32 : 451-452.

Distribution : INDIA : *Eastern India* : Assam, (Fraser 1934b).

Elsewhere : ASIA : Annam, Burma, (Fraser 1934b) China, Malayasia, Thailand (Tsuda 1991).

Rhinocypha biforata biforata Selys

Rhinocypha biforata Selys, 1859, *Bull. Acad. Belg.* (2) **7** : 446.

Rhinocypha biforata beesoni Fraser, 1933, *Fauna Brit. India, Odon.* **2** : 48.

Distribution : INDIA : *Eastern India* : Sibsagar (Bhasin 1953); *Northern India* : Uttar Pradesh, Dehra Dun Lachiwala (Fraser 1928a).

Elsewhere : ASIA : Burma (Fraser 1928a; 1934b); China, Indonesia, Laos, Malayasia, Nepal, Thailand (Tsuda 1991).

Rhinocypha vitrinella Fraser

Rhinocypha vitrinella Fraser, 1935, *Rec. Indian Mus.* **37** : 332.

Distribution : INDIA : *Eastern India* : Cachar, Assam (Fraser 1935); Meghalaya (Lahiri 1987).

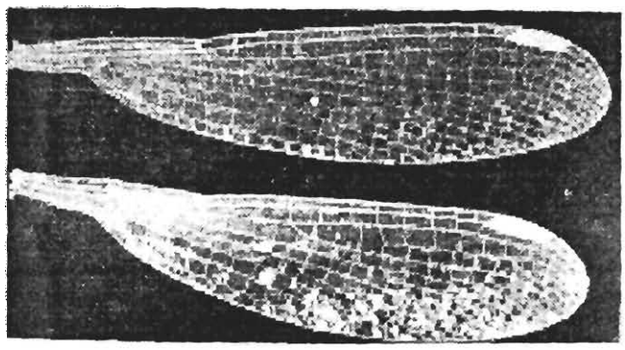
Superfamily LESTOIDEA

Family LESTIDAE

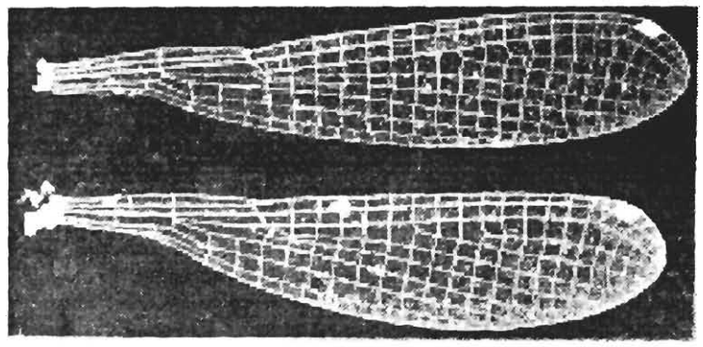
Genus ***Lestes*** Leach

Lestes Leach, 1815, *Edinb. Encycl.* 9 : 137.

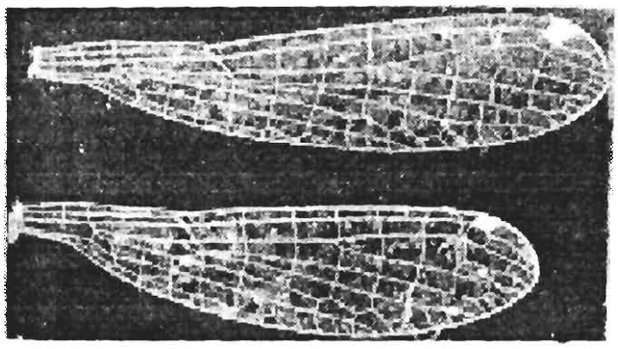
Distribution : Cosmopolitan



188



189



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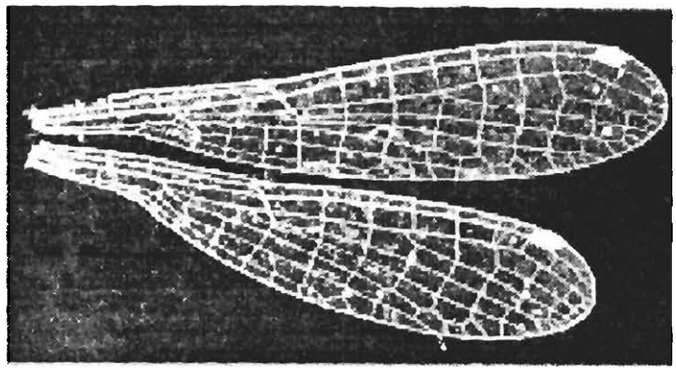
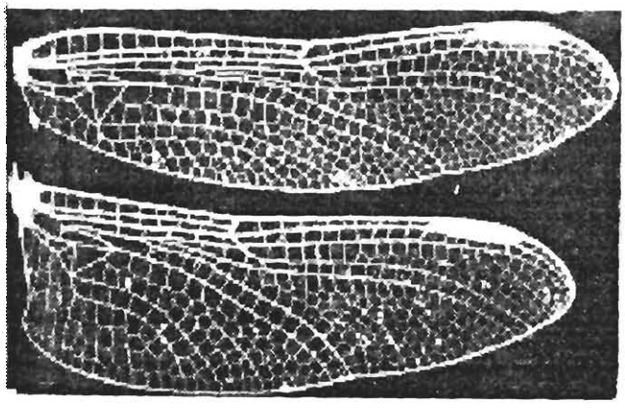


191



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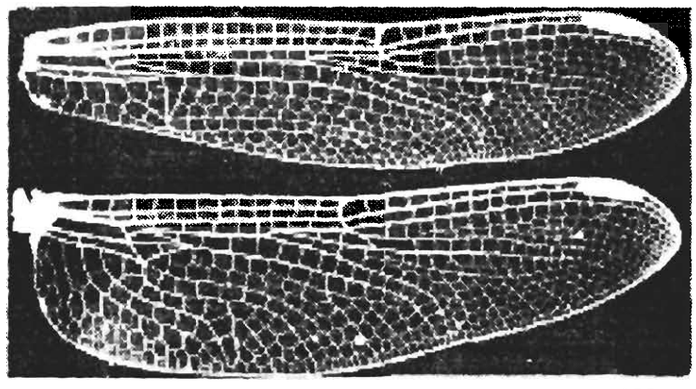
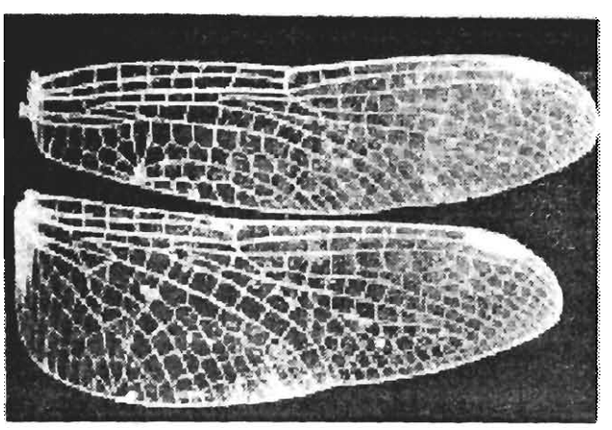
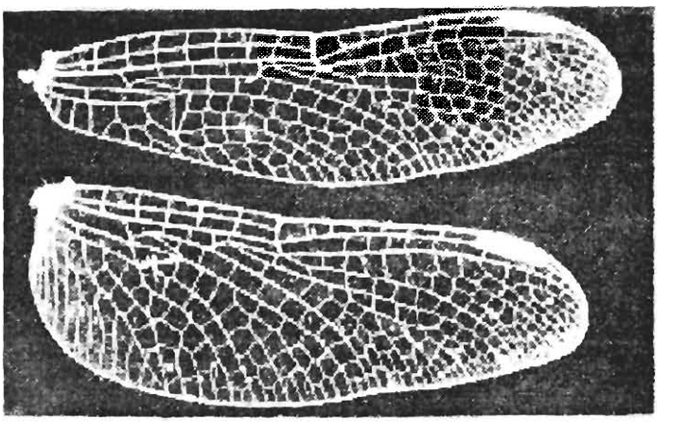


193

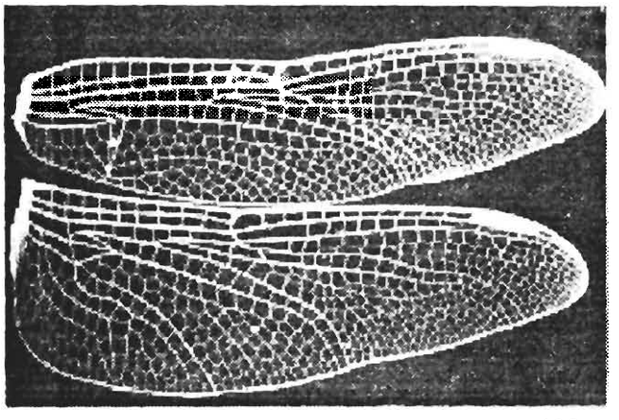
Fig. 188-193. 188. Fore-and hind wings of *Lestes viridulus* Rambur; 189. Same of *Calicnemia miles* (Laidlaw); 190. Same of *Ischnura a. aurora* (Brauer); 191. Same of *Agriocnemis p. pygmaea* (Rambur); 192. Same of *paragomphus lineatus* (Selys); 193. Same of *Cratilla l. lineata* (Brauer)



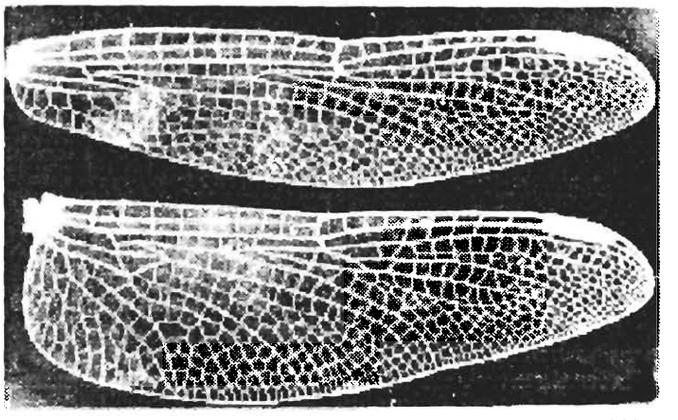
194



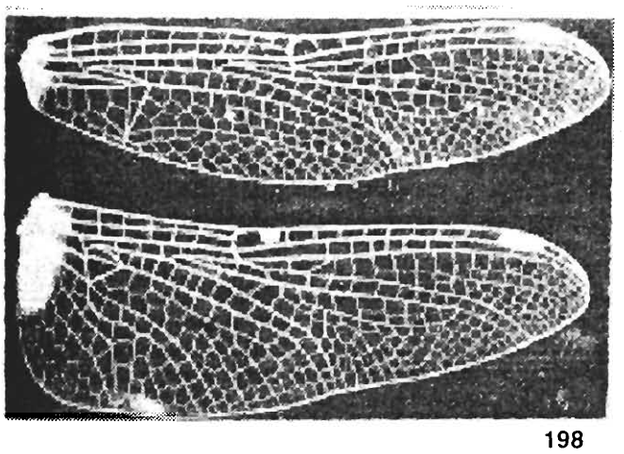
195



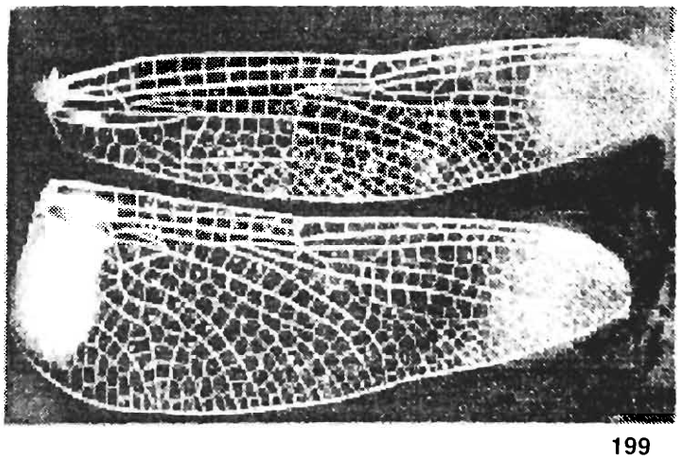
196



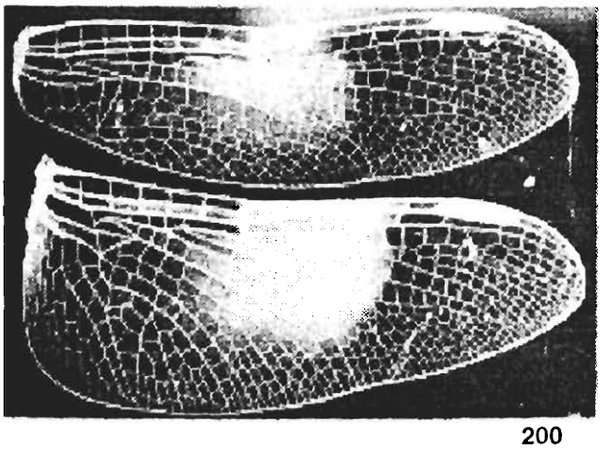
197



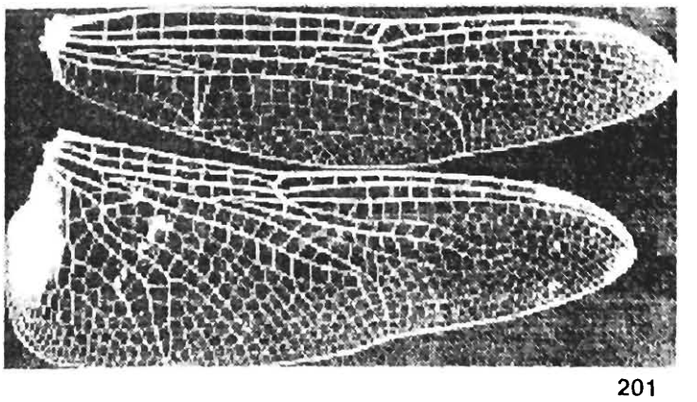
198



199



200



201

Fig. 194-201. 194. Fore and hindwings of *Brachydiplax sobrina* (Rambur); 195. Same of *Acisoma p. panorpoides* Rambur; 196. Same of *Orthetrum s. sabina* (Drury); 197. Same of *Brdinopyga geminata* (Rambur); 198. Fore and hindwings of *Trithemis pallidinervis* (Kirby); 199. Same of *Trithemis aurora* (Burmeister); 200. Same of *Brachythemis contaminata* (Fabr.); 201. Same of *Pantala flavescens* (Fabr.)

