

OCCASIONAL PAPER NO. 110

Records of the Zoological Survey of India

THE ODONATA OF BIHAR, INDIA

M. Prasad
R. K. Varshney

Zoological Survey of India

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THE ODONATA OF BIHAR, INDIA

By

M. PRASAD and R. K. VARSHNEY

*Zoological Survey of India,
Calcutta*



Edited by the Director, Zoological Survey of India

1988

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Published : November, 1988

PRICE : Inland : Rs. 40.00
Foreign : £ 4.00 or \$ 6.00

PRINTED IN INDIA AT SRI AUROBINDO PRESS, 16, HEMENDRA SEN STREET,
CALCUTTA-700 006, AND PUBLISHED BY THE DIRECTOR AND
PRODUCED BY THE PUBLICATION DIVISION, ZOOLOGICAL
SURVEY OF INDIA, CALCUTTA-700 020

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Occasional Paper

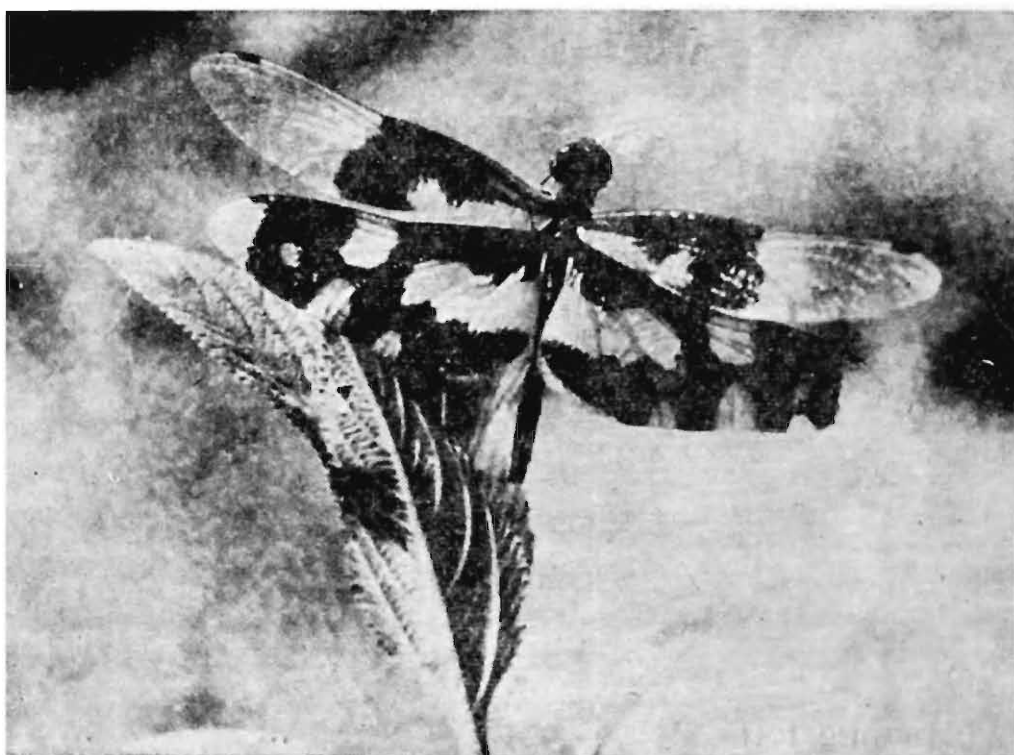
No. 110

1988

Pages 1—47

CONTENTS

	PAGE
INTRODUCTION	1
GEOGRAPHIC FEATURES AND CLIMATE	1
COLLECTION LOCALITIES	2
SYSTEMATIC ACCOUNT	3
KEY TO SPECIES AND SUBSPECIES IN BIHAR	31
ZOOGEOGRAPHY	40
SUMMARY	44
ACKNOWLEDGEMENTS	44
REFERENCES	44
MAP OF BIHAR	47
PLATES	



Rhyothemis variegata variegata (L.)

INTRODUCTION

The state of Bihar is situated in the eastern part of India. It has a varied topography viz., himalayan foot-hills, gangetic plains and the plateau of Chhota Nagpur. The ecological niches provide excellent habitats including hill streams as well as permanent and temporary water-bodies, for the breeding of Odonata. Therefore, a fairly large number of species can be seen at these breeding habitats, particularly during pre- and post-monsoon periods.

After the publication of the *Fauna of British India, Odonata*, in 3 volumes by FRASER (1933, 1934 and 1936), no comprehensive work dealing with the Odonata fauna of Bihar is available. BHASIN (1953), after a gap of 17 years, has listed 18 species from the state. In 1959 MEHROTRA described two species from Ranchi, under the genus *Orthetrum* Newman. Variations in the wing markings of some examples of *Rhyothemis variegata variegata* (Linn.) collected from Patna, were reported by VARSHNEY & GUHA (1972). Recently PRASAD & KUMAR (1977) and KUMAR & PRASAD (1981), while working on the materials from Dhanbad, have described 23 species of Odonata from there. PRASAD *et al.* (in press) have reported 3 species of the genus *Pseudagrion* Selys from Chhota Nagpur plateau. Consequent to all these works, a total of 45 species of Odonata are known from the Bihar state so far.

The authors have studied the Odonata materials present in the collections of the Gangetic Plains Regional Station, Zoological Survey of India, Patna. This study reveals that altogether 63 species (26 Zygoptera and 37 Anisoptera) under 36 genera and 7 families are found in the Bihar state. Out of these, 13 species are reported for the first time from certain localities, as enumerated in the text.

GEOGRAPHIC FEATURES AND CLIMATE

(See Map)

Bihar covers an area of approximately 174,000 sq. km. in the eastern part of India. The state is situated between 22°00'—27°30'N latitude and 83°20'—88°17'E longitude. It is bounded in north by Nepal, in east by West Bengal, in south by Orissa, in north-west by Uttar Pradesh and in south-west by Madhya Pradesh. The state has got varied topography comprising Himalayan foot-hills in the north, riverine plains in the middle, and Chhota Nagpur plateau in the south

which is rocky and hilly. Climatically northern Bihar is temperate, while the southern is hotter. Annual rainfall ranges between 100 to 150 cm.

Geologically Bihar is the most rich state in India. It produces about 40% of the total mineral products of the country. As regards the animal products, it leads in the production of lac and tussar silk. In agricultural crops it is second only to Uttar Pradesh for the sugar, and to West Bengal for the rice. Being situated in the centre of gangetic plains, many other agri- and horti-cultural crops are grown in plenty.

The river Ganga divides the plains horizontally into two parts, i.e., plain of north Bihar and the plain of south Bihar. The northern plain is traversed by a number of rivers including Ghaghra, Gandak, Burhi Gandak, Bagmati and Kosi etc. Rivers Karmanasha, Sone, Punpun, Falgu, Morhar, Pamar, Sakari, Kiul, Chir etc., are in the southern plain. The whole area is part of the Indo-Gangetic plains, which is one of the most fertile land stretch in the world. The northern boundary of the state has a small tract of terai.

The Chhota Nagpur plateau is one of the most minerally rich and forested parts of the Indian subcontinent. The plateau is enriched with hills, forest tracts and water falls. To complete the scenery of Chhota Nagpur, the aboriginals or tribals namely the munda, oraon, ho, santhal, etc., who predominate the region, are laborious, cheerful, and wonderfully clean and simple people, who excel in sports, hunting and trekking etc. The life and customs of the aboriginals of this plateau provide great attraction to the students of anthropology. The wildlife of Chhota Nagpur is also extremely inviting. The Betla National Park in Distt. Palamau and the Hazaribagh National Park in Distt. Hazaribagh are main attractions. Palamau has the distinction of being the forest where the world's first tiger census was enumerated in 1932, as well as it has the highest place in the plateau at Netarhat.

COLLECTION LOCALITIES

Following is the list of various localities arranged district-wise alphabetically, from where the Odonata materials have been studied in the present paper :

1. BHOJPUR (ARRAH) : Bahadurganj, Bherasri (Rampur), Englishpur, Gajraj Ganj, Harinagar, Jamira, Kulharia, Manjhaun, Piro, Shritola, Sinhaghat and Sone Barsa.