Lestes praemorsus decipiens (Kirby)

Lestes praemorsa Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 320.

Lestes praemorsa decipiens Tsuda 1991, *A distributional list of World Odonata, 1991* p. 62.

Distribution : INDIA : *Eastern India* : Mungpoo, Darjeeling, Sibsagar Assam (Laidlaw 1920a); *Southern India* : Coorg, Nilgiris (Fraser 1924b; 1931a); Deccan, Kanara, Malabar (Fraser 1931a).

Elsewhere : ASIA : Burma (Fraser 1929c; Selys 1891); Ceylon (Fraser 1929c); China (Needham 1930); Indonesia (Pinhey 1980); Singapore, Thailand, Nepal, (Tsuda 1991).

Lestes praemorsus sikkima Fraser

Lestes praemorsa sikkima Fraser, 1920, *J. Bombay nat. Hist. Soc.* **33** : 843-844.

Distribution : INDIA : *Eastern India* : Bengal, Kurseong (Fraser 1929c, 1933c; Kimmins 1966).

Lestes praemorsus praemorsus Selys

Lestes praemorsa Selys, 1862, *Bull. Acad. Belg.* (2) **13** : 320.

Distribution : INDIA : *Eastern India* : Arunachal Pradesh, Assam, West Bengal (Ram & Prasad 1999); *Northern India* : Western Himalaya (Ram & Prasad 1999); Andaman Island (Ram & Prasad 1999). *Central India* : Sagar (Srivastava & Suri Babu 1997).

Elsewhere : ASIA : China, Hongkong, Indonesia, Philippines, Papua New Guinea Taiwan (Tsuda 1991).

Lestes nigriceps Fraser

Lestes nigriceps Fraser, 1924, *Mem. Dept. Agric. India (Ent.)* **(8)** : 7.

Distribution : INDIA : *Eastern India* : Pusa, Bihar (Fraser 1930; 1933c).

Lestes thoracicus Laidlaw

Lestes thoracica Laidlaw, 1920, *Rec. Indian Mus.* **19** : 152-153.

Distribution : INDIA : *Eastern India* : Bengal, Chilka Lake, Bihar, Pusa (Fraser 1930, 1933c) *Northern India* : Uttar Pradesh, Agra, Oudh (Laidlaw 1920a). *Central India* : Bastar (Prasad 1996a). *Western India* : Gujarat (Prasad 1984).

Elsewhere : ASIA : Bangladesh, Pakistan, Thailand (Tsuda 1991).

Family SYNLESTIDAE

Genus *Megalestes* Selys

Megalestes Selys, 1862, *Bull. Acad. Belg.* (2) **1B** : 293.

Megalestes irma Fraser

Megalestes irma Fraser, 1926 *J. Darjeeling nat. Hist. Soc.* pp. 32, 38.

Distribution : INDIA : *Eastern India* : Sikkim (Fraser 1929c, 1933c); Mizoram (Prasad 1997c).

Superfamily COENGRIONOIDEA

Family MEGAPODAGRIONIDAE

Genus *Burmarigiolestes* Kennedy

Burmargiolestes Kennedy, 1925, *Bull. Mus. Comp. Zool. Harvard* **67** : 298.

Distribution : India, Burma, Laos, Thailand

Burmargiolestes laidlawi Lieftinck

Argiolestes melanothorax Selys, 1862, *Bull. Acad. Belg.* (2) **16** : 38.

Burmargiolestes melanothorax, Fraser, 1933, *Fauna Brit. India, Odon.* 1 : 90

Burmagriolestes laidlawi Lieftinck, 1960, *Mem. Soc. ent. ital* 38 fasc. (Mem. Gridelli) : 236.

Distribution : INDIA : *Eastern India* : Darjeeling, Gopaldhara (Laidlaw 1917b); Assam, Sikkim (Fraser 1931b; 1933c).

Family PLATYSTICTIDAE

Genus *Protosticta* Selys

Protosticta Selys, 1885, *C.R. Soc. Ent. Belg.* 29 : **145.**

Distribution : China, Hongkong and Oriental Region.

Protosticta himalaica Laidlaw

Protosticta himalaica Laidlaw, 1917, *Rec. Indian Mus.* **13** : 342-343.

Distribution : INDIA : *Eastern India* : Assam, Bengal, Darjeeling, Pashok, Sikkim (Fraser 1931c, 1933c).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Genus ***Drepanosticta*** Laidlaw

Drepanosticta Laidlaw, 1917, *Rec. Indian Mus.* **13** : 359.

Distribution : India, Bangladesh, Sri Lanka, Indonesia, Burma, Thailand, Papua New Guinea Malayasia, Philippines.

Drepanosticta carmaichaeli Laidlaw

Drepanosticta carmaichaeli Laidlaw, 1917, *Rec. Indian Mus.* **13** : 341.

Distribution : INDIA : *Eastern India* : Darjeeling, Kalimpong, Pashoke (Fraser 1931d, 1933c, Laidlaw 1917b); *Northern India* : Uttar Pradesh (Bhasin 195); Garhwal Hills (Prasad 1974).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Drepanosticta polychromatica Fraser

Drepanosticta polychromatica Fraser, 1931, *J. Bombay nat. Hist. Soc.* **35** : 388.

Distribution : INDIA : *Eastern India* : Gopaldhara, Darjeeling (Fraser 1931d, 1933c).

Elsewhere : ASIA : Bangladesh (Tsuda 1991)

Family PROTONEURIDAE

Genus ***Ellattoneura*** Cowley

Disparoheura Selys, 1860, *Bull. Acad. Belg.* **10** : 443.

Distribution : Asia, Africa.

Elattoneura campioni campioni (Fraser)

Disparoneura campioni Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7** : 43-44.

Distribution : INDIA : *Eastern India* : Assam (Fraser 1933c); Margharita (Kimmins 1966).

Elsewhere : ASIA : Burma (Fraser 1933c, Tsuda 1991).

Elattoneura campioni cacharensis (Fraser)

Disparoneura campioni cacharaensis Fraser, 1933, *Fauna Brit. India. Odon.* **1** : 244.

Distribution : INDIA : *Eastern India* : Cachar, Assam (Fraser 1933c).

Genus ***Prodasineura*** Cowley

Caconeura Kirby, 1890, *Cat. Odon.* p. 132

Distribution : Oriental, Ethiopean and Palearctic regions.

Prodasineura odoneli (Fraser)

Caconeura odoneli Fraser, 1923, *J. Bombay nat. Hist. Soc.* **29** : 743

Distribution : INDIA : *Eastern India* : Duars, Bengal (Fraser 1933c).

Elsewhere : ASIA : Bangladesh, Nepal (Tsuda 1991).

Prodasinera verticalis burmanensis (Fraser)

Caconeura verticalis burmanensis, Fraser, 1933, *Fauna Brit. India. Odon*, **1** : 216-218

Distribution : INDIA : *Eastern India* : Mizoram (Prasad 1997c).

Elsewhere : Myanmar (Tsuda 2000). Tsuda (2000) has not recorded from India.

Family PLATYCNEMIDIDAE

Genus ***Calicnemia*** Strand

Calicnemis Selys, 1863, *Bull. Acad. Belg.* (2) 16 : 159.

Calicnemia pulverulans Selys

Calicnemia pulverulans Selys, 1886, *Mem. Cour. Acad. Belg.* **38** : 133.

Material examined : Nagaland : Mon district, 1♂, 8.vi.1991 (Deposited in ERS, ZSI, Shillong)

Distribution : INDIA : *Eastern India* : Sikkim (Fraser 1932b, 1933c; Selys 1891) Nagaland, Darjeeling (Laidlaw 1917b); North Bengal (Fraser 1932b; 1933c); Arnachal Pradesh (Prasad 1997b). *Northern India* : Uttar Kashi and Tehri (Singh & Prasad 1974).

Elsewhere : ASIA : Burma (Selys 1891), Bangladesh, Nepal (Tsuda 1991).

Genus *Coeliccia* Kirby

Coeliccia Kirby, 1890, *Cat. Odon.* p. 128

Distribution : Southeast Asia.

Coeliccia renifera (Selys)

Trichocnemis renifera Selys, 1886, *Mem. Cour. Acad. Belg.* **38** : 119.

Coeliccia renifera Kirby, 1890, *Syn. Cat. Neur. Odon.* p. 128.

Distribution : INDIA : *Eastern India* : Pashok, Darjeeling (Laidlaw 1917); Gopaldahara, Assam, Pashok, Darjeeling (Fraser 1932a, b, 1933c); Arunachal Pradesh (Pradesh 1997b). *Northern India* : Uttar Pradesh (Bhasin 1953).

Elsewhere : ASIA : Nepal (Kiauta 1975; St. Quentin 1970); Bangladesh (Tsuda 1991).

Coeliccia didyma didyma (Selys)

Trichocnemis didyma Selys, 1863, *Bull. Acad. Belg.* (2) **16** : 155.

Coeliccia didyma, Kirby, 1890, *Cat. Odon.* p. 128.

Coeliccia didyma didyma, Asahina 1984, *Cho Cho* 8 (2) :1.

Distribution : INDIA : *Eastern India* : Manipur-Burma border (Asahina 1984a), Meghalaya (Lahiri 1987) *Northern India* Punjab Simla Hill state (Fraser 1933c).

Elsewhere : ASIA : Malayasia, Thailand (Tsuda 1991).

Coeliccia loogali Laidlaw

Coeliccia loogali Laidlaw, 1932, *Rec. Indian Mus.* **34** : 26-28.

Distribution : *Eastern India* : Mizoram (Prasad 1997c).

Elsewhere : Myanmar, Nepal Thailand (Tsuda 2000).

Coeliccia schmidti Asahina

Coeliccia schmidti Asahina, 1984, *Trans. Shikoku Ent. Soc.* **16** : 6.

Distribution : INDIA : *Eastern India* : Khonou, Chabong, Manipur (Asahina 1984c).

Coeliccia rotundata Asahina

Coeliccia rotundata Asahina, 1984, *Trans. Shikoku Ent. Soc.* **16** : 4.

Distribution : INDIA : *Eastern India* : Kongai, Manipur (Asahina 1984a)

Coeliccia vacca Laidlaw

Coeliccia vacca Laidlaw, 1932, *Rec. Indian Mus.* **34** : 11, 15, 16.

Material examined : Nagaland : Zuhenoboto, 1♀, 25.vii.1991 (Deposited in ERS, ZSI, Shillong).

Distribution : INDIA : *Eastern India* : Meghalaya, Tura, Garo Hills (Fraser 1933c). Nagaland (Present record).

Coeliccia rossi Asahina

Coeliccia rossi Asahina, 1985, *Cho Cho* 8(2) : 7.

Distribution : INDIA : *Eastern India* : Ledo, Assam (Asahina 1985a).

Coeliccia svihleri Asahina

1970. *Coeliccia svihleri* Asahina, *Jap. J. Zool.* 16 : 105.

Distribution : INDIA : Assam (Lahiri 2002).

Elsewhere : Myanmar (Tsuda 2000).

Genus *Copera* Kirby

Copera Kirby, 1890, *Syn. Cat. Neur. Odon* p. 129.

Copera superplatypes (Fraser)

Copera superplatypes Fraser, 1927, *Rec. Indian Mus.* **29** : 88-89.

Material examined : Nagaland : Dimapur 1♂, 19.iii.1997.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1927c; 1933b, c, Kimmins 1966).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Family COENAGRIONIDAE

Genus *Ceriagrion* Selys

Ceriagrion Selys, 1876, *Bull. Acad. Belg.* (2) **42** : 525

Ceriagrion coeruleum Laidlaw

Ceriagrion coeruleum Laidlaw, 1919, *Rec. Indian Mus.* 16 : 188-190, Tsuda, 1991, *A distributional list of world Odonata 1991.* p. 26.

Distribution : INDIA : *Eastern India* : Pashok (Laidlaw 1916).

Genus *Aciagrion* Selys

Aciagrion borneense Ris

Aciagrion borneense, Tsuda, 2000, *A distributional list of World Odon.* 2000.

Distribution : Eastern India : Mizoram (Prasad 1997c).

Elsewhere : Indonesia, Malayasia, Philippines, Thailand (Tsuda 2000).

Genus *Enallagma* Chanpentier

Enallagma insulae Fraser

Enallagma insula Fraser, 1920, *Rec. India Mus.* **19** : 32.

Distribution : INDIA : *Eastern India :* Orissa (Fraser 1933c). *N.B.* : Mitra (2000) cast doubt on its actual status.

Genus *Agriocnemis* Selys

Agriocnemis Selys, 1869, *Pollen & Van Dam. Faune Mad., Ins.* p. 24.

Distribution : Old World.

Agriocnemis dabreui Fraser

Agriocnemis dabreui Fraser, 1919, *Rec. Indian Mus.* 16 : 454-455.

Distribution : INDIA : *Eastern India* : Gauhati, Jorhat (Fraser 1933c); *Central India* : Lamta, Balaghat (Fraser 1919); Madhya Pradesh (Srivastava & Suri Babu 1997; Mitra 1995b).

Elsewhere : ASIA : Burma (Fraser 1933c); Malayasia (Lieftinck 1954); Thailand, Vietnam (Tsuda 1991).

Genus *Himalagrion* Fraser

Himalagrion Fraser, 1919, *Rec. Indian Mus.* **16** : 452.

Distribution : India, Bangladesh and Nepal

Himalagrion exaclamatione Fraser

Himalagrion exaclamationis Fraser, 1919, *Rec. Indian Mus.* **16** : 453.

Distribution : INDIA : *Eastern India* : Darjeeling (Fraser 1933c).

Elsewhere : ASIA : Bangladesh, Nepal (Tsuda 1991).

Suborder ANISOZYGOPTERA

Superfamily HETEROPHLEBOIDEA

Family EPIOPHILEBIDAE

Genus *Epiophlebia* Calvert

Epiophlebia, Fraser, 1934, *Fauna Brit. Ind. Odon.* 2 : 151.

Distribution : India, Nepal, Japan.

Epiophlebia laidlawi Tillyard

Epiophlebia laidlawi Tillyard, 1921, *Rec. Indian Mus.* **22** : 93.

Distribution : INDIA : *Eastern India* : Darjeeling (Asahina 1958; Fraser 1934b; Svihla 1962; Tillyard (1921).

Elsewhere : ASIA : Nepal (Asahina 1961a; 1961c; 1963); Phelping river bank (Nepal-Tibet border) (Butler 1997).

Suborder ANISOPTERA

Superfamily AESHNOIDEA

Family GOMPHIDAE

Genus *Onychogomphus* Selys

Onychogomphus Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 30.

Distribution : Old World.

Onychogomphus grammicus (Rambur)

Gomphus grammicus Rambur, 1842, *Ins. Nevrop.* p. 164.

Distribution : INDIA : *Eastern India* : Pusa (Fraser 1924c); *Northern India* : Agra (Fraser 1924c; Laidlaw 1922) *Central India* (Fraser 1934b).

Onychogomphus saundersi Selys

Onychogomphus saundersi Selys, 1851, *Mon. Gomph.* p. 22.

Distribution : INDIA : *Eastern India* : Bengal, N.E. India (Fraser 1924d).

Elsewhere : ASIA : Burma, Bhamo (Selys 1891); Laos (Tsuda 1991).

Onychogomphus duaricus Fraser

Onychogomphus duaricus Fraser, 1924, *J. Bombay nat. Hist. Soc.* 29 : 1001-1002.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1924c); Meghalaya (Lahiri 1987) *Northern India* : Almora (Bhasin 1953).

Elsewhere : ASIA : Bangladesh, Burma, Malayasia, Nepal, Thailand (Tsuda 1991).

Onychogomphus risi (Fraser)

Gomphus risi Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7** : 73-74.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1924c); Darjeeling (Fraser 1923c; 1924c); *Northern India* : Doon valley (Singh & Prasad 1976b). *Eastern India* : Arunachal Pradesh (Prasad 1997b).

Elsewhere : Nepal (Tsuda 1991).

Onychogomphus modestus (Selys)

Onychogomphus modestus Selys, 1878, *Bull. Acad. Belg.* (2) xlvi.

Nepogomphus modestus, Fraser, 1934, *Fauna Brit. India. Odon* 2 : 285.

Distribution : INDIA. *Eastern India* : Bengal, Nagaland (Fraser 1934b).

Elsewhere : Bangladesh, Burma, Nepal (Tsuda 1991).

Onychogomphus cacharicus (Fraser)

Lamelligomphus cacharicus Fraser, 1924, *Mem. Dept. Agric. India (Ent.)* **7** : 81-83.

Distribution : INDIA : *Eastern India* : Cachar, Assam (Fraser 1936; Kimmins 1966), Arunchal Pradesh (Prasad 1997b).

Onychogomphus schmidti Fraser

Onychogomphus bistrigatus Fraser, *Fauna Brit. India. Odon.* **2** : 247-249.

Distribution : *Eastern India* : Arunachal Pradesh (Prasad 1997b); Assam (Fraser 1934b); *Northern India* : Kumaon (Fraser 1934b).

Elsewhere : Nepal (Tsuda 2000).

Genus *Paragomphus* Cowley

Mesogomphus Forster, 1906, *Wiesbaden Jahr. Verh. Natk.* **59** : 323.

Paragomphus lindgreni (Fraser)

Mesogomphus lindgreni Fraser, 1923, *J. Bombay nat. Hist. Soc.* **29** : 65

Distribution : INDIA : *Eastern India* : Darjeeling, Turzum (Fraser 1933a; 1934b).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Paragomphus echinoccipitalis Fraser

Onychogomphus echinoccipitalis Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7** : 74-75.

Paragomphus echinoccipitalis, Tsuda, 1991, *A distributional list of World Odonata, 1991*, p. 107.

Distribution : INDIA : *Eastern India* : Gauhati-Shillong road (Fraser 1924d).

Genus *Macrogomphus* Selys

Macrogomphus Selys, 1857, *Mon. Gomph.* pp. 87, 428

Distribution : Tibet, South and Southeast Asia.

Macrogomphus seductus Fraser

Macrogomphus robustus (M. seductus Fraser nec, *M. robustus)* Laidlaw, 1922, *Rec. Indian Mus.* **24** : 375-376.

Distribution : INDIA : *Eastern India* : Assam, Sibsagar (Laidlaw 1922) : Duars of Bengal (Fraser 1926c).

Elsewhere : ASIA : Bangladesh, Nepal (Tsuda 1991)

Genus *Ictinogomphus* Cowley

Ictinus Rambur, 1842, *Ins. Nevrop.* p. 171

Ictinogomphus angulosus (Selys)

Ictinus angulosis Selys, 1854, *Bull. Acad. Belg.* 21 : 92.

Distribution : INDIA : *Eastern India* : West Bengal, Dum Dum (Laidlaw 1922).

Elsewhere : Bangladesh, Nepal (Tsuda 1991).

Ictinogomphus atrox (Selys)

Ictinus atrox Selys, 1854, *Bull. Acad. Belg.* **21(2)** : 92.

Distribution : INDIA : *Eastern India* : Bihar (Fraser 1923b).

Genus ***Gomphidia*** Selys

Gomphidia Selys, 1854, *Bull. Acad. Belg.* **21** : 86

Distribution : Africa, South and Southeast Asia.

Gomphidia williamsoni Fraser

Gomphidia williamsoni Fraser, 1923, *J. Bombay nat. Hist. Soc.* 29 : 670.

Distribution : INDIA : *Eastern India* : Duars of Bengal (Fraser 1923b; Kimmins 1966).

Elsewhere : ASIA : Bangladesh (Tsuda 1991)

Gomphidia t-nigram Selys

Gomphidia t-nigram Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 86.

Distribution : INDIA : *Eastern India* : Assam, Lakhimpur, U. Dihing. (Bhasin 1953), *Western India* : Poona (Fraser 1923b; Laidlaw 1922); Maharashtra (Prasad 1996b).

Genus ***Anormogomphus*** Selys

Anormogomphus Selys, 1854, *Bull. Acad. Belg.* **21** : 60.

Distribution : India, Pakistan, Afghanistan, Iran, Iraq.

Anormogomphus heteropterus Selys

Anormogomphus heteropterus Selys, 1854, *Bull. Acad. Belg.* **21** : 61.

Distribution : INDIA : *Eastern India* : Bihar (Fraser 1934b); *Northern India* : Kangra (Prasad 1976); Doon Valley (Prasad & singh 1976b); Arunachal Pradesh (Ram & Prasad 1999).

Elsewhere : ASIA : Lahore (Fraser 1934b; Laidlaw 1922).

Genus ***Davidius*** Selys

Davidius Selys, 1878, *Bull. Acad. Belg.* **46** : 667.

Distribution : India, Nepal, Bhutan, China, Thailand, Japan, Korea.

Davidius aberrans senchalensis Fraser

Davidius aberrans senchalensis Fraser, 1926, *J. Bombay nat. Hist. Soc.* **31** : 170.

Distribution : INDIA : *Eastern India* : Darjeeling, Senchal (Fraser 1926a; Kimmins 1966).

Davidius davidi assamensis Laidlaw

Davidius davidi assamensis Laidlaw, 1916, *Rec. Indian Mus.* **12** : 135

Distribution : INDIA : *Eastern India* : Gopaldhara, Darjeeling (Laidlaw 1922); Assam (Laidlaw 1916b).

Genus ***Cyclogomphus*** Selys

Cyclogomphus Selys, 1854, *Bull. Acad. Belg.* **21** : 61.

Distribution : India, Sri Lanka

Cyclogomphus heterostylus Selys

Cyclogomphus heterostylus Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 62.

Distribution : INDIA : *Eastern India* : Darjeeling (Laidlaw 1922); *Western India* : Poona (Fraser 1919a; 1924b; 1926a; Laidlaw 1922); Maharashtra (Prasad 1996b). *Southern India* : Madras (Fraser 1926; Laidlaw 1922); Deccan (Fraser 1931a).

Genus ***Anisogomphus*** Selys

Anisogomphus Selys, 1857, *Mon. Gomph.* p. 102.

Distribution : India, Bangladesh, Nepal, China, Taiwan, Japan, Sri Lanka, Pakistan, Korea, Soviet Russia.

Anisogomphus occipitalis (Selys)

Gomphus occipitalis Selys, 1854, *Bull. Acad. Belg.* **21**(2) : 45.

Distribution : INDIA : *Eastern India* : Darjeeling, Gopaldhara (Laidlaw 1922), Assam (Fraser 1926b), *Northern India* : Dehradun, Kempti falls, Mussorie (Bhasin 1953), Garhwal Hills (Prasad 1974) Uttar Pradesh (Kumar 1982).

Elsewhere : ASIA : Bangladesh, Nepal (Tsuda 1991).

Anisogomphus bivittatus (Selys)

Gomphus bivittatus Selys, 1854, *Bull. Acad. Belg.* 21(2) : 46

Distribution : INDIA : *Eastern India* : Darjeeling, Sikkim, Assam (Fraser 1926b); *Northern India* : Kumaon (Fraser 1926b);

Elsewhere : ASIA : Nepal (Tsuda 1991).

Remark : Laidlaw (1922) described *Tennogomphus* to hold *Anisogomphus bivittatus;* Fraser (1934b) supressed the genus under *Anisogomphus.* But Fraser (1953) raised the genus to a generic rank and declared *Anisogomphus bivittatus* as the type-species. Tsuda (1991) synonymised the genus to *Anisogomphus;* in the present treatise Tsuda (1991) has been followed.

Anisgomphus orites Laidlaw

Anisgomphur orites Laidlaw, 1922, *Rec. Indian Mus.* **24** : 371.

Distribution : INDIA : *Eastern India* : North Bengal, Assam and Sikkim (Fraser 1934b).

Elsewhere : Bangladesh, Nepal (Tsuda 1991).

Genus *Burmagomphus* Williamson

Burmagomphus Williamson, 1907, *Proc. U.S. Nat. Mus.* **33** : 275.

Distribution : India, Burma, China, Indonesia, Laos, Malayasia, Thailand.

Burmagomphus pyramidalis pyramidalis Laidlaw

Burmagomphus pyramidalis Laidlaw, 1922, *Rec. Indian Mus.* **24** : 399-401.

Burmagomphus pyramidalis pyramidalis, Tsuda, 1991, *A distributional list of world Odonata 1991,* p. 92.

Distribution : INDIA : *Eastern India* : Darjeeling, Gopaldhara (Laidlaw 1922); *Western India* : Poona (Laidlaw 1922); Maharashtra (Prasad 1996b). *Southern India* : (Laidlaw 1922); Coorg, Deccan, Malabar (Fraser 1931a).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Burmagomphus hasimaricus Fraser

Burmagomphus hasimaricus Fraser, 1926, *J. Bombay nat. Hist. Soc.* **31** : 411.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1926b; Kimmins 1966).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Burmagomphus sivalikensis Laidlaw

Burmagomphus sivalikensis Laidlaw, 1922, *Rec. Indian Mus.* **24** : 401-402.

Distribution : INDIA : *Eastern India* : North Bengal; Hasimara (Fraser 1926b); *Northern India* : Dehra Dun (Fraser 1926b; Laidlaw 1922).

Genus *Merogomphus* Martin

Merogomphus Martin, 1904, *Mission Parie. Neuropt.* **3** : 214.

Distribution : India, Bangladesh, Burma, China, Malayasia, Thailand, Taiwan, Vietnam.

Merogomphus martini (Fraser)

Platygomphus martini Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **7** : 68.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1922d; 1925a; Kimmins 1966) Shillong (Fraser 1925a); Meghalaya (Lahiri 1987); Mizoram (Prasad 1997c).

Elsewhere : Bangladesh (Tsuda 1991).

Genus *Asiagomphus* Asahina

Asiagomphus Tsuda, 1991, *A distributional list of World Odonata, 1991* p. 90.

Distribution : Burma, China, Hongkong, India, Japan, Korea, Malayasia, Soviet Russia, Taiwan, Vietnam.

Type-species : *Asiagomphus melanops* (Selys)

Asiagomphus odoneli (Fraser)

Gomphus odoneli Fraser, 1922, *Rec. Indian Mus.* **26** : 420-421.

Asiagomphus odoneli, Tsuda, 1991, *A distributional list of world Odonata, 1991,* p. 91.

Distribution : INDIA : *Eastern India* : Hasimara, Bengal (Fraser 1922b, 1925b, 1934b).

Genus *Platygomphus* Selys

Platygomphus Selys, 1854, *Bull. Acad. Belg.* **91** : 44.

Distribution : India, Bangladesh, Nepal, Burma, Thailand.

Platygomphus dolabratus Selys

Platygomphus dolabratus Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 44.

Distribution : INDIA : *Eastern India* : Bengal, Bihar (Fraser 1926b); Pusa (Bhasin 1953); *Northern India* : Allahabad (Bhasin 1953).

Genus *Megalogomphus* Campion

Megalogomphus Campion, 1923, *Ann. Mag. Nat. Hist.* (9) **12** : 668.

Distribution : India, Bangladesh, Sri Lanka, Vietnam, Indonesia, Thailand, Malayasia, China.

Megalogomphus smithi (Selys)

Heterogomphus smithi Selys, 1854, *Bull. Acad. Belg.* **21** : 29.

Distribution : INDIA : *Eastern India* : Cachar (Fraser 1924e); Sikkim (Fraser 1923b).

Elsewhere : ASIA : Bangladesh : Sylhet (Fraser 1923b, 1934b), China (Tsuda 1991).

Megalogomphus flavicolor (Fraser)

Heterogomphus flavicolor Fraser, 1923, *J. Bombay nat. Hist. Soc.* **29** : 678.