2. CHAPRA (SARAN) : Madhopur.
3. DARBHANGA : Bahadurpur, Bahari, Chikni, Darbara, Hayaghat, Kharsa, Khirma, Manigachhi, Misrauli (Simri), Paktola, Sakri, Singwara and Thathopur.
4. DHANBAD : Sindri, Tetulmari and Topchanchi.
5. GIRIDIH : Isribazar and Madhuban.
6. HAZARIBAGH : Hazaribagh, Hazaribagh lake, Hazaribagh National Park and Ramgarh.
7. MUZAFFARPUR : Baruraj, Baikatpur, Chhapra, Garha, Karja, Laluchhapra, Madhol, Paru, Rupan patti, Sahibganj and Saraya.
8. NALANDA : Rajgir and Asthawa.
9. PALAMAU : Agricultural farm Netarhat, Binda, Kechki, Lower Ghagri (Netarhat) and Upper Ghagri (Netarhat).
10. PATNA : Agricultural farm, Mithapur, Baikathpur, Bandar Bageecha, Begampur, Bhagwanpur near Khagaul, Bihta, Bulandibagh, Chhatarpur, Chiriyatar (Postal Park), Danapur, Daniawa near Fatuha, Digha, Harding Park, Jogipur, Kajipur, Kankra, Kankarbagh, Khagaul, Khajurban, Kumrahar, Mahendrughat, Mahmudpur, Maner, Manglichak (Separa), Mithapur, Munachak, Nakhaspur, Nandighat near Naubatpur, Pairapur (Bikararu), Porev near Koilwar, Phulwari Sarif, Rajghat Nawada near Naubatpur, Rajendra Nagar, Rampur, Sekhpur (Maner), Separa, Sopwa and State Food Lab., Mithapur.
11. RANCHI : Bishnupur, Hatia, Horhap, Hundru falls and Namkum.
12. SITAMARHI : Bhasar, Rampathi, Rega, Sonbarsa and Thuma.
13. VAISHALI : Bajidpur, Bhagwanpur (Garol), Garhi (Garol), Ghatro (Lalganj), Jatkaulia, Keshopur, Khadarpur, Khargolia, Kharonatal, Manpura (Belasar), Mansurpur and Mircharam.

SYSTEMATIC ACCOUNT

Order	: ODONATA
Suborder	: ZYGOPTERA
Superfamily	: COENAGRIOIDEA
Family	: PLATYCNEMIDIDAE
Subfamily	: PLATYCNEMIDINAE

Genus *Copera* Kirby1. *Copera marginipes* (Rambur)1842. *Platycnemis marginipes* Rambur, *Ins. Neurop.*, : 240.1933. *Copera marginipes*, Fraser, *Fauna Brit. India*, 1 : 192-197.

Distribution : India (Uttar Pradesh : Dehra Dun, Nainital, Pauri Garhwal, Himachal Pradesh : Kangra, Bihar : Singhbhum, West Bengal, Assam, Karnataka : Coorg, Maharashtra : Pune, Mahabaleshwar, Bombay and Deccan), Nepal, Burma, Sri Lanka, Malaysia, Indonesia (Sumatra, Java, Sunda Island and Sumba) and Thailand.

Remarks : It is one of the commonest species under the genus. A number of varieties of this species occur in the same locality. Specimens of this species are found flying within the dense bushes at the sides of streams as well as the permanent water-bodies.

Family : COENAGRIONIDAE

Subfamily : PSEUDAGRIINAE

Genus *Pseudagrion* Selys2. *Pseudagrion malabaricum* Fraser1924. *Pseudagrion malabaricum* Fraser, *Rec. Indian Mus.*, 26 : 428, 494-495.1933. *Pseudagrion malabaricum*, Fraser, *Fauna Brit. India*, 1 : 284-286.

Material examined : 1 ♂ Hazaribagh lake, 15.3.1983, coll. *M. Prasad*.

Distribution : India (S. India : South Kanara, Kodaikanal, Palni Hills, Ootacamund, Nilgiris, Coorg and Bihar) and Sri Lanka.

Remarks : This species has been discussed in detail by Prasad *et al.*, (in press).

3. *Pseudagrion decorum* (Rambur)1842. *Agrion decorum* Rambur, *Ins. Neurop.*, : 258.1933. *Pseudagrion decorum*, Fraser, *Fauna Brit. India*, 1 : 268-289.

Material examined : 1 ♂ Nakhaspur, 24.3.1971, coll. *B. Nath* and 1 ♀ Separa, 20.7.1968, coll. *Mrs. M. Guha*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	—	20.00 mm	19.00 mm
Female :	—	20.00 mm	19.50 mm

Distribution : India (Bilaspur, Sirmaur, Una, Dehra Dun, Nainital, West Bengal, Ootacamund, Nilgiris, Coorg and West coast), Nepal, Burma and Sri Lanka.

Remarks : It is recorded here for the first time from Bihar. In both sexes the postnodal nervures are 9 in forewing and 8 in hindwing.

4. *Pseudagrion hypermelas* Selys

1876. *Pseudagrion hypermelas* Selys, *Bull. Acad. Belg.*, (2) 42 : 519.

1933. *Pseudagrion hypermelas*, Fraser, *Fauna Brit. India*, 1 : 289-292.

Material examined : 1 ♂ Maner, 14.11.1968, coll. R. K. Varshney and 2 ♂ ♂ Hazaribagh Lake, 15.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	23.00 mm	16.00 mm	15.50 mm

Distribution : India (Punjab, Madhya Pradesh, Deccan area of the Maharashtra and Gujarat).

Remarks : Nine postnodal nervures in forewing and 8 in hindwing. This species is recorded for the first time from Bihar.

5. *Pseudagrion spencei* Fraser

1922. *Pseudagrion spencei* Fraser, *Mem. Dept. Agric. India (Ent.)*, 7 (7) : 47-48.

1933. *Pseudagrion spencei*, Fraser, *Fauna Brit. India*, 1 : 292-294.

Material examined : 3 ♂ ♂ Hatia, Ranchi, 9.3.1983 ; 1 ♂ Namkum, 10.3.1983 and 1 ♂ Ramgarh, 16.3.1983, all coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	22.50 mm	16.00 mm	15.50 mm

Distribution : India (Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Assam and Meghalaya).

6. *Pseudagrion rubriceps* Selys

1876. *Pseudagrion rubriceps* Selys, *Bull. Acad. Belg.*, (2) 42 : 510.

1933. *Pseudagrion rubriceps*, Fraser, *Fauna Brit. India*, 1 : 296-299.

Material examined : 3 ♂ ♂ Netarhat, 7.3.1983 ; 2 ♂ ♂ Namkum,

9.3.1983 ; 2 ♂ ♂ Hatia, 10.3.1983, coll. *M. Prasad* and 3 ♂ ♂ Jatkaulia, 9.8.1984, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	32.00 mm	21.00 mm	20.50 mm

Distribution : Widely distributed throughout continental India [Bilaspur, Hamirpur, Sirmaur, Dehra Dun, Nainital, Pauri, Tehri Garhwal and Bihar (Dhanbad)], Nepal, Burma, Indonesia (Java, Sunda Islands), Malaysia and Taiwan.

Remarks : Only 10-11 postnodal nervures present in forewing and 9 in hindwing.

Genus *Ceriagrion* Selys

7. *Ceriagrion coromandelianum* (Fabricius)

1798. *Agrion coromandelianum* Fabricius, *Ent. Syst. Suppl.*, : 287.

1933. *Ceriagrion coromandelianum*, Fraser, *Fauna Brit. India*, 1 : 315-316.