Distribution : INDIA : *Eastern India* : Bihar (Fraser 1923b) Duars of Bengal (Fraser 1934b).

Genus *Perissogomphus* Laidlaw

Perissogomphus Laidlaw, 1922, *Rec. Indian Mus.* **24** : 383.

Distribution : India, Nepal

Perissogomphus stevensi Laidlaw

Perissogomphus stevensi Laidlaw, 1922, *Rec. Indian Mus.* **24** : 384-387.

Distribution : INDIA : *Eastern India* : Darjeeling, Gopaldhara (Fraser 1926c; Laidlaw 1922); Assam (Fraser 1922, 1926c), Meghalaya (Lahiri 1987).

Elsewhere : Nepal (Tsuda 1991).

Family AESHNIDAE

Genus *Gynacantha* Rambur

Gynacantha bainbriggei Fraser (Fig. 132)

Material examined : Calcutta, 1♂, 14.vii.1978; *coll.* A. K. Mukherjee.

Gynacantha bainbriggei Fraser, 1922, *Mem. Dept. Agric. India (Ent.)* **8** : 75-76.

Distribution : INDIA : *Eastern India* : Calcutta (Present record). Past records : Assam, Gauhati (Fraser 1922e).

Elsewhere : Burma (Kimmins 1966).

Remark : New record from West Bengal. (Gupta, De & Mitra 1995).

Gynacantha odoneli Fraser

Gynacantha odoneli Fraser, 1922, *J. Bombay nat. Hist. Soc.* **28** : 909-910.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1922e).

Gynacantha albistyla Fraser

Gynacantha albistyla Fraser, 1927, *Rec. Indian Mus.* **29** : 75-76.

Distribution : INDIA : *Eastern India* : Pusa (Kimmins 1966).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Gynacantha basiguttata Selys

Gynacantha basiguttata Selys, 1882, *An. Soc. Espan.* **11** : 20.

Distribution : INDIA : *Eastern India* : Assam, Sibsagar, Bengal (Fraser 1936a).

Elsewhere : ASIA : Bangladesh, Burma, Indonesia, Malayasia, Philippines, Thailand (Tsuda 1991).

Gynacantha biharica Fraser

Gynacantha biharica Fraser, 1927, *Rec. Indian Mus.* **29** : 74-75.

Distribution : INDIA : *Eastern India* : Bihar, Pusa (Fraser 1927c).

Gynacantha arnaudi Asahina

Gynacantha arnaudi Asahina, 1984, *Cho Cho* **7** : 2-8.

Distribution : INDIA : *Eastern India* : Assam, West Digboi (Asahina 1984b).

Gynacantha millardi Fraser

Gynacantha millardi Fraser, 1936, *Fauna Brit. India Odon.* **3** : 105.

Distribution : INDIA : *Eastern India :* Orissa (Lahiri & Das 1991). *Western India* : Poona (Fraser 1936, Lahiri & Das 1991).

Genus *Anax* Leach

Anax, Leach, 1815, *Edinb. Encycl.* **9** : 137.

Anax nigrofasciatus nigrolineatus Fraser

Anax nigrolineatus Fraser, 1935, *J. Darjeeling Nat. Hist. Soc.* **10** : 23-25.

Distribution : INDIA : *Eastern India* : Sikkim, Kurseong, Mungpoo, Turzum, Darjeeling (Fraser 1935d); Nagaland (Bhasin 1953); *Northern India* : Uttar Pradesh (Kumar 1982); Almora (Bhasin 1953); Dehra Dun (Kumar & Mitra 1998)

Elsewhere : ASIA : China (Needham 1930); Nepal (Kiauta 1975). Bhutan, Thailand (Tsuda 1991).

Anax imaculifrons Rambur

Anax imaculifrons Rambur, 1842, *Ins. Névrop* P. 189; Fraser 1936, *Fauna Briti India. Odon* 3 : 145.

Distribution : Eastern India : Sikkim (Prasad 1996b); *Western India :* Maharashtra (1996b); Bombay (Fraser 1936a); *Southern India :* Eastern Ghats (Fraser 1936a).

Genus *Oligoaeschna* Selys

Jagoria Karsch, 1889, *Ent. Nachr.* **15** : 238.

Oligoaeschna Selys, 1889, *Ann. Mus. Civ. Genova* 27 : 470.

The name *Jagoria* was preoccupied in Crustacea hence Cowley (1934) replaced it by *Oligoaeschna* and Lieftinck (1968) supported it.

Distribution : India, Malayasia, Singapore, Indonesia, Japan, Bangladesh, Taiwan, Philippines.

Oligoaeschna martini (Laidlaw)

Jagoria martini Laidlaw, 1921, *Rec. Indian Mus.* **22** : 76-77.

Distribution : INDIA : *Eastern India* : Darjeeling (Fraser 1922d; Laidlaw 1921), Meghalaya (Lahiri 1987).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Oligoaeschna speciosa Karube

Oligoaeschna speciosa Karube, 1998, *Bull. Kanagawa prefect Mus. (Nat. Sci.)* no **27** : 81-83.

Distribution : INDIA : *Eastern India* : Darjeeling (Karube 1998).

Genus *Periaeschna* Martin

Periaeschna Martin, 1909, *Cat. Coll. Selys (Aeschnines) fasc.* **20** : 7

Distribution : India, Nepal, Bangladesh, China, Vietnam, Taiwan, Malayasia.

Periaeschna unifasciata Fraser, 1935

Periaeschna unifasciata Fraser, 1935, *J. Darjeeling Nat. Hist. Soc.* **10** : 25-26.

Distribution : INDIA : *Eastern India* : Darjeeling, Mungpoo (Fraser 1935d, Kimmins 1969).

Elsewhere : ASIA : Nepal (Tsuda 1991).

Periaeschna magdalena Martin

Periaeschna magdalena Martin, 1909, *Cat. Coll. Selys (Aeschnines)* fasc. **20** : 157.

Distribution : INDIA : *Eastern India* : Assam, Bengal, Garo Hills, Sikkim (Fraser 1936a).

Elsewhere : ASIA : Burma, Tonkin (Fraser 1936a, Martin 1909b) Taiwan (Lieftinck *et. al.* 1984); Bangladesh, China, Vietnam (Tsuda 1991).

Genus *Tetracanthagyna* Selys

Tetracanthagyna Selys, 1883, *Bull. Acad. Belg.* **5** : 744.

Distribution : India, Philippines, Burma, Thailand, Malayasia, Singapore, Bangladesh, Vietnam, Laos, Indonesia.

Tetracanthagyna waterhousei MacLachlan

Tetracanthagyna waterhousei MacLachlan, 1898, *Trans. Ent. Soc. Lond.* Part **4** : 441-442.

Distribution : INDIA : *Eastern India* : Margharita forest of Duars of Bengal (Fraser 1933a). Meghalaya (Lahiri 1987).

Elsewhere : ASIA : Burma, Borneo, Tonkin (Martin 1909a); Hongkong, Laos, Malayasia, Thailand, Vietnam, Bangladesh (Tsuda 1991).

Genus *Cephalaeschna* Selys

Cephalaeschna Selys, 1883, *Bull. Acad. Belg.* **5** : 739.

Distribution : India, Burma, Nepal, China, Afghanistan, Bhutan, Taiwan.

Cephalaeschna masoni (Martin)

Caliaeschna masoni Martin, 1909, *Cat. Coll. Selys (Aeschnines)* fasc. **19** : 111.

Distribution : INDIA : *Eastern India* : Assam (Asahina 1955; Fraser 1922d); Darjeeling (Asahina 1955).

Elsewhere : ASIA : Nepal (Asahina 1955); Pakistan (Khaliq & Maulla 1999).

Cephalaeschna acutifrons (Martin)

Caliaeschna acutifrons Martin, 1909, *Cat. Coll. Selys (Aeschnines)* fasc. **19** : 110, 111.

Distribution : INDIA : *Eastern India* : Bengal, Assam (Fraser 1922d); Darjeeling, Tonglu (10,000') (Kimmins 1966) Sikkim (Fraser 1936a); Sikkim (Prasad & Varshney 1995).

Elsewhere : ASIA : China (Klots 1947, Needham 1930); Burma, Nepal (Tsuda 1991).

Cephalaeschna orbifrons Selys

Cephalaeschna orbifrons Selys, 1883, *Bull. Acad. Belg.* (3) vol. **5** : 739.

Distribution : INDIA : *Eastern India* : Bengal, Darjeeling (Fraser 1922d).

Elsewhere : ASIA : Nepal (Kiauta 1975).

Genus *Petaliaeschna* Fraser

Petaliaeschna Fraser, 1927, *Rec. Indian Mus.* **29** : 172.

Distribution : India, China

Petaliaeschna fletcheri Fraser

Petaliaeschna fletcheri Fraser, 1927, *Rec. Indian Mus.* **29** : 73-74.

Distribution : INDIA : *Eastern India* : Shillong, Sikkim (Fraser 1927c); Assam (Fraser 1936a).

Remarks : Yeh (1999) contradicted Asahina's (1981) doubt on its status.

Genus *Gynacanthaeschna* Fraser

Gynacanthaeschna Fraser, 1922, *J. Bombay nat. Hist. Soc.* **28** : 110.

Distribution : India, Bangladesh, Nepal.

Gynacanthaeschna sikkima (Karsch)

Cephalaeschna sikkima Karsch, 1891, *Ent. Nachr.* **17** : 6-7.

Distribution : INDIA : *Eastern India* : Sikkim, Cherrapunji, Gopaldhara, Assam (Fraser, 1922d) : *Northern India* : Uttar Pradesh (Bhasin 1953).

Elsewhere : ASIA : Bangladesh, Nepal (Tsuda 1991).

Genus *Polycanthagyna* Fraser

Polycanthagyna Fraser, 1933, *J. Bombay nat. Hist. Soc.* **36** : 463.

Distribution : India, Bangladesh, China, Nepal, Thailand, Taiwan, Vietnam, Korea, Japan.

Polycanthagyna ornithocephala (MacLachlan)

Aeshna ornithocephala MacLachlan, 1896, *Ann. Mag. Nat. Hist.* (6) : **17** : 368.

Distribution : INDIA : *Eastern India* : Darjeeling, North Assam (Fraser 1922c); *Northern India* : Sabathu, near Simla (MacLachlan 1896b).

Elsewhere : ASIA : Tibet, Moupin (Kimmins 1969); Bangladesh, Nepal, Thailand, Taiwan, Vietnam (Tsuda 1991).

Genus *Aeshna* Fabricius

Aeshna Fabricius, 1775, *Syst. Ent.* p. 424.

Distribution : Cosmopolitan

Aeshna petalura petalura Martin

Aeshna petalura Martin, 1909, *Cat. Coll. Selys (Aeschnines)* fasc. **18** : 78-79.

Distribution : INDIA : *Eastern India* : Darjeeling, Khasi Hills (Martin 1908; Fraser 1922c); Phulloth (11,500') (Fraser 1933a). Meghalaya (Lahiri 1987).

Elsewhere : ASIA : Bhutan, Nepal (Tsuda 1991).

Superfamily CORDULEGASTEROIDEA

Family CORDULEGASTERIDAE

Genus ***Anotogaster*** Selys

Anotogaster Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 101.

Distribution : Oriental and Palacarctic regions.

Anotogaster gregoryi Fraser

Anotogaster gregoryi Fraser, 1929, *Mem. Indian Mus.* **9** : 90-92.

Distribution : INDIA : *Eastern India* : Assam (Vick 1989).

Elsewhere : ASIA : Yunnan (Fraser 1929d) China, Nepal, Thailand (Vick 1989).

Anotogester basalis palampurensis Fraser

Anotogaster basalis palampurensis Fraser, 1929, *Mem. Indian Mus.* **9** : 88-89.

Distribution : INDIA : *Eastern India* : Sikkim (Fraser 1929d, 1936a).

Elsewhere : Nepal (Fraser 1929d, 1936a).

Genus ***Chlorogomphus*** Selys

Chlorogomphus Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 98-99

Distribution : Oriental and Palacarctic regions.

Chlorogomphus fraseri St. Quentin

Chlorogomphus fraseri St. Quentin, 1936, *Knowia* 15(1/2) : 103-104.

Distribution : INDIA : *Eastern India* : Darjeeling (St. Quentin 1936), Meghalaya (Lahiri 1987).

Chlorogomphus selysi Fraser

Chlorogomphus selysi Fraser, 1929, *Mem. Indian Mus.* **19**(3) : 158-160.

Distribution : INDIA : *Eastern India* : Darjeeling, Mungpoo (Kimmins 1966).

Elsewhere : Nepal (Tsuda 1991).

Chlorogomphus mortoni Fraser

Chlorogomphus mortoni Fraser, 1936, *Proc. R. ent. Soc. Lond.* (B) **5** : 224.

Distribution : INDIA : *Eastern India* : Sikkim (Fraser 1936b).

Genus ***Cordulegaster*** Leach

Cordulegaster Leach, 1815, *Edinb. Encycl.* **9** : 130.

Distribution : Cosmopolitan

Cordulegaster brevistigma brevistigma (Selys)

Thecagaster brevistigma Selys, 1854, *Bull. Acad. Belg.* (2) **21** : 103.

Distribution : INDIA : *Eastern India* : Darjeeling, Turzum (Fraser 1923a); *Northern India* : Chakrata, Chachpur (Bhasin 1953).

Elsewhere : ASIA : Nepal, Pakistan (Tsuda 1991).

Genus ***Neallogaster*** Cowley

Allogaster Selys, 1878, *Bull. Acad. Belg.* **46** : 684.

Distribution : India, Nepal, Bangladesh, Afghanistan

Neallogaster hermionae (Fraser)

Allogaster hermionae Fraser, 1927, *Rec. Indian Mus.* **29** : 76-77.

Distribution : INDIA : *Eastern India* : Darjeeling (Fraser 1927c; Kimmins 1966) : Kameng, Arunachal Pradesh (Asahina 1982a).

Elsewhere : ASIA : Nepal (Asahina 1982).