Material examined : 2 ♂ ♂ Jogipur, 17.10.1965, coll. *D. P. Sanyal* ; 1 ♂ Bhagwanpur near Khagaul, 13.10.1966 coll. *A. P. Kapur* ; 1 ♂ Kankra, 25.10.1968, coll. *T. Venkateswarlu* ; 3 ♂ ♂ Maner, 14.11.1968, coll. *R. K. Varshney* ; 1 ♀ Harding Park, 2.11.1968, coll. *D. P. Sanyal* ; 1 ♂ Naubatpur, 29.7.1969 ; 1 ♂ Khajurban, 18.3.1970, coll. *T. Venkateswarlu* ; 1 ♂ Kankra, 8.5.1970, coll. *B. Nandi* ; 1 ♀ Jogipur, 21.10.1971, coll. *B. Nandi* ; 2 ♂ ♂ Maner, 21.9.1972, coll. *R. K. Varshney* ; 1 ♂ Pairapur, 22.10.1973, coll. *B. Nath* ; 1 ♂ Namkum, 9.3.1983 ; 2 ♂ ♂ Isribazar, 10.3.1983, coll. *M. Prasad* ; 1 ♀ Sekhpura, 6.9.1984 ; 1 ♂, Bherasri Rampur, 27.9.1984 coll. *Y. P. Sinha* ; 1 ♀, Paktola, 13.11.1985 ; 1 ♀ Rupanpatti, 8.3.1986 ; 2 ♀ ♀ Paru, 12.3.1986 ; 3 ♂ ♂ 1 ♀ Laluchhapra, 12.3.1986 ; 1 ♂ Karja, 12.3.1986 ; 1 ♀ Bhasar, 15.3.1986 ; 1 ♀ Riga, 16.3.1986 and 1 ♂, Bhari, 16.11.1986, all coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	30.00 mm	21.00 mm	20.00 mm
Female :	29.50 mm	22.00 mm	21.00 mm

Distribution : India [Bilaspur, Kangra, Hamirpur, Simla, Sirmaur,

Una, Chamoli, Dehra Dun, Nainital, Uttarkashi, Bihar (Pusa, Dhanbad) and West Bengal], Nepal, Burma, Sri Lanka, Malaysia and China.

Remarks : It is one of the common species occurring in Bihar. Postnodal nervures 10-11 present in the forewing and 9 in the hindwing of male. In female 11-12 postnodals present in forewing and 9-10 in hindwing.

8. *Ceriagrion cerinorubellum* (Brauer)

(Fig. 1)

1865. *Pyrrhosoma cerinorubellum* Brauer, *Verh.-zool.-bot. Ges. Wien.*, 15 : 511.

1933. *Ceriagrion cerinorubellum*, Fraser, *Fauna Brit. India*, 1 : 326-328.

Material examined : 1 ♀ Jogipur, 21.10.1971, coll. B. Nandi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Female :	—	21.00 mm	20.00 mm.

Distribution : India (Kangra, Sirmaur, Dehra Dun, West Bengal, Assam and Coorg), Burma, Sri Lanka, Thailand, Malaysia and Indonesia (Sumatra, Java and Borneo).

Remarks : Postnodal nervures 10-12 present in forewing and 9 in hindwing of female. It is recorded here for the first time from Bihar.

Subfamily : ISCHNURINAE

Genus *Aciagrion* Selys

9. *Aciagrion pallidum* Selys

1891. *Aciagrion pallidum* Selys, *Ann. Mus. Civ. Genova*, (2) 10 : 512-513.

1933. *Aciagrion pallidum*, Fraser, *Fauna Brit. India*, 1 : 344-345.

Material examined : 1 ♂ Manigachhi, 14.11.1986, coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	30.00 mm	19.00 mm	18.00 mm

Distribution : India [U. P. : Nainital, Bihar (Singbhum), West Bengal, dry zones of Assam, Western Ghats and Maharashtra], Nepal and Burma.

Remarks : Specimens are found within the long dry grasses of the forest.

Genus *Ischnura* Charpentier

10. *Ischnura senegalensis* (Rambur)

1842. *Agrion senegalensis* Rambur, *Ins. Neurop.*, : 276.

1933. *Ischnura senegalensis*, Fraser, *Fauna Brit. India*, 1 : 348-351.

Material examined : 2 ♂ ♂ Namkum, 9.3.1983 and 1 ♂ Hazaribagh Lake, 15.3.1983, coll. *M. Prasad*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	22.00 mm	13.50 mm	14.00 mm

Distribution : Throughout India [Bilaspur, Sirmour, Dehra Dun, Tehri Garhwal, Bihar (Dhanbad)], France (Monaco), Africa, Burma, Sri Lanka, Philippines, Indonesia (Java, Borneo, Sumba, Timor, Bali, Sumbawa, Lombok, Moluccas and Sunda Island) and Japan.

Remarks : It is the most common Indian damselfly of the genus. Specimens were observed throughout the year on permanent water bodies.

11. *Ischnura aurora* (Brauer)

1858. *Agrion delicatum* Hagen, *Verh. zool.-bot. Ges. Wien.*, 8 : 479.

1865. *Agrion aurora* Brauer, *Verh. zool.-bot. Ges. Wien.*, 15 : 510.

1933. *Ischnura delicata*, Fraser, *Fauna Brit. India*, 1 : 360-362.

1954. *Ischnura aurora*, Lieftinck, *Treubia*, 22 : 74.

Material examined : 1 ♀ Bulandibagh, 31.9.1969, coll. *R. K. Varshney* ; 1 ♀ Asthawa, Bihar Sharif, 5.1.1974, coll. *S. C. Nahar* ; 3 ♂ ♂ 1 ♀ Bishunpur, 5.3.1983 ; 1 ♂ Hazaribagh, 13.3.1983 ; 1 ♂ Madhuban, 19.3.1983, coll. *M. Prasad* ; 1 ♂ Ghatro, Lalganj, 7.8.1984 ; 3 ♀ ♀ Manpura, Belasar, 9.8.1984 ; 1 ♂ Mircharam, 22.9.1985 ; 1 ♂ Khedarpur, 24.1.1985 ; 1 ♂ 1 ♀ Bajidpur, 25.1.1985 ; 1 ♂ Kharnatal, 29.1.1985 ; 2 ♀ ♀ Madhol, 7.3.1986 ; 1 ♂ Garha 9.3.1986 ; 1 ♀ Bhasar, 15.3.1986 ; 1 ♂ Sonbarsa, 17.3.1986 ; 1 ♂ Paktola, 13.11.1986 ; 3 ♂ ♂ Sakri, 14.11.1986 ; 2 ♀ ♀ Khirma, 14.11.1986 ; 2 ♂ ♂ 1 ♀ Thathopur, 16.11.1986 and 2 ♀ ♀ Bahari, 16.11.1986, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	19.50 mm	11.00 mm	10.50 mm
Female :	19.00 mm	16.00 mm	15.00 mm

Distribution : India [Bilaspur, Kangra, Hamirpur, Solan, Una, Dehra Dun, Nainital, Tehri Garhwal, Bihar (Dhanbad) and West Bengal], Burma, Sri Lanka, Malaysia, Philippines, Indonesia (Borneo, Samoa), Sondaic Archipelago, Papua and Australia.

Remarks : It is one of the commonest species occurring throughout India.

12. *Ischnura rufostigma* Selys

1876. *Ischnura rufostigma* Selys, *Bull. Acad. Belg.* (2) 41 : 283.

1933. *Ischnura rufostigma*, Fraser, *Fauna Brit. India*, 1 : 362-364.

Distribution : India (H.P. : Kangra, U.P. : Nainital, Bihar, Madhya Pradesh, West Bengal and Assam).

Genus *Rhodischnura* Laidlaw13. *Rhodischnura nursei* (Morton)

1907. *Ischnura nursei* Morton, *Trans. Ent. Soc. Lond.*, : 306-307.

1933. *Rhodischnura nursei*, Fraser, *Fauna Brit. India*, 1 : 369-371.

Distribution : India (U. P. : Dehra Dun, Nainital, Pauri Garhwal, Bihar, Madhya Pradesh and West Bengal) and Pakistan (Karachi and Hyderabad, Sind).

Genus *Enallagma* Charpentier14. *Enallagma parvum* Selys

1876. *Enallagma parvum* Selys, *Bull. Acad. Belg.*, (2) 41 : 537.

1933. *Enallagma parvum*, Fraser, *Fauna Brit. India*, 1 : 376-378.

Distribution : Throughout India, Nepal, Burma and Sri Lanka.

Remarks : It is a small damselfly, and is found fluttering on the weedy tanks almost throughout the year.