Neallogaster latifrons (Selys)

Allogaster latifrons, Fraser, 1936, *Fauna Brit. India. Odon.* 3 : 38

Distribution : INDIA : *Eastern India* : Tongloo, Darjeeling (West Bengal), Nathui La, Phulloth, (Fraser 1936a)

Elsewhere : Bangladesh, Nepal (Tsuda 1991).

Superfamily LIBELLULOIDEA

Family CORDULIIDAE

Genus ***Macromia*** Rambur

Macromia Rambur, 1842, *Ins. Nevrop.* p. 137

Distribution : Cosmopolitan

Macromia pallida Fraser

Macromia pallida Fraser, 1924, *Rec. Indian Mus.* **26** : 456-457.

Distribution : INDIA : *Eastern India* : Hasimara, Duars of Bengal (Fraser 1924b).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Macromia flavovittata Fraser

Macromia flavovittata Fraser, 1935, *Rec. Indian Mus.* **37** : 326-328.

Distribution : INDIA : *Eastern India* : Mungpu, Darjeeling (Kimmins 1966).

Macromia flavocolorata Fraser

Macromia flavocolorata Fraser, 1922, *J. Bombay nat. Hist. Soc.* **28** : 702.

Distribution : INDIA : *Eastern India* : Haldeebari Tea estate, Duara of Bengal (Fraser 1933a); *Southern India* : Coorg, Malabar (Fraser 1931a).

Elsewhere : ASIA : Nepal (Vick 1989), Burma, China, Laos, Thailand, Vietnam (Tsuda 1991).

Macromia flavicincta Selys

Macromia flavicincta Selys, 1874, *Bull. Acad. Belg.* (2) **37** : 25.

Distribution : INDIA : *Eastern India* : Bengal (Martin 1906), Darjeeling (Fraser 1921b); Deccan (Fraser 1931a); *Western India* : Poona, Bombay, Mahabaleswar (Fraser 1921b); Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Bangladesh (Tsuda 1991).

Macromia cingulata Rambur

Macromia cingulata Rambur, 1842, *Ins. Nevrop.* p. 37.

Distribution : INDIA : *Eastern India* : Bengal (Fraser 1921b; Martin 1906); *Southern India* : Coorg, Deccan, Kanara, Malabar (Fraser 1931a); *Western India* : Bombay, Mahabaleswar, Poona (Fraser 1921b). *Central India* : Bàstar (Prasad 1996a).

Elsewhere : Nepal, Vietnam (Tsuda 1991).

Genus *Epophthalmia* Burmeister

Epophthalmia Burmeister, 1839, *Handb. Ent.* **2** : 844.

Distribution : South and Southeast Asia, China, Japan.

Epophthalmia frontalis frontalis Selys

Epophthalmia frontalis Selys, 1871, *Bull. Acad. Belg.* (2) **31** : 530.

Distribution : INDIA : *Eastern India* : Bhubaneswar (Dasgupta 1957) *Western India* : Poona (Fraser 1919a); Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Malayasia, Nepal, Thailand (Tsuda 1991)

Genus *Hemicordulia* Selys

Hemicordulia Selys, 1870, *C.R. Soc. Ent. Belg.* **14** : 5.

Distribution : Old world

Hemicordulia asiatica Selys

Hemicordulia asiatica Selys, 1878, *Bull. Acad. Belg.* (2) **45** : 186

Distribution : INDIA : *Eastern India* : Bengal (Martin 1906, Pinhey 1981); Dejoo, North Lakhimpur, Upper Assam (Laidlaw 1914); Shillong, Khasia Hills (Fraser 1921b); *Southern India* : Coorg, Kodaikanal, Nilgiris, Palnis, Ooty (Fraser 1924b); Annaimalai (Fraser 1931a). *Western India* : Maharashtra (Prasad 1996b).

Elsewhere : ASIA : Burma, Sri Lanka (Tsuda 1991) AFRICA ; Malawi (Pinhey 1966); Uganda (Pinhey 1981).

Genus *Idionyx* Hagen Selys

Idionyx Hagen, 1867, *Verh. zool. bot Ges. Wien* 17 : 58.

Distribution : India, Myanmar, Java, Sumatra, Borneo, China, Malayasia and the Philippines.

Idionyx imbricata Fraser

Idionyx imbricata, Tsuda, 1991, *A dist. list of world Odonata* P. 135.

Distribution : *Eastern India* : Mizoram (Prasad 1997c); Shillong (Fraser 1936a).

Family LIBELLULIDAE

Genus *Lyriothemis* Brauer

Lyriothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 180.

Lyriothemis acigastra (Selys)

Calothemis acigastra Selys, 1878, *Mitt. Mus. Dresden* p. 309.

Distribution : INDIA : *Eastern India* : Abor Hills (Laidlaw 1914); Bengal (Fraser 1918b).

Elsewhere : ASIA : Bangladesh, Burma, China (Tsuda 1991).

Genus *Agrionoptera* Brauer

Agrionoptera Brauer, 1864, *Verh. zool.-bot. Ges. Wien* **14** : 163.

Distribution : Old world

Agrionoptera insignis (Rambur)

Agrionoptera insignis dorothea Fraser, 1927, *Rec. Indian Mus.* **29** : 65-66.

Distribution : INDIA : *Eastern India* : Assam, Bengal (Fraser 1918a); Duars, Gopaldhara, Darjeeling (Fraser 1927c) Hasimara (Kimmins 1966).

Elsewhere : ASIA : Burma, Malayasia (Fraser 1918a); Indonesia, Japan, Thailand (Tsuda 1991).

Genus *Amphithemis* Selys

Amphithemis Selys, 1891, *Ann. Mus. Civ. Genova* (10) 30 : 454

Amphithemis vacillans (Selys)

Amphithemis vacillans Selys, 1891, *Ann. Mus. Civ. Genova* (10) **30** : 457

Distribution : INDIA : *Eastern India* : Assam (Laidlaw 1914; 1915b); Margharita forest (Fraser 1933a).

Elsewhere : ASIA : Burma, Bhamo, Palon, Carin (Selys 1891); Bangladesh (Tsuda 1991).

Genus *Nannophya* Rambur

Nannophya Rambur, 1842, *Ins. Nevrop.* p. 26.

Distribution : Australia, India, Nepal, Burma, China, Indonesia, Japan, Malayasia, Philippines, Singapore.

Nannophya pygmaea Rambur

Nannophya pygmaea Rambur, 1842, *Ins. Nevrop.* p. 27

Distribution : INDIA : *Eastern India* : North Lakhimpur (Laidlaw 1914; Fraser 1921a); Meghalaya (Lahiri 1987).

Genus *orthetrum* Newman

Orthetrum chrysis (Selys)

Libellula testaced race *Chrysis* Selys, 1891, *Ann. Mus.civ. Genova* 30 : 462.

Distribution : Eastern India : Bengal, Assam (Fraser 1936a); *Western India :* Maharashtra (Prasad 1996b). *Southern India :* West coast of India (Fraser 1936a).

Elsewhere : Ceylon to Celebes, Borneo (Fraser 1936a).

Elsewhere : ASIA : Burma (Fraser 1921a), China (Needham 1930); Pakistan (Northwest India) Fraser 1921a); Nepal, Burma; Indonesia, Japan, Malayasia, Philippines, Singapore, Thailand, Taiwan, (Tsuda 1991), AUSTRALIA (Tsuda 1991).

Genus *Crocothemis* Brauer

Crocothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 367.

Distribution : Old and New World.

Crocothemis erythraea erythrea (Brulle)

Libellula erythrea Brulle, 1832, *Exped. Mooree* vol. iii (1) p. 102.

Distribution : INDIA : *Eastern India* : Assam (Schneider 1985b), Calcutta (Peters 1981).

Elsewhere : Widely distributed in the Old World.

Genus *Neurothemis* Brauer

Neurothemis Brauer, 1867, *Verh. zool.-bot.* Ges. Wien 17 : 6.

Distribution : Old World.

Nuerothemis intermedia degener Selys

Neurothemis degener Selys, 1879, *Ann. Mus. Civ. Genova,* 14 : 290.

Distribution : INDIA : *Eastern India :* Assam, Bengal, Sikkim (Fraser 1936, 1936a).

Elsewhere : Bangladesh, Myanmar, Nepal (Tsuda 2000).

Genus *Sympetrum* Newman

Sympetrum Newman, 1833, *Ent. Mag.* **1** : 511.

Distribution : Cosmopolitan

Sympetrum orientale (Selys)

Diplax orientale Selys, 1883, *Ann. Soc. Ent. Belg.* **27** : 140.

Distribution : INDIA : *Eastern India* : Sadiya, NE. Assam (Laidlaw 1914), Bengal, Khasia Hills (Fraser 1919c); Arunachal Pradesh (Prasad 1997b).

Elsewhere : ASIA : China, Nepal (Tsuda 1991).

Genus *Rhyothemis* Hagen

Rhyothemis Hagen, 1867, *Stett. Ent. Zeit.* **28** : 232.

Distribution : Old World.

Rhyothemis obsolescens Kirby

Rhyothemis obsolescens Kirby, 1889, *Trans. zool. Soc. Lond.* **12** : 321.

Distribution : INDIA : *Eastern India* : Dejoo, Assam (Fraser 1936a).

Elsewhere : ASIA : Burma, Mergui, King Island, Borneo, Sumatra (Fraser 1924e); Malayasia, Singapore, Thailand (Tsuda 1991).

Rhyothemis triangularis Kirby

Distribution : Eastern India : Assam, Margharita (Fraser 1936a); *Southern India :* Coorg, Malabar, Palghat (Fraser 1936a).

Elsewhere : Borneo, Java, Malayasia Sumatra, Srilanka (Fraser 1936a).

Genus *Onychothemis* Brauer

Onychothemis Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 170.

Distribution : India, Philippines, Thailand, Indonesia, Malayasia, Burma, Vietnam, Taiwan, Madagascar.

Onychothemis testacea ceylanica Ris

Onychothemis tonkiensis ceylanica Ris, 1912, *Cat. Coll. Selys* fasc. **14** : 832, 835.

Distribution : INDIA : *Eastern India* : Duars of Bengal, (Fraser 1924b), *Southern India* : Annaimalai, Bolovumpattis, Coorg, Kanara, Malabar, Nilgiris (Fraser 1931a).

Elsewhere : ASIA : Sri Lanka (Tsuda 1991).

Genus *Pseudotramea* Fraser

Pseudotramea, Fraser, 1920, *J. Bombay nat. Hist. Soc.* **27** : 149.

Distribution : India, Nepal.

Pseudotramea prateri Fraser

Pseudotramea prateri Fraser, 1920, *J. Bombay nat. Hist. Soc.* **27** : 149.

Distribution : INDIA : *Eastern India* : Darjeeling (Kimmins 1966).

Elsewhere : ASIA : Nepal, (Kiauta 1975, St. Quentin 1970) Thailand (Tsuda 1991).

Genus *Camacinia* Kirby

Camacinia Kirby, 1889, *Trans. Zool. Soc. Lond.* **12** : 260.

Distribution : India, Burma, Malayasia, Indo-China, Philippines, Sundaic Archipelago, New Guinea, Australia, Pacific Islands.

Camacinia gigantea (Brauer)

Neurothemis gigantea Brauer, 1867, *Verh. zool.-bot. Ges. Wien.* **17** : 8.

Material examined : Nagaland : Dimapur 1♂ 18.iii.1997.

Distribution : INDIA : *Eastern India* : Assam, Bengal (Fraser 1936a); Great Nicobar Island (Mitra 1995a).

Elsewhere : ASIA : Burma, Borneo, Java, Malayasia,Philippines (Fraser 1936a); Thailand, Vietnam, New-Guinea (Tsuda 1991).

Genus *Hydrobasileus* Kirby

Hydrobasileus Kirby, 1889, *Trans. Zool. Soc. Lond.* 12 : 258 & 266; Fraser, 1936, *Fauna Brit. India. Odon.* **3** : 428-430; Tsuda, 2000, *Adistributional list of world Odonata, 2000.* p. 158.

Distribution : Oriental, Australian region and Formosa.

Hydrobasileus croceus (Brauer)

Hydrobasileus croceus, Fraser, 1936, *Fauna Brit. India Odon.* **3** : 429-430.

Material examined : 1♀, Orissa, Satapad, Puri, 24.iii.1997.

Distribution : Present record : Orissa. *Past records : Eastern India :* Orissa (Chakraborty *et. al.* 1999), Assam, Meghalaya (Lahiri 1987); *Central India :* Madhya Pradesh (Lahiri 1987); *Western India :* Maharashtra (Lahiri 1987); *Northern India :* Rajasthan (Lahiri 1987); *Southern India :* Andhra Pradesh (Joseph & Satyarani 1988); Coorg. Malabar (Fraser 1936a).

Elsewhere : Bangladesh, China, Hongkong, Indonesia, Japan, Kampuchea, Laos, Myanmar, Malayasia, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam (Tsuda 2000).

DOUBTFUL AND INCORRECT RECORDS

Name of species	Family
Coeliccia dorothea Fraser	PLATYCNEMIDIDAE
Fraser (1933a) described the species from Huldibari Tea estate, Duars of North Bengal. Its name is not available in the Fauna of British India.	
Orthetrum triangulare melania Selys	LIBELLULIDAE
Fraser (1924e) reported this from Hasimara Duars of North Bengal and Yunnan but did not mention it in the Fauna of British India.	
Neurothemis dispersalis Kirby	LIBELLULIDAE
Fraser (1924e) considered it to occur in Sibsagar, Assam but he did not report it in the Fauna of British India.	
Camacinia harterti Karsch	LIBELLULIDAE
Fraser (1920b) reported it from Bengal and Sikkim	Fraser (1936a) corrected it as *C. gigantea* (Brauer)

INDETERMINATE SPECIES RECORDED EARLIER BUT NOT REPORTED IN THE FAUNA OF BRITISH INDIA.