Subfamily : AGRIOCNEMINAE

Genus *Agriocnemis* Selys

15. *Agriocnemis lacteola* Selys

1877. *Agriocnemis lacteola* Selys, *Bull. Acad. Belg.*, (2) 43 : 144.

1933. *Agriocnemis lacteola*, Fraser, *Fauna Brit. India*, 1 : 381-383.

Material examined : 1 ♂ Namkum, 9.3.1983 ; 1 ♂ Topchanchi, 20.3.1983, coll. M. Prasad and 1 ♂ Manigachhi, 14.11.1986, coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	17.00 mm	9.50 mm	9.00 mm

Distribution : India (West Bengal, Sikkim and Assam).

Remarks : Six postnodal nervures in forewing and 5 in hindwing. Specimens of this species were seen flying within the grassy patches of lands near the permanent water bodies. It is recorded here for the first time from Bihar.

16. *Agriocnemis splendidissima* Laidlaw

1919. *Agriocnemis splendidissima* Laidlaw, *Rec. Indian Mus.*, 16 : 180-182.

1933. *Agriocnemis splendidissima*, Fraser, *Fauna Brit. India*, 1 : 392-394.

Material examined : 1 ♂ Hazaribagh, 13.3.1986, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	18.50 mm	10.00 mm	9.50 mm

Distribution : India (Western Ghats and Madhya Pradesh).

Remark : It is recorded here for the first time from Bihar.

17. *Agriocnemis pygmaea* (Rambur)

1842. *Agrion pygmaeum* Rambur, *Ins. Neurop.*, : 278.

1933. *Agriocnemis pygmaea*, Fraser, *Fauna Brit. India*, 1 : 398-401.

Material examined : 1 ♂ Bishnupur, 5.3.1983 ; 2 ♂ ♂ 2 ♀ ♀ Hazaribagh National Park, 14.3.1983 ; 1 ♂ Ramgarh, 16.3.1983 ; 3 ♂ ♂ 2 ♀ ♀ Tetulmari, 22.3.1983 ; 1 ♂ Sindri, 23.3.1983 all coll. M. Prasad ; 1 ♂ Ghatro, Lalganj 7.8.1984 ; 1 ♂ Misrauli (Simru), 13.11.1986 ;

3 ♂♂ Sakri, 14.11.1986 ; 1 ♂ Khrima, 14.11.1986 ; 1 ♂ 1 ♀ Manigachhi, 14.11.1986 and 1 ♂ Bahari, 16.11.1986 coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	17.00 mm	10.00 mm	9.00 mm
Female :	18.00 mm	12.00 mm	11.50 mm

Distribution : Throughout India, Nepal, Burma, Sri Lanka, Singapore, Philippines (Manila), Seychelles (Indian Ocean), Taiwan, Indonesia (Java, North Celebes, Sunda Island), China, Papua (New Guinea) and Australia.

Subfamily : COENAGRIINAE

Genus *Coenagrion* Kirby

18. *Coenagrion dyeri* (Fraser)

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

1933. *Coenagrion dyeri*, Fraser, *Fauna Brit. India*, 1 : 413-415.

Material examined : 1 ♂ Upper Ghagri, Netarhat, 6.3.1983 ; 1 ♂ Hatia, 10.3.1983 ; 1 ♂ Hazaribagh, 13.3.83 ; 2 ♂♂ Hazaribagh, 15.3.1983 ; 2 ♂♂ Isribazar, 18.3.1983 and 1 ♂ Sindri, 23.3.1983 ; all coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	22.00-22.50 mm	16.50 mm	16.00 mm

Distribution : India (Throughout peninsula including Madhya Pradesh and Western Ghats) and Upper Burma.

Remarks : It is recorded here for the first time from Bihar.

Subfamily : ARGINAE

Genus *Onychargia* Selys

19. *Onychargia atrocyana* (Selys)

1865. *Onychargia atrocyana* Selys, *Bull. Acad. Belg.*, (2) 20 : 416.

1933. *Onychargia atrocyana*, Fraser, *Fauna Brit. India*, 1 : 417-418.

Distribution : India (West Bengal, Assam, North Coorg, Malabar and Anaimalai Hills) ; Burma and Sri Lanka.

Remarks : Males of this species were observed at Chirayatar and Kankarbagh localities of Patna, by one of us (M. P.) in February, 1987, but could not be collected. Adults were observed resting on the plants in a grassy patch. This species is recorded here for the first time from Bihar.

Superfamily : LESTINOIDEA

Family : LESTIDAE

Subfamily : LESTINAE

Genus *Lestes* Leach

20. *Lestes viridula* Rambur

1842. *Lestes viridula* Rambur, *Hist. Nat. Ins. Neurop.*, : 252-253.

1933. *Lestes viridula*, Fraser, *Fauna Brit. India*, 1 : 45-46.

Material examined : 1 ♂ Netarhat, 12.3.1971, coll. B. Nath ; 1 ♂ 1 ♀ Upper Ghagri, Netarhat, 6.3.1983, coll. M. Prasad and 1 ♂ Chhapra, 11.3.1986, coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	32.00 mm	23.00 mm	22.00 mm

Distribution : India (Kangra, Bilaspur, Dehra Dun, Nainital, Pauri Garhwal, Deccan, Western India, South Coorg and Bombay).

Remarks : Postnodal nervures 9-10 present in forewing and 10-11 in hindwing. It is recorded here for the first time from Bihar.

21. *Lestes nodalis* Selys

1891. *Lestes nodalis* Selys, *Ann. Mus. Civ., Genova*, (2) 10 : 496-497.

1933. *Lestes nodalis*, Fraser, *Fauna Brit. India*, 1 : 51-53.

Distribution : India [Bihar (Singhbhum) and Assam] ; Burma and China (Yunnan).

22. *Lestes thoracica* Laidlaw

1920. *Lestes thoracica* Laidlaw, *Rec. Indian Mus.*, 19 : 152-153.

1933. *Lestes thoracica*, Fraser, *Fauna Brit. India*, 1 : 56-57.

Distribution : India (Dehra Dun, Bihar, West Bengal and Orissa).

23. *Lestes nigriceps* Fraser

1924. *Lestes nigriceps* Fraser, *Mem. Dept. Agric. India (Ent.)*, 8 : 85.

1933. *Lestes nigriceps*, Fraser, *Fauna Brit. India*, 1 : 55-56.

Distribution : India (Bihar : Pusa).

Remarks ; This species is known by its original record from Bihar only.

24. *Lestes umbrina* Selys

1891. *Lestes umbrina* Selys, *Ann. Mus. Civ., Genova*, (2) 10 : 497-498.

1933. *Lestes umbrina*, Fraser, *Fauna Brit. India*, 1 : 53-55.

Distribution : India [Uttar Pradesh, Bihar (Singhbhum), West Bengal, Gujarat : Cutch and Maharashtra (Panch Mahal)] ; China (Yunnan) and Burma.

Superfamily : AGROIDEA

Family : CALOPTERYXIDAE

Genus *Neurobasis* Selys

25. *Neurobasis chinensis chinensis* (Linn.)

1758. *Libellula chinensis* Linnaeus, *Syst. Nat.*, 1 : 545.

1934. *Neurobasis chinensis chinensis*, Fraser, *Fauna Brit. India*, 2 : 121-124.

Distribution : India [H. P. : Kangra, Bilaspur, Mandi, Simla and Sirmaur, U. P. : Dehra Dun, Nainital, Pauri and Tehri Garhwal, Uttar Kashi, Bihar (Singhbhum), West Bengal, Assam, Karnataka, Maharashtra and Tamil Nadu] ; Nepal ; Burma ; Sri Lanka and Thailand.

Genus *Vestalis* Selys

26. *Vestalis gracilis gracilis* (Rambur)

1842. *Calopteryx gracilis* Rambur, *Ins. Neurop.*, : 224.

1934. *Vestalis gracilis gracilis*, Fraser, *Fauna Brit. India*, 2 : 126-128.

Distribution : India [Bihar (Singhbhum), West Bengal, Assam] ; Burma ; Thailand and Vietnam (Annam and Tonkin).

Suborder : ANISOPTERA
 Superfamily : AESHNOIDEA
 Family : GOMPHIDAE
 Subfamily : GOMPHINAE
 Genus **Anormogomphus** Selys

27. **Anormogomphus heteropterus** Selys

1854. *Anormogomphus heteropterus* Selys, *Bull. Acad. Belg.*, (2) 21 : 61.
 1934. *Anormogomphus heteropterus*, Fraser, *Fauna Brit. India*, 2 : 174-176.

Distribution : India (Kangra, Dehra Dun, Punjab and Bihar) and Pakistan.

Genus **Platygomphus** Selys

28. **Platygomphus dolabratus** Selys

1854. *Platygomphus dolabratus* Selys, *Bull. Acad. Belg.*, (2) 21 : 44.
 1934. *Platygomphus dolabratus*, Fraser, *Fauna Brit. India*, 2 : 208-210.

Distribution : India (Bihar and West Bengal).

Genus **Onychogomphus** Selys

29. **Onychogomphus grammicus** Rambur

1842. *Gomphus grammicus* Rambur, *Ins. Neurop.*, : 164.
 1934. *Onychogomphus grammicus*, Fraser, *Fauna Brit. India*, 2 : 256-257.

Distribution : India [Uttar Pradesh and Bihar (Pusa)].

Genus **Nepogomphus** Fraser

30. **Nepogomphus modestus** (Selys)
 (Fig. 2)

1878. *Onychogomphus modestus* Selys, *Bull. Acad. Belg.*, (2) 46 : 423.
 1934. *Nepogomphus modestus*, Fraser, *Fauna Brit. India*, 2 : 285-286.

Material examined : 1 ♂ Horhap, Ranchi, 19.2.1971, coll. B. Nath.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	—	25.00 mm	23.50 mm

Distribution : India (Kangra, Sirmaur, Dehra Dun, West Bengal, Meghalaya and Nagaland) ; Burma ; Malaysia and Indonesia (Sumatra).

Remarks : It is recorded here for the first time from Bihar.

Subfamily : LINDENIINAE

Genus *Ictinogomphus* Rambur31. *Ictinogomphus rapax* (Rambur)1842. *Diastatomma rapax* Rambur, *Ins. Neurop.*, : 169.1934. *Ictunus rapax*, Fraser, *Fauna Brit. India*, 2 : 373-376.1976. *Ictinogomphus rapax*, Kumar & Juneja, *Newsl. zool. Surv. India*, 2(2) : 95.

Material examined : 1 ♂ Separa, 20.7.1968, coll. *M. Guha* ; 1 ♂ Maner, 4.8.1968 and 1 ♂ Nakhaspur, 4.9.1968, coll. *T. Venkateswarlu*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	52.00 mm	43.00 mm	41.50 mm

Distribution : India [Kangra, Sirmaur, Dehra Dun, Madhya Pradesh, Bihar (Dhanbad), West Bengal, Sikkim, Karnataka and Kerala] ; Nepal ; Burma ; Sri Lanka and Malaysia.

Family : AESHNIDAE

Subfamily : GYNACANTHAGINAE

Genus *Gynacantha* Rambur32. *Gynacantha hyalina* Selys1882. *Gynacantha hyalina* Selys, *Ann. Soc. Espan. Hist. Nat.*, 11 : 19.1936. *Gynacantha hyalina*, Fraser, *Fauna Brit. India*, 3 : 97-100.

Distribution : India [Bihar (Pusa), West Bengal, Assam, Meghalaya, Malabar, Wynaad, Coorg and Coimbatore] ; Burma ; Thailand ; Indonesia (Borneo) ; China and Japan.

33. *Gynacantha biharica* Fraser1927. *Gynacantha biharica* Fraser, *Rec. Indian Mus.*, 29 : 74-75.1936. *Gynacantha biharica*, Fraser, *Fauna Brit. India*, 3 : 111.*Distribution* : India (Bihar : Pusa).*Remarks* : Known by its original record from Bihar only.34. *Gynacantha albistyla* Fraser1927. *Gynacantha albistyla* Fraser, *Rec. Indian Mus.*, 29 : 75-76.1936. *Gynacantha albistyla*, Fraser, *Fauna Brit. India*, 3 : 112-113.*Distribution* : India (Bihar : Pusa and West Bengal).

Subfamily : ANACTINAE

Genus **Anax** Leach35. **Anax guttatus** (Burmeister)1839. *Aeschna guttata* Burmeister, *Handb. Ent.*, 2 : 840.1936. *Anax guttatus*, Fraser, *Fauna Brit. India*, 3 : 140-142.*Material examined* : 1 ♂ Kankarbagh, 9.7.1974, coll. *K. P. Singh*.*Measurements* :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	58.00 mm	52.50 mm	51.00 mm

Distribution : India (Kangra, Dehra Dun, Punjab, East Himalaya, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala) ; Nepal ; Burma ; Sri Lanka ; Seychelles ; Malaysia ; Taiwan ; Samoa Island ; Indonesia (Lesser Sunda Island, Java) ; Micronesia and North Australia.

Remarks : Our material agrees fairly well with the published description of the species, except that pterostigma covers 3 cells ; discoidal cell of forewing containing 7 cells and hindwing 5 cells, and 4 cells in the cubital nervures of hindwing. It is recorded here for the first time from Bihar.

Superfamily : LIBELLULOIDEA

Family : LIBELLULIDAE

Subfamily : LIBELLULINAE

Genus **Potamarcha** Karsch36. **Potamarcha congener** (Rambur)1842. *Libellula obscura* Rambur, *Ins. Neurop.*, : 64.1842. *Libellula congener*, Rambur, *Ins. Neurop.*, : 70.1890. *Potamarcha obscura*, Karsch, *Berlin Ent. Zeit.*, 33 : 371.1891. *Potamarcha congener*, Selys, *Ann. Soc. Espan*, 20 : 221.1936. *Potamarcha obscura*, Fraser, *Fauna Brit. India*, 3 : 289-291.

Material examined : 1 ♀ Kankarbagh, 28.10.1967, coll. *R. N. Verma* ; 1 ♀ Lower Ghagri, Netarhat, 13.2.1971, coll. *B. Nath* ; 1 ♀ Mahmudpur, 30.11.1973, coll. *S. C. Nahar* ; 1 ♀ Namkum, 9.3.1983 ; 1 ♀ Hundru Falls, 11.3.1983, coll. *M. Prasad* ; 1 ♀ Madhopur, 13.7.1984, coll. *L. P. Gupta* ; 1 ♀ Bhojpur, 17.7.1984 ; 1 ♂ Piro, 18.7.1984 ;

2 ♂ ♂ Bahadurganj, 18.7.1984, coll. *Y. P. Sinha* ; 2 ♂ ♂ Khargolia, 8.8.1984 ; 1 ♀ Keshopur, 8.8.1984 ; 1 ♀ Manpura, Belwar, 9.8.1984, coll. *Y. Chaturvedi* ; 1 ♀ Gajraj Ganj, 15.9.1984 ; 1 ♂ 4 ♀ ♀ Srinagar, Bhakura, 19.9.1984 ; 3 ♂ ♂ 2 ♀ ♀ Kulharia, 25.9.1984 ; 1 ♂ 1 ♀ Jamira, 26.9.1984 and 1 ♂ Manjharua, 27.9.1984, all coll. *Y. P. Sinha*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	29.50 mm	35.00 mm	34.00 mm
Female :	29.00 mm	35.00 mm	34.00 mm

Distribution : India [Kangra, Dehra Dun, Bihar (Singhbhum, Dhanbad), Madhya Pradesh, West Bengal, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra] ; Nepal ; Burma ; Sri Lanka ; Philippines ; Taiwan ; Malaya Archipelago ; Indonesia (Java, Sumatra) ; Papua (New Guinea) and North Australia.

Remarks : It is one of the common dragonfly species of Bihar.

Genus *Orthetrum* Newman

37. *Orthetrum brunneum brunneum* (Fonscolombe)

1837. *Libellula brunnea* Fonscolombe, *Ann. Soc. Ent. France*, 6 : 141.

1936. *Orthetrum brunneum brunneum*, Fraser, *Fauna Brit. India*, 3 : 294-295.