Name of Genus	Locality	Authority
Pseudagrion sp.	Dibrugarh, Assam	Laidlaw, F.F. (1914)
Agriocnemis sp.	Dejoo, Assam	Laidlaw, F.F. (1914)
Leptogomphus sp.	Dejoo, Assam	Laidlaw, F.F. (1914)
Gynacantha sp.	Dejoo, Assam	Laidlaw, F.F. (1914)
Rhyothemis sp.	Dejoo, Assam	Laidlaw, F.F. (1914)
Lestes sp.	Darjeeling	Fraser, F.C. (1919b)

DISCUSSIONS

Richness and Diversity

The area supports two hundred nintyfour (294) species and subspecies distributed over one hundred ten (112) genera, seventeen (17) families and three (3) suborders. According to Tsuda (1991) four hundred ninty four (494) and in present count the number stands fivehundred one (501) species and subspecies occur in India and ninehundred sixty (960) in the continental Southeast Asia. In the present treatise and in other communications the author has synonymised nine (9) species and has added two (2) new species and three (3) indetriminate forms. Thus the total number of forms occurring in India is fivehundred one (501) and in the continental Southeast Asia is nine hundred sixty (960). Therefore the number of forms occurring in the area is about 59% of the total Indian population and about 29.8% or 30% of the continental South East Asia.

CONTRIBUTION OF SUBORDERS, FAMILIES AND GENERA IN THE COMPOSITION OF THE FAUNA

Suborder ZYGOPTERA

Family CALOPTERYGIDAE

Neurobasis (1sp.), *Vestalis* (3 sp.), *Echo* (1 sp.), *Matrona* [1 sp. (2 sub. sp.)] *Caliphaea* (1 sp.). Family EUPHAEIDAE : *Bayadera* (2 sp.), *Anisopleura* (3 sp.), *Euphaea* (3 sp.), *Schmidtiphaea* (1 sp.), Family AMPHIPTERYGIDAE : *Philoganga* (1 sp.). Family CHLOROCYPHIDAE : *Rhinocypha* (16 sp.), *Libellago* (1 sp.). Family LESTIDAE : *Lestes* (13 sp.), *Indolestes* (1 sp.). *Orolestes* (1). Family SYNLESTIDAE : *Megalestes* (3 sp.). Family MEGAPODAGRIONIDAE : *Burmargiolestes* (1 sp.) Family PLATYSTICTIDAE : *Protosticta* (1 sp.), *Drepanosticta* (2 sp.), Family PLATYCNEMIDIDAE : *Copera* [3 sp. (2 sub. sp.)] *Calicnemia* (6 sp.) *Coeliccia* (9 sp.) Family PROTONEURIDAE : *Disparoneura* (1 sp.), *Caconeura* (2 sp.), *Ellatoneura* [1 sp. (2 sub. sp.)], *Prodasineura* (2 sp.), Family COENAGRIONIDAE : *Himalagrion* (1 sp.), *Pseudagrion* (7 sp.), *Ceriagrion* (8 sp.), *Cercion* (2 sp.), *Aciagrion* (7 sp.), *Ischnura* [5 sp. (3 sub. sp.)], *Rhodischnura* (1 sp.), *Enallagma* (2 sp.), *Mortonagrion* (1 sp.), *Argiocnemis* (1 sp.), *Agriocnemis* (8 sp.), *Onychargia* (2 sp.).

Suborder ANISOZYGOPTERA : Family EPIOPHLEBIDAE : Epiophlebia (1 sp.), Suborder ANISOPTERA : Family GOMPHIDAE : *Nihonogomphus* (1 sp.), *Onychogomphus* (9 sp.), *Phaenandrogomphus* (1 sp.), *Stylogomphus* (1 sp.), *Paragomphus* (3 sp.), *Macrogomphus* (2 sp.), *Ictinogomphus* (4 sp.), *Gomphidia* (3 sp.), *Anormogomphus* (1 sp.), *Davidius* (2 sp.), *Cyclogomphus* (1 sp.), *Anisogomphus* (3 sp.), *Burmagomphus* (3 sp.), *Merogomphus* (1 sp.), *Asiagomphus* (1 sp.), *Platygomphus* (1 sp.), *Megalogomphus* (2 sp.), *Perissogomphus* (1 sp.), Family AESHNIDAE : *Gynacantha* (11 sp.), *Anax* (5 sp.), *Aeshna* (1 sp.), *Anaciaeschna* (1 sp.), *Hemianax* (1 sp.), *Oligoaeschna* (2 sp.), *Periaeschna* (2 sp.), *Tetracanthagyna* (1 sp.), *Cephalaeschna* (3 sp.), *Petaliaeschna* (1 sp.), *Gynacanthaeschna* (1 sp.), *Polycanthagyna* (1 sp.), Family CORDULEGASTERIDAE : *Anotogaster* (3 sp.), *Chlorogomphus* (5 sp.), *Neallogaster* (2 sp.), *Cordulegaster* (1 sp.), Family CORDULIIDAE : *Epophthalmia* (3 sp.), *Macromia* (6 sp.), *Hemicordulia* (1 sp.), *Idionyx* (1). Family LIBELLULIDAE : *Aethriamanta* (1 sp.), *Urothemis* (1 sp.), *Macrodiplax* (1 sp.), *Amphithemis* (2 sp.), *Tetrathemis* (1 sp.), *Hylaeothemis* (1 sp.), *Lyriothemis* (3 sp.), *Lathrecista* (1 sp.), *Cratilla* (1 sp.), *Potamarcha* (1 sp.), *Orthetrum* (17 sp.), *Palpopleura* (1 sp.), *Brachydiplax* (3 sp.), *Acisoma* (1 sp.), *Diplacodes* (2 sp.), *Indothemis* (2 sp.), *Crocothemis* (2 sp.), *Brachythemis* (1 sp.), *Neurothemis* [4 sp. (3 sub. sp.)], *Sympetrum* (2 sp.), *Rhodothemis* (1 sp.), *Trithemis* (3 sp.), *Onychothemis* (1 sp.), *Zygonyx* (1 sp.), *Rhyothemis* (4 sp.), *Zyxomma*

(1 sp.), *Tholymis* (1 sp.), *Pantala* (1 sp.), *Tramea* (3 sp.), *Camacinia* (1 sp.), *Agrionoptera* (1 sp.), *Pseudotramea* (1 sp.). *Hydrobasileus* (1 sp), *Bradinopyga* (1 sp.).

Rare species : Lahiri (1989) has considered following species as rare, *Lestes nigriceps, Lestes praemorsa sikkima, Davidius aberrans senchalensis, Davidius davidi assamensis, Onychogomphus cacharicus. Paragomphus lindgreni, Gynacantha biharica, Gynacantha odoneli, Macromia flavovittata.* Govt. of India has declared *Epiophlebia laidlawi* as an endangered species.

Habitat types

Dragonflies of eastern India occupy following types of habitats :

(1) *Montane forms* : A few examples of species/subspecies which are so far known to occur only in the Himalayan and hilly regions, *viz., Drepanosticta carmaichaeli, D. polychromatica, Calicnemia mortoni, Calicnemia sudhaae, Ceriagrion coeruleum, Megalestes irma, M. lieftincki, Lestes praemorsa sikkima, Indolestes cyaneus, Bayadera longicauda, Epiophlebia laidlawi, Paragomphus lindgreni, Davidius aberrans senchalensis, Cephalaeschna orbifrons, Periaeschna unifasciata, Chlorogomphus fraseri, C. selysi, Macromia flavovittata.*

(2) *Nonmontane forest forms* : Species confined in the forests of plaina and in the foot hills. *Elattoneura campioni cacharensis, Prodasineura odoneli, Copera superplatypes, Coeliccia bimaculata, Mortonagrion aborense, Rhinocypha immaculata, R. vitrinella, Echo m. margarita, Phaeanendrogomphus aureus, Macrogomphus seductus, Gomphidia williamsoni, Burmagomphus hasimaricus, Merogomphus martini, Asiagomphus odoneli, Onychogomphus saundersi, Onychogomphus cacharicus, Megalogomphus flavicolor, Gynacantha odoneli, Macromia pallida.*

(3) *Eclectic forms* : Pinhey (1978) used the term while discussing the biogeography of Odonata of South Africa. These species occur in the open land, or sparse bush. This biotope of Odonata ranges from rivers thinly bordered with trees to streams and pools. The larger more or less open swamps containing patches of thick bush or wooded land may be considered. Species are *Macrogomphus montanus, Ictinogomphus atrox, I. angulosus, Gynacantha albystyla, G. biharica.*

(4) *Paraxerophilic forms* : Species confined to semi-arid zones. *Lestes* sp. *Gomphidia leonoraae.*

Urban forms : Species so far recorded from the urbanised area viz. *Ceriagrion* sp. *Gynacantha rammohani.*

Species with wide adaptations : Most of the species are widely distributed in the Old World. Some species like *Crocothemis servilia servilia, Macrodiplax cora, Pantala flavescens* have extended to New World even.

Intraspecific variations : In the course of the present study it appears that in general the Odonata of eastern India do not show any marked differences from the specimens from other regions of India. Some minor variations may be noted when compared with specimens of other parts of India but in any case these are not of taxonomic importance.

Campion (1917) reported the deviations in the antenodal variations in Fabricius' type of *Neurothemis tullia tullia* (=*Neurothemis equistris*) from the general taxonomic characters of the antenodals of the species. Similar observations were made by Raychaudhuri *et. al.* (1969) on *Brachythemis contaminata* and *Diplacodes trivialis* from Calcutta and Lahiri et. al. (1970) in *Crocothemis servilia servilia* of Nagaland. Prasad and Kumar (1981) recorded intraspecific variations of different morphological characters of *Trithemis festiva* and later Prasad and Ghosh (1984) reported similar observations of *Brachythemis contaminata.* But in no case importance of these variations in classification were reported.

Variations in colour of several morphological parts noted during the study may be cited as follows: (1) *Pseudagrion decorum* of Maharashtra are more olivaceous than those of eastern Indian forms; (2) male specimens of *Pseudagrion r. rubriceps* from Maharashtra have thinner black lines on the middorsum of thorax than those of Calcutta as well as eastern Indian forms (3) Female specimens of *Ceriagrion olivaceum* from Maharashtra has lighter thoracic color than those of eastern India forms (4) Thoracic colour of *Ceriagrion cerinorubellum* from Andaman Islands is brownish in contrast to green thoracic color of the eastern Indian forms (5) Specimens of *Ischnura senegalensis* from Rajasthan and Andaman Islands in ageneral agree with the specimens from eastern India; while one male example from Andaman Is. is longer than those of eastern Indian forms (6) The male specimens of *Ischnura aurora aurora* from Bihar, Orissa, and Madhya Pradesh bear azure blue mark on segments 8-10 in contrast to black marking in specimens from Assam, Manipur and West Bengal. (7) One male specimen of *Neurobasis chinensis chinensis* from Andhra Pradesh differs from the eastern Indian specimens due to greenish-white labium (8) The red color of the mesothoraxcic triangle of *Rhinocypha quadriamaculata* from Darjeeling, Shillong and Dehra Dun is brighter than those of specimens belonging to the plains of India (9) Male specimens of *Rhinocypha bisignata* from Andhra Pradesh differs from the specimens found in Orissa since the former lacks the post-ocellar and post ocular spots (10) One male specimen of *Ictinogomphus rapax* of Rajasthan varies from the specimens of eastern Indian localities since the former possesses bluish yellow labrum with distinct bifid occipital spine, and lateral sides of prothorax yellow; one male specimen from Nicobar Islands differs from specimens of West Bengal since the former possesses reddish brown labrum and face; the lateral yellow marking on thorax extends up to the first abdominal segment; yellow enfumation present only in the center of hindwing. (11) One female specimen of *Hemianax ephippiger* from Rajasthan differs from the female specimen of eastern India, since the former lacks reddish brown color in the region between MA and IA.

Intraspecific variations in length of abdomen and hindwing of dragonflies of different areas have also been observed. Similar observations were made by Kiauta and Kiauta (1990) in *Sympetrum pallipes* of British columbia.

Altitudinal variations has been described by Lieftinck (1949) in Odonata of New Guinea. Variations due to altitude has been observed only in *Rhinocypha quadrimaculata.*

The factors responsible for morphological variations are not yet known and hence it is difficult to formulate any ecological hypothesis for Odonata distributed in eastern India. A similar conclusion was drawn by Mayr (1963) in case of invertebrates.

Distribution pattern

(A) *Confined to eastern India*: *Elattoneura campioni cacharensis, Calicnemia sudhaae, Coeliccia prakritiae, Coeliccia schmidti, Coeliccia rossi, Megalestes irma, Megalestes lieftincki, Lestes praemorsa sikkima, Lestes nigriceps, Burmargiolestes laidlawi, Rhinocypha trimaculata, Rhinocypha vitrinella, Ictinogomphus atrox, Gomphidia leonoraae, Davidius davidi assamensis, Davidius aberrans senchalensis, Asiagomphus odoneli, Paragomphus echinoccipitalis, Onychogomphus cacharicus, Megalogomphus flavicolor, Gynacantha odoneli, Gynacantha albistyla, Gynacantha biharica, Gynacantha bainbriggei, Gynacantha rammohani, Gynacantha arnaudi, Oligoaeschna speciosa, Chlorogomphus fraseri, Macromia flavovittata* etc.

(B) *Indeterminate species*: Followings have been considered as species confined in eastern India since these do not agree with any known species, *Lestes* sp., *Ceriagrion* sp., *Onychargia* sp., *Orthetrum* sp.

(C) *Extended to other parts of India* : *Drepanosticta carmaichaeli, Disparoneura quadrimaculata, Caconeura gomphoides, Pseudagrion malabaricum, Pseudagrion hypermelas, Cercion calamorum dyeri, Rhodischnura nursei, Agriocnemis pieris, Agriocnemis splendidissima, Lestes thoracicus, Philoganga montana, Rhinocypha immaculata, Rhinocypha bisignata, Anisopleura lestoides, Echo margarita margarita, Phaenandrogomphus aureus, Gomphidia t-nigram, Cyclogomphus heterostylus, Anisogomphus occipitalis, Burmagomphus p. pyramidalis, Burmagomphus sivalikensis, Merogomphus martini, Platygomphus dolabratus, Onychogomphus grammicus, Onychogomphus schmidti, Onychocomphus risi, Onychogomphus striatus, Petaliaeschna fletcheri, Gynacanthaeschna sikkima, Aeshna p. petalura, Polycanthagyna erythromelas, Cordulegaster brevistigma brevistigma, Chlorogomphus atkinsoni, Macromia flavocolorata, Macromia flavicincta, Lyriothemis bivittata, Sympetrum orientale, Onychothemis testacea ceylanica* etc.