Distribution : India (Jammu & Kashmir, H. P. : Sirmaur, U. P. : Almora, Dehra Dun, Tehri Garhwal, Uttar Kashi, Bihar : Singhbhum) and South Europe ; North Africa ; West Asia (Asia Minor) ; Iraq (Mesopotamia) ; Afghanistan ; Pakistan and Burma.

38. *Orthetrum taeniolatum* (Schneider)

1845. *Libellula taeniolata* Schneider, *Stett. Ent. Zeit.*, 6 : 111.

1936. *Orthetrum taeniolatum*, Fraser, *Fauna Brit. India*, 3 : 296-298.

Material examined : 1 ♀ Khajurban, 18.3.1970, coll. *T. Venkateswarlu* and 1 ♀ Namkum, 9.3.1983, coll. *M. Prasad*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Female :	21.00 mm	27.00 mm	26.00 mm

Distribution : India including dry zones and hot plains (Bilaspur, Kangra, Kinnaur, Una, Chamoli, Dehra Dun, Nainital, Pauri and Tehri

Garhwal, Uttar Kashi, Madhya Pradesh, West Bengal and Sikkim) ; Nepal and countries bordering Mediterranean.

Remarks : It is recorded here for the first time from Bihar.

39. *Orthetrum sabina* (Drury)

1770. *Libellula sabina* Drury, *Ill. Exot. Ins.*, 1 : 114.

1936. *Orthetrum sabina*, Fraser, *Fauna Brit. India*, 3 : 300-302.

Material examined : 1 ♀ Kankarbagh, 20.4.1967, coll. R. N. Verma ; 1 ♂ Manglichak near Separa, 14.7.1967, coll. T. Venkateswarlu ; 1 ♀ Maner, 20.11.1967, coll. K. K. Mahajan ; 1 ♀ Kankarbagh, 28.12.1967, coll. R. N. Verma ; 1 ♂ 1 ♀ Jogipur, 21.10.1971, coll. B. Nandi ; 2 ♂ ♂ Maner, 21.9.1972 ; 1 ♀ Digha, 5.11.1973 ; 2 ♀ ♀ Danapur, 28.12.1973, all coll. R. K. Varshney ; 1 ♂ Agricultural farm, Netarhat, 7.3.1983, coll. M. Prasad ; 1 ♂ Bhojpur (Sinha Ghat), 19.7.1984, coll. Y. P. Sinha ; 1 ♀ Manpur, Belasar, 9.8.1984 and 1 ♀ Vaishali, 23.1.1985, coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	34.00 mm	32.50 mm	31.50 mm
Female :	33.00 mm	31.50-33.00 mm	30.50-33.00 mm

Distribution : India [Bilaspur, Kangra, Sirmaur, Solan, Una, Dehra Dun, Nainital, Pauri Garhwal and Bihar (Singhbhum, Dhanbad)] ; Somalia (Somali land) ; Iraq ; Iran ; Nepal ; Sri Lanka ; Burma ; Thailand ; Micronesia (Oceania) ; Samoa Island (Pacific Ocean), Indonesia (Java, Sumba, Timor) ; Papua (New Guinea) ; Australia ; Egypt ; Angola and most of African Continent.

40. *Orthetrum pruinatum neglectum* (Rambur)

1842. *Libellula neglecta* Rambur, *Ins. Neurop.*, : 86.

1936. *Orthetrum pruinatum neglectum*, Fraser, *Fauna Brit. India*, 3 : 311-313.

Material examined : 2 ♂ ♂ 4.2.1971, coll. B. Nath and 1 ♂ Agricultural Farm, Netarhat, 7.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	20.00-27.00 mm	32.00-33.00 mm	31.00-32.00 mm

Distribution : India [H. P. : Bilaspur, Kangra, Kinnaur, Kulu, Sirmaur, Solan, U. P. : Chamoli, Dehra Dun, Nainital, Pauri and Tehri Garhwal, Uttar Kashi and Bihar : Dhanbad] ; Nepal ; Burma ; Sri Lanka ; Hong Kong ; Thailand and Malaya.

Remarks : Nodal index varies from $\frac{8-13\frac{1}{2} | 14\frac{1}{2}-9}{10-11 | 11-11}$ to $\frac{9-13\frac{1}{2} | 14\frac{1}{2}-9}{10-11 | 11-11}$.

41. *Orthetrum chandrabali* Mehrotra

1959. *Orthetrum chandrabali* Mehrotra, *Indian J. Ent.*, 21 : 137-139.

Distribution : India (Bihar : Horhap).

Remarks : Known by its original record from Bihar only.

42. *Orthetrum ganeshii* Mehrotra

1959. *Orthetrum ganeshii* Mehrotra, *Indian J. Ent.*, 21 : 137-139.

Distribution : India (Bihar : Horhap).

Remarks : Known by its original record from Bihar only.

Subfamily : PALPOPLEURINAE

Genus *Palpopleura* Rambur

43. *Palpopleura sexmaculata sexmaculata* (Fabricius)

1787. *Libellula sexmaculata* Fabricius, *Mant. Ins.*, 1 : 338.

1936. *Palpopleura sexmaculata sexmaculata*, Fraser, *Fauna Brit. India*, 3 : 318-320.

Material examined : 1 ♂ 1 ♀ Bishnupur, 5.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	15.00 mm	18.50 mm	18.00 mm
Female :	14.00 mm	19.00 mm	19.50 mm

Distribution : India [Bilaspur, Hamirpur, Kangra, Kulu, Chamoli, Dehra Dun, Nainital, Pauri and Tehri Garhwal, Uttar Kashi, Bihar (Singhbhum), West Bengal, Assam, Tamil Nadu, Andhra Pradesh and Karnataka] ; Nepal ; Burma ; Malaysia and China.

Subfamily : BRACHYDIPLACINAE

Genus **Brachydiplax** Brauer

44. **Brachydiplax sobrina** (Rambur)

(Fig. 4)

1842. *Libellula sobrina* Rambur, *Ins. Neurop.*, : 114.

1936. *Brachydiplax sobrina*, Fraser, *Fauna Brit. India*, 3 : 325-327.

Material examined : 1 ♀ Kumrahar, 25.7.1969, coll. *D. P. Sanyal* ;
1 ♂ Piro, 18.7.1984, coll. *Y. P. Sinha* and 1 ♀ Khargolia, 8.8.1984,
coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	19.50 mm	26.00 mm	25.50 mm
Female :	—	26.00 mm	25.00 mm

Distribution : India [Kangra, Dehra Dun, Bihar (Dhanbad), West Bengal, Assam, Malabar, Coorg, Fraserpet, Travancore and Bangalore] ;
Burma and Sri Lanka.

Remarks : Nodal index varies from $\frac{5-6}{6-5} | \frac{5-6}{5-6}$ to $\frac{5-7}{5-6} | \frac{7-5}{6-5}$.

Subfamily : SYMPETRINAE

Genus **Acisoma** Rambur

45. **Acisoma panorpoides panorpoides** Rambur

1842. *Acisoma panorpoides* Rambur, *Ins. Neurop.*, : 28.

1936. *Acisoma panorpoides panorpoides*, Fraser, *Fauna Brit. India*, 3 : 330-331.

Material examined : 1 ♂ Shri Tola, 24.7.1972, coll. *B. Nandi* ; 1 ♂
Hazaribagh Lake, 15.3.1983, coll. *M. Prasad* and 1 ♀ Harinagar,
17.7.1984, coll. *Y. P. Sinha*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	—	21.00 mm	20.00 mm
Female :	17.00 mm	20.00 mm	20.00 mm

Distribution : India [Kangra, Sirmaur, Dehra Dun, Nainital, Pauri Garhwal, Uttar Kashi, Bihar (Dhanbad), Madhya Pradesh, West Bengal,

Sikkim and Assam]; Nepal; Sri Lanka; Philippines; Singapore; Malayan Archipelago; Indonesia (Java, Bali, Sumatra, Celebes, Sumba, Lesser Sunda Island); China; Thailand and Japan.