(D) *Extended to other parts of the Oriental Region* :

Protosticta himalaica, Drepanosticta polychromatica, Prodasineura odoneli, Elattoneura campioni campioni, Calicnemia miniata, Calicnemia pulverulans, Calicnemia miles, Coeliccia renifera, Copera superplatypes, Copera marginipes, Copera vittata serapica, Copera vittata assamensis, Copera ciliata, Pseudagrion decorum, Pseudagrion rubriceps rubriceps, Pseudagrion spencei, Ceriagrion olivaceum. Ceriagrion cerinorubellum, Ceriagrion azureum, Aciagrion occidentale, Aciagrion azureum, Aciagrion olympicum, Aciagrion hisopa hisopa, Aciagrion approximans, Aciagrion pallidum, Ischnura rufostigma annandalei, Ischnura rufostigma mildredae, Cercion malayanum, Enallagma parvum, Agriocnemis clauseni, Agriocnemis nana, Agriocnemis dabreui, Mortonagrion aborense, Onychargia atrocyana, Megalestes Major, Lestes elatus, Lestes viridulus, Lestes umbrinus, Indolestes cyaneus, Rhinocypha bifasciata, Rhinocypha spuria, Rhinocypha quadrimaculata, Rhinocypha unimaculata, Bayadera longicauda, Bayadera indica, Anisopleura comes, Euphaea ochracea ochracea, Euphaea guerini masoni, Schmidtiphaea schmidi, Vestalis apicalis apicalis , Matrona basilaris nigripectus, Epiophlebia laidlawi, Onychogomphus biforceps, Onychogomphus schmiditi, Nihonogomphus pulcherrimus, Perissogomphus stevensi, Paragomphus lineatus, Paragomphus lindgreni, Macrogomphus montanus, Macrogomphus seductus, Megalogomphus smithi, Gomphidia, williamsoni, Burmagomphus hasimaricus, Cephalaeschna masoni, Cephalaeschna acutifrons, Cephalaeschna orbifrons, Periaeschna magdalena, Periaeschna unifasciata, Oligoaeschna martini, Anax nigrofasciatus nigrolineatus, Gynacantha dravida, Gynacantha khasiaca, Chlorogomphus preciosus preciosus, Chlorogomphus selysi, Chlorogomphus mortoni, Neallogaster latifrons, Neallogaster hermione, Macromia moorei, Macromia cingulata, Macromia pallida, Idionyx optata, Epophthalmia frontalis frontalis, Epophthalmia vittigera bellicosa, Aethriamanta brevipennis brevipennis, Tetrathemis platyptera, Hylaeothemis fruhstorferi apicalis, Amphithemis vacillans, Amphithemis curvistyla, Agrionoptera insignis, Brachydiplax farinosa, Brachydiplax sobrina, Brachythemis contaminata, Bradinopyga geminata, Neurothemis fulvia, Neurothemis fluctuans, Neurothemis intermedia intermedia, Neurothemis Intermedia atalanta, Indothemis limbata Indothemis carnatica, Sympetrum hypomelas, Zygonyx iris iris, Rhyothemis obsolescens, Rhyothemis variegata variegata, Rhyothemis plutonis, Pseudotramea prateri, Camacinia gigantea.

(E) *Extended to other parts of the old world* :

Pseudagrion microcephalum, Pseudagrion australasiae, Ceriagrion coromandelianum, Ceriagrion fallx cerinomelas, Ischnura elegans, Ischnura senegalensis, Ischnura forcipata, Ischnura aurora aurora, Ischnura rufostigma rufostigma, Agriocnemis lacteola, Agriocnemis pygmaea pygmaea, Agriocnemis fenina femina, Argiocnemis rubescens rubeola, Lestes nodalis, Platylestes platystylus, Libellago lineata lineata,

Rhinocypha cuneata, Rhinocypha fenestrella, Rhinocypha trifasciata, Rhinocypha trimaculata, Caliphaea confusa, Neurobasis chinensis chinensis, Vestalis gracilis gracilis, Vestalis smaragdina, Matrona basilaris basilaris, Anoromogomphus heteropterus, Macrogomphus robustus, Ictinogomphus rapax, Onychogomphus duaricus, Stylogomphus inglisi, Aeshna ornithocephala, Anaciaeschna jaspedia, Anax imperator, Anax guttatus, Anax parthenope, Hemianax ephippiger, Gynacantha bayadera, Gynacantha basiguttata, Gynacantha subinterrupta, Epopthalmia vittata vittata, Hemicordulia asiatica, Urothemis signata signata, Lyriothemis cleis, Lyriothemis aciagastra, Lathrecista asiatica asiatica, Cratilla lineata, Orthetrum brunneum, Orthetrum anceps, Orthetrum taeniolatum, Orthetrum luzonicum, Orthetrum sabina sabina, Orthetrum japonicum internum, Orthetrum testaceum testaceum, Orthetrum glaucum, Ortetrum pruinosum neglectum, Orthetrum cancellatum cancellatum, Potamarcha congener, Palpopleura sexmaculata sexmaculata, Brachydiplax chalybea chalybea, Nannophya pygmaea, Acisoma panorpoides panorpoides, Diplacodes trivialis, Diplacodes nebulosa, Neurothemis tullia tullia, Rhodothemis rufa, Trithemis aurora, Trithemis festiva, Trithemis pallidinervis, Zyxomma petiolatum, Tholymis tillarga, Tramea virginia, Tramea basilaris burmeisteri etc.

(F) *Species extended to New World*

Macrodiplax cora, Pantala flavescens, Crocothemis servilia servilia, Thdymis tillarga.

CONTINUOUSLY DISTRIBUTED SPECIES

(1) *From Peninsular India to Australia via Gangetic plains and Assam region* :

Pseudagrion microcephalum, Ceriagrion coromandelianum, Ischnura aurora aurora, Agriocnemis pygmaea pygmaea, Orthetrum pruinosum neglectum, Potamarcha congener, Acisoma panorpoides panorpoides, Diplacodes nebulosa, Trithemis aurora etc.

(ii) *From Peninsular India to Malaysia via Gangetic plains* :

Neurobasis chinensis chinensis, Urothemis signata signata, Lathrecista asiatica asiatica, Orthetrum luzonicum, Palpopleura sexmaculata sexmaculata, Brachythemis contaminata, Neurothemis fulvia, Trithemis pallidinervis, Rhyothemis variegata variegata, Tramea virginia, etc.

(iii) *From Peninsular India to Indo-China via Gangetic plains* :

Pseudagrion rubriceps rubriceps, Ceriagrion olivaceum, Aciagrion pallidum, Enallagma parvum, Ictinogomphus rapax, Aethriamanta brevipennis, Orthetrum triangulare triangulare, Brachydiplax sobrina, Bradinopyga geminata, Zyxomma petiolatum etc.

(iv) *From the Gangetic plains to Australia via the Assam region* :

Pseudagrion australasie, Agriocnemis femina femina, Gynacantha bayadera etc.

(v) *From the Gangetic plains to Malayasia via the Assam region* :

Epophthalmia vittigera bellicosa, Brachydiplax cyalybea chalybea, Brachydioalx farinosa, Rhyothemis plutonia etc.

(vi) *From the Gangetic plains to Indo-China via the Assam region* :

Ischnura rufostigma rufostigma, Rhinocypha cuneata, Matrona basilaris basilaris, Onychogomphus saundersi, Periaeschna magdalena, Gynacantha khasiaca, Amphithemis vacillans, Lyriothemis acigastra etc.

(vii) *From the Assam region to Australia* : *Lyriothemis cleis.*

(viii) *From the Assam region to Indo-China* :

Agriocnemis clauseni, Amphithemis curvistyla, Vestalis smaragdina, Matrona basilaris nigripectus etc.

SPECIES WITH A SPARSE DISTRIBUTION IN INDIA

Name of species	*Areas of distribution*
Caconeura gomphoides	E. India, S. India
Calicnemia pulverulans	W. & E. Himalaya
Copera vittata serapica	S.W. & West coast of India, N.E. India
Pseudagrion malabaricum	S.W. India & Calcutta
Pseudagrion spencei	N. India, N.E. India & Lower Bengal
Ceriagrion cerinorubellum	S.W. India, N.E. India, Bihar, Orissa
Aciagrion occidentale	S.W. India, Orissa
Aciagrion hisopa hisopa	S.W. India, E. Himalaya, Western part of W. Bengal
Ischnura elegans	N.W. India, Calcutta
Ischnura forcipata	Baluchistan, W. Himalaya, Bengal, Orissa
Ischnura rufostigma annandalei	N.W. India, N.E. India
Ischnura rufostigma mildredae	Nepal, Manipur
Rhodischnura nursei	W. Himalaya, S.W. India, N.E. Coast of India
Cercion malayanum	N.W. India, Central India, N.E. India, Calcutta
Agriocnemis pieris	S.W. India, Calcutta,
Agriocnemis nana	Calcutta, Myanmar, Singapore, Thailand, Malayasia
Agriocnemis splendidissima	S.W. India, N.E. India
Agriocnemis dabreui	Central India, N.E. India
Onychargia atrocyana	S.W. India, N.E. India
Lestes praemorsa praemorsa	S.W. India, E. Himalaya, N.E. India
Lestes elatus	S.W. India, Orissa
Lestes nodalis	Orissa, N.E. India
Lestes platystylus	Calcutta, N.E. India
Libellago lineata lineata	W. Himalaya, N.E. India
Anisopleura lestoides	W. Himalaya, N.E. India
Euphaea cardinalis	S.W. India, N.E. India
Anormogomphus heteropterus	Pakistan, W. Himalaya, Bihar
Nihonogomphus pulcherrimus	Bihar, Burma (Myanmar)
Ictinogomphus pertinax	N.E. India, Lower Bengal, Bihar
Gomphidia t-nigrum	S.W. India, N.E. India
Cyclogomphus heterostylus	W. India, Deccan, S.E. India, E. Himalaya

N.B. E = Eastern; S = South; W = West; N = North.

Name of species	*Areas of distribution*
Burmagomphus pyramidalis	S.W. India, N.E. India
Burmagomphus sivalikensis	W. Himalaya, N.E. India
Onychogomphus M-flavum	W. Himalaya, N.E. India
Onychogomphus modestus	W. Himalaya, N.E. India
Onychogomphus duaricus	W. Himalaya, Duars of Bengal
Onychogomphus schmidti	W. Himalaya, N.E. India
Onychogomphus risi	W. Himalaya, Duars of Bengal
Onychogomphus striatus	S.W. India, E. Himalaya
Tetracanthagyna waterhousei	Duars of Bengal
Gynacanthaeschna sikkima	North India, N.E. India
Aeshna ornithocephala	W. Himalaya, E. Himalaya, Assam.
Anaciaeschna jaspedia	S.W. India, North Bengal, S. Bengal
Anax imperator imperator	N.W. India, S. Bengal
Anax parthenope parthenope	S.W. India, N.E. India
Gynacantha subinterrupta	E. Himalaya
Polycanthagyna erythromelas	W. Himalaya, E. Himalaya
Cordulegaster brevistigma brevistigma	W. Himalaya, E. Himalaya
Macromia flavocincta	S.W. India, E. Himalaya, S.E. Coast
Macromia cingulata	S.W. India, Bengal
Epophthalmia vittata vittata	W. Himalaya, S.W. India, S.E. Coast, S. Bengal, Bihar
Epophthalmia frontalis frontalis	S.W. India, E. coast
Epophthalmia vittigera bellicosa	S. Bengal, N.E. India.
Hemicordulia asiatica	S.W. India, N.E. India, Africa
Tetrathemis platyptera	S.W. India, Bengal, N.E. India
Hylaeothemis frustorferi apicalis	S.W. India, Orissa
Cratilla lineata	W. Himalaya, S.W. India, Duars of Bengal E. Himalaya, Orissa
Orthetrum brunneum	W. India, Bihar, N.E. India
Orthetrum glaucum	S.W. India, N.E. India
Orthetrum cancellatum cancellatum	W. Himalaya, Central India, N.E. India
Palpopleura sexmaculata sexmaculata	S.W. India, N. India, N.E. India
Nannophya pygmaea	N.W. India, N.E. India
Zygonyx iris iris	S.W. India, N.E. India
Onychothemis testacea ceylanica	S. W. India, Duars of Bengal

The present picture of distribution is probably the result of several factors. The important cause may be the upliftment of the Himalayas in the Tertiary period, when the environment of India changed. The second factor may be due to human activities and in consequence parts of the Gangetic Plains and most of the peninsula turned barren. But South-West India (Western Ghats) and the North-East India however still retain luxuriant vegetation which is conducive for most of the species.

Remark on endemism : According to Emerson (1955) "Endemic genera are found only in a single major zoogeographical region" In the present investigation endemism has been considered in terms of eastern India (5,06,174 sq.km.) only. This is large enough for justification of a restricted approach. In the area, 2 genera and 34 species and subspecies are endemic.

Note on speciation : The area supports 33 endemic species and subspecies including sp. indet, those are presumed to have evolved locally (sensu Roonwal & Verma 1977). Furthermore, North-East India (E. Himalaya, the Duars of North Bengal and Assam region) shows the highest concentration of endemic species and subspecies. Since the north-eastern India supports dense vegetation and is sequested into several pockets by hills, fastflowing streams and rivers despite having low migration pressure. Moreover, dragonflies which reached the area from different geographical regions met ecological diversification. In consequence competition became less and the population was divided into small groups of different sizes. Hence population effects were called into play, causing enhancement of the intensity of variation and speciation as well (sensu Roonwal and Chhotani 1965).

Note on the relationship of the fauna : The Indian fauna of Odonata is derived from Malayasia and to a lesser extent from the Palaearctic; but it is rich in endemic forms the origin of some of them is obscure. A few Ethiopean and Australian forms may have made their way to India (Fraser 1933c).

(a) *Faunal peculiarities* : It has been observed that the higher families *viz.* Coenagrionidae among Zygoptera and Libellulidae among Anisoptera contribute most of the faunal composition. Relict families like Amphipterygidae, Megapodagrionidae, Synlestidae, and primitive family like Platystictidae are also present.

Following table summarizes the approximate number of eastern Indian genera and species peculiat to the area and common to other regions. Table II summarizes peculiarities of the fauna of Assam region, Eastern Himalaya and the Gangetic plains.

Table I. Approximate number of eastern Indian genera, Species and subspecies peculiar to the area and common to other regions of India and the World.

Faunal peculiarities	Genera	Species/subspecies
Total number	112	294
Endemic to the Oriental (including Indian fauna)	15	214 (79.77%)
Endemic to Indian subregion (including Eastern India)	3	70 (25.84%)
Endemic to eastern India (Only the states under consideration	2	34 (12.4%)

Faunal peculiarities	Genera	Species/subspecies
Common to Peninsular India (below 17°N. Lat.)	79	64 (23.9%)
Common to Indo-China	87	127 (47.5%)
Common to Malayasia	66	58 (20.5%)
Common to China	47	64 (23.9%)
Common to Palaearctic (excluding China)	39	30 (11.2%)
Common to Australia	42	27 (10.1%)
Common to Africa	33	9 (3.4%)
Common to Madagascar	9	5 (1.8%)
Common to Seychelles	12	7 (2.6%)

Table indicates a high percentage of endemism in the study area at the species level and a high percentage of species is common to Indo-malaya. Indeed there is alittle relationship with the African fauna at the species level, and this probably due to vast span of desert between India and Africa. Similarly lack of close relationship with the fauna of Madagascar and Seychelles suggest that there may be multiple causes for the present condition of relationship. On the other hand, China shares a high percentage of such fauna. It is believed that the present relationship has been established by the faunal exchange with other regions after the formation of the Himalayas during the Tertiary period when the Indian Peninsula came in direct contact with the mainland Asia. The exchange took place primarily through the eastern border, line, the Assam-Burma border, and secondarily through the western border.

The paths of faunal exchange

(1) *Eastern border line*: Mani (1974b) stresses its importance in the faunal exchange. In case of Odonata the area is transitional and represents a gate of faunal exchange as well as an important center of differentiation and radiation. Leftinck (1984) opined that *Calicnemia* group radiated from the Himalayas. The area appears to be important meeting point of the humid tropical tertiary mountain faunas and Gondwana fauna. Through this gate almost uninterrupted interchange have taken place between different parts of eastern India as well as the Indian peninsula and Asia. The exchange mainly involved transgression of the Indo-chinese and malayan fauna into India. This has been along two lines—primarily westwards along the Himalayas and southwards to peninsula. The Asiatic fauna has spread in the direction of the west both to the North and South of the eastern end of the Himalayas. In North of Himalayas, these faunas have transgressed not only in the eastern Tibet but also into the mountain ranges of the Himalayas in the confluence with the Indian side. Indo-Chinese and Malayan forms extend further west and are indeed represented by aseries of local endemics along the Himalayas. Kiauta (1984) opined that chlorocyphids reached India from South East Asia.

Western border lines: The ecological and biogeographical transitional area lying between the plains of river Indus and the Iranian-Afghanistan border constitutes the western border lands of India. The

characteristic fauna in the area is composed largely of mediterranean elements with a considerable admixture of Turkmenian and some Ethiopean deriavatives of the dragonfly fauna available in eastern India. The western border of India contributes a little. An influx through the western gate had occurred in eastern India probably after the Pleistocene since this region came in contact with the peninsula much later (Mani 1974d); in the west the transgression fauna to the Indo-Gangetic plains has taken place *via* the peninsula. Species distributed in eastern India have probably invaded the country in this way are *Ischnura elegans elegans, Anax imperator imperator, Hemianax ephippiger, Orthetrum cancellatum cancellatum, Orthetrum acceps, Orthetrum brunneum* etc.

Regional biogeography

Table II. Regional peculiarities

(1) *Assam region* (Assam valley & Purvanchal*)	
Total no. of species recorded	171
Endemic to Assam region	21
Common to Indo-malayan	153
Common to eastern Himalaya	69
Common to Tibet	15
Common to Nepal	43
Common to China	52
Common to Ganga Plain	86
Common to peninsula	68
(2) *Eastern Himalaya*	
Total no. of species	118
Endemic to Himalaya	23
Endemic to E. Himalaya	16
Common to Nepal	51
Common to W. Himalaya	49
Common to Ganga Plain	42
Common to Assam region	69
Common to Tibet	10
Common to Indo-Malaya	45
Common to Peninsula	38
(3) *Ganga Plain* :	
Total No. of species recorded	174
Endemic to Ganga plain	16
Common to Assam region	86
Common to Eastern Himalaya	42
Common to Peninsula	80
Common to Indo-malaya	138
Common to Nepal	32

* Since Purvanchal was once a part of Assam, earlier workers used to equate Assam with Purvanchal. In consequence it is not possible to isolate the Purvanchal fauna.

Note on the peculiarities of the fauna of different regions

(i) *Assam region*

From the data available it may be presumed that the fauna of this region is dominated by Indo-malayan elements as conjectured by Fraser (1933c). Moreover, its relationship with the fauna of other regions and the high percentage of endemism indicate its importance as a centre of differentiation, radiation and a path of faunal exchange. Although Purvanchal is tectonically associated with the Himalayas, its fauna (some of which can be separated from those of Assam valley) is not close to that of the Himalayas. The whole of Assam region is the seat of the dense vegetation and cut into several pockets by hills, rivers and fast flowing streams. As a result several species could not cross the barriers thus created. Furthermore, due to low migration pressure isolation set in and the speciation speeded up following population effects. Similar contentions was advocated by Roonwal and Chhotani (1965) on termites.

(ii) *Eastern Himalaya*

The Himalayas have important influence on the climate of India. Except for parts in the far east the Himalayas are almost beyond the general influence of the monsoon (1974c). The fauna is composed largely of tropical elements derived from the fauna of the Indo-malyan subregion of the Oriental region. It is presumed that after the elevation of the Himalayas, Odonata from different parts of Oriental region reached the mountains and

constitute the present fauna. Among the migratory species, only *Pantala flavescens* was able to reach 3900m (=13000 ft.). Hence it is reasonable to content that both hills and forests of the Himalayas play a great role in the formation of barriers as well as in speciation.

(iii) *Ganga Plain*

This is a part of the Indo-Gangetic Plain and is dominated by the influence of the Himalayas in the North. The pressure of human population has resulted rapid devegetation since classical times (Mani 1974e). Due to the existence of comparatively young Himalayas in the North, older peninsula in the South and direct communication with the Assam region in the East, the fauna of the plain is being influenced by number of factors. This account for the highly diversified faunas of the Himalayas and of the East as well as the relicts of the peninsula. Among the endemics, it supports eight which occur in the dense vegetation of the duars of North Bengal. This indicates that the vegetation plays an important role in the life of Odonata. Similar observation was made by Lahiri (1987) on his studies on the Odonata of Meghalaya, a small state in the Assam region. The author (Lahiri) asserted that the deforestation of the central Jaintia hills is the cause for depletion in the number of species.

Conclusion on faunal relationship

In short it may be inferred that the dragonflies of eastern India bear more affinities with the Indo-China than with any other part of the world. But the fauna of Assam region, Gangetic plain and Eastern Himalaya are closer to Indo-malayan forms than those of Indian peninsula.

SUMMARY

The area covering the states of Arunachal Pradesh, Assam, Bihar, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal (*ca* 5,06,174m^2) supports 294 species and subspecies distributed over 112 genera, 17 families and 3 suborders.

According to number of species and subspecies families may be arranged as under.

Libellulidae (63), Coenagrionidae (43), Gomphidae (37), Aeshnidae (28), Platycnemididae (18), Chlorocyphidae (13), Lestidae (13), Cordulegasteridae (11), Corduliidae (10), Euphaeidae (9), Calopterygidae (8), Protoneuridae (5), Synlestidae (3), Platystictidae (3), Megapodagrionidae (1 sp.) and Epiophlebidae (1).

In the above principle genera may be listed as follows. *Rhinocypha* (12), *Orthetrum* (12), *Lestes* (11), *Gynacantha* (11), *Agriocnemis* (8), *Pseudagrion* (7), *Ceriagrion* (7), *Coeliccia* (9), *Ischnura* (7), *Onychogomphus* (7), *Calicnemia* (6), *Aciagrion* (7), *Macromia* (6), *Copera* (5), *Chlorogomphus* (5), *Neurothemis* (5), *Ictinogomphus* (4), *Anax* (4), *Vestalis* (3), *Anisopleura* (3), *Euphaea* (3), *Megalestes* (3), *Paragomphus* (3), *Gomphidia* (3), *Cephalaeschna* (3), *Anotogaster* (3), *Epophthalmia* (3), *Lyriothemis* (3), *Brachydiplax* (3), *Trithemis* (3), *Rhyothemis* (3), *Tramea* (3), *Matrona* (2), *Bayadera* (2), *Elattoneura* (2), *Cercion* (2), *Onychargia* (2), *Macrogomphus* (2), *Davidius* (2), *Anisogomphus* (2), *Periaeschna* (2), *Neallogaster* (2) *Amphithemis* (2), *Diplacodes* (2), *Crocothemis* (2), *Sympetrum* (2). Each of the followings contributes one species. *Neurobasis, Echo, Caliphaea, Schmidtiphaea, Philoganga, Libellago, Indolestes, Burmargiolestes, Protosticta, Disparoneura, Caconeura, Prodasineura, Himalagrion, Rhodischnura, Enallagma, Mortonagrion, Argiocnemis, Epiophlebia, Nihonogomphus, Phaenandrogomphus, Stylogomphus, Anormogomphus, Cyclogomphus, Merogomphus, Asiagomphus, Platygomphus, Aeshna, Anaciaeschna, Hemianax, Oligoaeschna, Tetracanthagyna, Petaliaeschna, Gynacanthaeschna, Polycanthagyna, Cordulegaster, Hemicordulia, Aethriamanta, Urothemis, Macrodiplax, Tetrathemis, Hylaeothemis,*

Lathrecista, Cratilla, Potamarcha, Palpopleura, Acisoma, Brachythemis, Rhodothemis, Onychothemis, Zygonyx, Zyxomma, Tholymis, Pantala, Camacinia, Pseudotramea and Agrionoptera.

The monograph contains key for identification of the species examined, their variations from the reference collections present in Zoological Survey of India and descriptions available in the Fauna of British India volumes, geographical distribution in detail of each species and subspecies recorded from the area. It also embodies description of new species of *Calicnemia* and Gomphidia and five indeterminate species, females of *Agriocnemis nana, Indothemis limbata limbata.*

The study reveals that Odonata of eastern India do not, in general, display marked variations from that of other parts of India. Indeed some variations may be noted but are not much taxonomic importance. Regional variations are random that no ecological rule could be considered.

Analysis of the geographical distribution of taxa reveals that two genera and thirty three species and subspecies are endemic to the eastern India. Others occur in the old world. Three species also occur in the New World. About sixty four species and subspecies occur in China, one hundred twentyseven species and subspecies in Indo-china, fiftyseven occur in Malayasia, thirty in Paleartic region (excluding China), twentyseven in Australia; nine in Africa, seven in Seychelles, and five in Madagascar.

Among the species and subspecies which occur in other parts of the world seventy of them are sparsely distributed in India, while others are continuously distributed in the following ways. *Pseudagrion microcephalum, Ceriagrion coromandelianum, Ischnura aurora aurora, Agriocnemis pygmaea pygmaea, Orthetrum pruinosum neglectum* etc. are distributed from the peninsular India to Australia via the Gangetic plain and Assam area; *Neurobasis chinensis chinensis, Urothemis signata signata, Lathrecista asiatica asiatica, Orthetrum luzonicum, Palpopleura sexmaculata sexmaculata, Brachythemis contaminata Neurothemis fulvia,* from the peninsular India to Malayasia *viz* the Gangetic alluvium and the Assam area; *Pseudagrion rubriceps rubriceps, Ceriagrion olivaceum, Aciagrion pallidum, Enallagma parvum, Ictinogomphus rapax, Aethriamanta brevipennis, Orthetrum triangulare triangulare Brachydiplax sobrina* etc. occur from the penninsular India to the Indo-chinese subregion. Similarly *Pseudagrion australasiae, Agriocnemis femina femina, Gynacantha bayadera* etc., occur from the Gangetic plains to Australia via the Assam area; *Epopthalmia vittigera, Brachydiplax chalybea, Brachydiplax farinosa, Rhyothemis plutonia* etc., are distributed from the Gangetic plains to Malayasia via the Assam area; *Ischnura rufostigma rufostigma, Rhyothemis cuneata, Matrona basilaris basilaris, Onychogomphus saundersi Periaeschna magdalena, Gynacantha khasiaca, Tetrathemis yerburi, Amphithemis vacillans,* etc., occur from the Gangetic plains to *Indochina; Lyriothemis cleis* occurs from the Assam area to Australia, *Ceriagrion praetermissum* occur from the Assam region to Malayasia, *Agriocnemis clauseni, Amphithemis curvistyla, Vestalis smaragdina* etc. occur from Assam area to the Indo-Chinese subregion.

It is reasonable to think that the present relationship of the fauna has been established through the faunal exchange after the formation of the Himalayas. Very likely this trans-exchange took place primarily through the eastern border line (Assam-Burma frontier).

Zoogeographically Odonata of eastern India bears more affinities with the fauna of Indo-chinese subregion than with any other part of the world. Further more, the fauna of Assam region, Gangetic plain and the fauna of the eastern Himalaya are closer to the Indo-malayan forms than those of the Indian

peninsula. Moreover, the NE India (North Bengal, the Assam area and the eastern Himalaya) is rich in endemic fauna. It is presumed that the topography and dense vegetation help in breaking the population into small populations and reduce the migration pressure. And in consequence population effects are called into play speciation boosted up.

According to the distribution in ecological zones the fauna can be classified into Montane forms, Non montane forest forms, Eclectic forms, Paraxerophilic forms, Urban forms and species with wide adaptations.

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INDEX OF SCIENTIFIC NAMES