Genus **Diplacodes** Kirby

46. **Diplacodes nebulosa** (Fabricius)

1793. *Libellula nebulosa* Fabricius, *Ent. Syst.*, 2 : 379.

1936. *Diplacodes nebulosa*, Fraser, *Fauna Brit. India*, 3 : 335-336.

Material examined : 1 ♂ 1 ♀ Kumrahar, 2.12.1968, coll. Mrs. M. Guha; 1 ♂ Sopwa, 20.7.1968, coll. Mrs. M. Guha; 1 ♂ Garhia near Garol, 9.8.1984; 1 ♂ Madhol, 7.3.1986; 1 ♂ Baikatpur, 8.3.1986 and 2 ♂ ♂ Paktola, 13.11.1986, all coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	—	20.00-21.00 mm	18.50-20.00 mm
Female :	14.50 mm	20.50 mm	18.00 mm

Distribution : Throughout India in wet and semi-wet areas [Kangra, Dehra Dun, Nainital, Bihar (Dhanbad), Madhya Pradesh, Eastern Himalaya, Maharashtra and Karnataka]; Nepal; Burma; Sri Lanka; Thailand; W. Malaysia: Malacca and Indonesia (Sumatra).

Remarks : Only one row of cell in between IRiii and Rspl.; discoidal cell entire; discoidal field begins with two rows of cells. Nodal index varies from $\frac{5-6 | 7-5}{5-6 | 7-5}$ to $\frac{5-7 | 8-5}{5-6 | 7-5}$. It is a common species found throughout India. Adults are commonly seen at the side of water bodies and nearby grassy patches. Specimens were observed in tandem as well as in wheel position.

47. **Diplacodes trivialis** (Rambur)

1842. *Libellula trivialis* Rambur, *Ins. Neurop.*, : 115.

1936. *Diplacodes trivialis*, Fraser, *Fauna Brit. India*, 3 : 336-338.

Material examined : 1 ♂ Kumrahar, 23.6.1966, coll. S. P. Prasad; 1 ♂ Agricultural farm Patna, 17.8.1967, coll. K. K. Mahajan; 1 ♂ 2 ♀ ♀ Harding Park, 19.10.1967, coll. M. Guha; 2 ♀ ♀ State Food Lab., Patna, 5.9.1967, coll. M. Guha; 1 ♀ Harding Park, 9.10.1968,

coll. *R. K. Varshney*; 1 ♀ Jogipur, 17.10.1968; 1 ♀ Rampur, 17.10.1968, coll. *D. P. Sanyal*; 1 ♀ Kumrahar, 25.7.1969, coll. *R. K. Varshney*; 1 ♀ Munna chak, 10.4.1970; 1 ♀ Jogipur, 21.10.1971; 1 ♀ Rampur, 21.10.1971, coll. *B. Nandi*; 1 ♀ Pairapur, 22.10.1973, coll. *B. Nath*; 1 ♂ Digha, 5.11.1973; 1 ♀ Danapur, 28.12.1973, coll. *R. K. Varshney*; 1 ♂ Bishnupur, 5.3.1983, coll. *M. Prasad*; 2 ♂ ♂ 4 ♀ ♀ Harigaon, 17.7.1984; 2 ♂ ♂ Piro, 18.7.1984; 1 ♂ Bahadurganj, 18.7.1984; 2 ♂ ♂ Sinha ghat, Bhojpur, coll. *Y. P. Sinha*; 1 ♀ Manpura, 9.8.1984, coll. *Y. Chaturvedi*; 2 ♂ ♂ 3 ♀ ♀ Ghataro near Lalganj, 7.8.1984, coll. *Y. Chaturvedi*; 2 ♀ ♀ Khagaul, 6.9.1984; 1 ♂ Gajrajganj, 15.9.1984, coll. *Y. P. Sinha*; 1 ♀ Baikatpur, 8.3.1986; 1 ♀ Baruraj, 11.3.1986; 1 ♀ Sahibganj, 11.3.1986; 1 ♀ Laluchhapra, 12.3.1986; 2 ♂ ♂ Saraya, 12.3.1986; 1 ♂ 6 ♀ ♀ Rampathi, 15.3.1986; 1 ♂ Manigachhi, 14.11.1986; 1 ♀ Chikni, 15.11.1986; 1 ♂ Thathopur, 16.11.1986; 1 ♀ Bahari, 16.11.1986; 1 ♂ Bahadurpur, 16.11.1986; 1 ♀ Darbara, 16.11.1986 and 3 ♀ ♀ Kharsa, 18.11.1986, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	20.00 mm	24.00 mm	22.00 mm
Female :	19.00 mm	24.00 mm	21.50 mm

Distribution : Throughout India in wet and semi-wet areas [H. P. : Kangra, U. P. : Dehra Dun, Nainital, Bihar (Dhanbad), Madhya Pradesh, Eastern Himalaya, West Bengal, Karnataka and Maharashtra], Nepal; Burma; Sri Lanka; Thailand; W. Malaysia (Malacca) and Indonesia (Sumatra).

Remarks : Nodal index varies from $\frac{6-7}{5-5} \mid \frac{7-6}{5-6}$ to $\frac{6-8}{6-6} \mid \frac{8-6}{6-7}$.

It is one of the commonest species and found throughout the year near water bodies. Sometimes it is also seen in the grassy vegetation. Specimens are very common during monsoon and post-monsoon period. Adults can be seen in tandem as well as in wheel position.

Genus *Crocothemis* Brauer

48. *Crocothemis servilia servilia* (Drury)

1770. *Libellula servilia* Drury, *Ill. Ex. Ins.*, 1 : 6.

1936. *Crocothemis servilia servilia*, Fraser, *Fauna Brit. India*, 3 : 345-347.

Material examined : 1 ♂ Maner, 28.6.1967 ; 1 ♂ Daniawa (Fatuha), 23.8.67, coll. *T. Venkateswarlu* ; 1 ♀ State Food lab., 5.9.1967, coll. *M. Guha* ; 2 ♀ ♀ Kankarbagh, 28.10.1967, coll. *R. N. Verma* ; 1 ♂ Begampur, 22.4.1968, coll. *D. P. Sanyal* ; 3 ♂ ♂ Separa, 20.7.1968, coll. *M. Guha* ; 3 ♂ ♂ 1 ♀ Nakhaspur, 4.9.1968, coll. *T. Venkateswarlu* ; 1 ♂ Kankarbagh, 20.10.1969, coll. *R. N. Verma* ; 1 ♀ Bulandibagh, 3.12.1969, coll. *R. K. Varshney* ; 1 ♀ Kumrahar, 8.5.1970, coll. *B. Nandi* ; 2 ♀ ♀ Rampur, 21.10.1971, coll. *B. Nath* ; 1 ♀ Pairapur, 22.10.1972, coll. *B. Nath* ; 1 ♂, Digha 5.11.1973 ; 1 ♀, Bishnupur, 5.3.1983 ; 1 ♂ Agricultural farm, Netarhat, 7.3.1983, coll. *M. Prasad* ; 1 ♀ Sinha Ghat (Bhojpur), 19.7.1984, coll. *Y. P. Sinha* ; 1 ♀ Khargolia, 8.8.1984 ; 1 ♀ Keshopur, 8.8.1984 ; 1 ♀ Bhagwanpur (Garol), 9.8.1984 ; 1 ♀ Manpur, Belasar, 9.8.1984 and 1 ♂ Hayaghat, 18.11.1986, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	27.50-28.00 mm	33.00-34.00 mm	32.00 mm
Female :	22.00-23.00 mm	29.00-30.00 mm	28.50-29.00 mm

Distribution : India [H. P. : Kangra, U. P. : Chamoli, Dehra Dun, Nainital, Pauri Garhwal, Madhya Pradesh, Bihar (Singhbhum, Dhanbad) and West Bengal], Iraq ; Nepal ; Burma ; Sri Lanka ; Philippines ; Indonesia (Sumba) ; Australia ; Sundaic Archipelago and Japan.

Remarks : A common species occurring in vegetation around larval habitats. Adults can be seen throughout the year on wing. Teneral males and females are similar in colour, and one may be confused on account of their pale straw-yellow colour. It is quite different from the mature male stage.

Genus **Bradinopyga** Kirby

49. **Bradinopyga geminata** (Rambur)

1842. *Libellula geminata* Rambur, *Ins. Neurop.*, : 90.

1936. *Bradinopyga geminata*, Fraser, *Fauna Brit. India*, 3 : 349-350.

Material examined : 4 ♂ ♂ 1 ♀ Mithapur, 5.9.1967, coll. *M. Guha* and 1 ♀ Kazipur, 25.9.1973, coll. *D. Sengupta*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	29.50 mm	35.00 mm	34.00 mm
Female :	27.50 mm	34.00-35.50 mm	33.50-34.00 mm

Distribution : India [Dehra Dun, Nainital, Delhi, Madhya Pradesh, Bihar (Dhanbad), West Bengal, Eastern Himalaya and Peninsular India] and Sri Lanka.

Remarks : Discoidal cell in forewing traversed only once, but in hindwing entire. Anal triangle 3 celled, discoidal field begins with 3 rows of cells. Nodal index varies from $\frac{8-11\frac{1}{2}}{9-9} | \frac{11\frac{1}{2}-8}{9-9}$ to $\frac{9-12\frac{1}{2}}{9-9} | \frac{11\frac{1}{2}-8}{10-9}$.

This species is found in cultivated and occupied areas, near wells, small cemented tanks, plastered cemented walls or sometimes large steel drums etc. It is common from March to October.

Genus *Neurothemis* Brauer50. *Neurothemis fulvia* (Drury)

1773. *Libellula fulvia* Drury, *Ill. Exot. Ins.*, 2 : 84.

1936. *Neurothemis fulvia*, Fraser, *Fauna Brit. India*, 3 : 353-354.

Distribution : Throughout India [H. P. ; Sirmour, U. P. : Dehra Dun, Nainital and Bihar (Singhbhum)], Iraq ; Seychelles (Indian ocean) ; Nepal ; Burma ; Sri Lanka ; Taiwan ; Thailand ; Indonesia (Sunda Island ; Timor, Sumba) ; Philippines ; Micronesia (Pacific ocean) ; Japan and Australia.

Remarks : Adults of this species are very conspicuous because of their rusty wings. Due to its hopping flight, it is difficult to collect the adults at its larval habitats.

51. *Neurothemis intermedia intermedia* (Rambur)

1842. *Libellula intermedia* Rambur, *Ins. Neurop.*, : 91.

1936. *Neurothemis intermedia intermedia*, Fraser, *Fauna Brit. India*, 3 : 357-358.

Distribution : India [H. P. : Kangra, U. P. : Dehra Dun, Madhya Pradesh, Bihar (Singhbhum), West Bengal, Maharashtra : Bombay, Deccan and Mahabaleswar], Nepal ; Burma ; Sri Lanka ; W. Malaysia (Malacca) and China.

52. *Neurothemis tullia tullia* (Drury)

(Fig. 3)

1773. *Libellula tullia* Drury, *Ill. Exot. Ins.*, 2 : 85.1936. *Neurothemis tullia tullia*, Fraser, *Fauna Brit. India*, 3 : 360-362.

Material examined : 2 ♂♂ Manpura, Belasar, 9.8.1984, coll. Y. Chaturvedi ; 1 ♂, Englishpur, 25.9.1984 coll. Y. P. Sinha and 1 ♀, Misrawli (Simri) 13.11.1986 coll. Y. Chaturvedi.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	19.50 mm	25.00 mm	24.00 mm
Female :	19.00 mm	25.00 mm	24.00 mm

Distribution : India [H. P. : Kangra, Sirmaur, Una, U. P. : Dehra Dun, Madhya Pradesh, Rajasthan, Bihar : (Singhbhm), West Bengal, East Himalaya, West Coast, Maharashtra, Karnataka and Tamil Nadu], W. Malaysia (Penang, Malacca) ; Thailand and China.

Remarks : Cubital nervures 5-7 present in forewing, but only 2 in hindwing. Discoidal cell traversed once or twice in forewing. Adults are weak in flight and flutter on aquatic vegetation, near swampy areas and weedy tanks, in large colonies. Teneral males and females are similar in colour.

Genus *Brachythemis* Brauer53. *Brachythemis contaminata* (Fabricius)1793. *Libellula contaminata* Fabricius, *Ent. Syst.*, 2 : 382.1936. *Brachythemis contaminata*, Fraser, *Fauna Brit. India*, 3 : 365-366.

Material examined : 2 ♂♂ Bihta, 3.8.1967 ; 1 ♂ Daniawa (Fatuha), 23.8.1967 ; 1 ♂ Maner, 11.9.1976 ; 1 ♂ 1 ♀ Maner, 27.4.1968, coll. T. Venkateswarlu ; 1 ♂ Mithapur, 4.5.1968, coll. K. K. Mahajan ; 1 ♂ Nand Ghat (Naubatpur), 17.6.1968, coll. D. P. Sanyal ; 3 ♂♂ Maner, 16.9.1969, coll. R. K. Varshney ; 1 ♂ Khagaul, 18.3.1970, coll. T. Venkateswarlu ; 1 ♀ Neterhat, 12.2.1971, coll. B. Nath ; 1 ♂ Maner, 21.9.1972, coll. R. K. Varshney ; 7 ♂♂ Maner, 22.10.1973, coll. B. Nath and 1 ♂ Namkum, 9.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	20.00 mm	24.00 mm	23.00-23.50 mm
Female :	19.50 mm	25.50 mm	24.00 mm

Distribution : India [H. P. : Bilaspur, Kangra, Sirmaur, Una, U. P : Dehra Dun, Nainital, Parui Garhwal, Madhya Pradesh, Bihar (Dhanbad), West Bengal and East Himalaya], Nepal ; Burma ; Sri Lanka ; Thailand ; Singapore ; Malaya ; Taiwan ; Philippines ; Indonesia (Java, Sumatra) and China.

Remarks : It is most common species of India and found in large numbers. It is seen flying over water surface throughout the year. It is a multivoltine species and completes three generations in a year.

Subfamily : TRITHEMISTINAE

Genus *Trithemis* Brauer54. *Trithemis aurora* (Burmeister)

1839. *Libellula aurora* Burmeister, *Handb. Ent.* 2 : 859.

1936. *Trithemis aurora*, Fraser, *Fauna Brit. India*, 3 : 383-385.

Material examined : 1 ♂ Hazaribagh, 13.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	23.50 mm	26.00 mm	26.00 mm

Distribution : Throughout India (Bilaspur, Hamirpur, Kangra, Dehra Dun, Nainital, Pauri and Tehri Garhwal), Pakistan ; Nepal ; Sri Lanka ; Burma ; W. Malaysia (Penang) ; Indonesia (Borneo, Sulawesi, Java, Moluccas, Sumba, Sumatra, Timor) and Philippines.

55. *Trithemis festiva* (Rambur)

1842. *Libellula festiva* Rambur, *Ins. Neurop.*, : 92.

1936. *Trithemis festiva*, Fraser, *Fauna Brit. India*, 3 : 387-389.

Material examined : 1 ♂ Bishupur, 5.3.1983, coll. M. Prasad.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male ;	24.50 mm	28.50 mm	28.00 mm

Distribution : India (H. P. : Bilaspur, Hamirpur, Kangra, Sirmaur, Solan, U. P. : Chamoli, Dehra Dun, Nainital, Pauri and Tehri Garhwal, Uttar Kashi, West Bengal, Assam and Maharashtra), Nepal ; Sri Lanka ; Burma ; W. Malaysia (Penang) ; Singapore ; Indonesia (Sulawesi, Java, Lesser Sunda, Sumatra) ; Philippines ; Taiwan and Papua (New Guinea).

Remarks : It is a common species near hill streams. Adults breed in still waters or streams with sluggish current.

56. *Trithemis pallidinervis* (Kirby)

1889. *Sympetrum pallidinervis* Kirby, *Trans. Zool. Soc. Lond.*, : 327.

1936. *Trithemis pallidinervis*, Fraser, *Fauna Brit. India*, 3 : 389-391.

Material examined : 1 ♀ Mithapur, 5.9.1967, coll. *M. Guha* ; 1 ♂ Upper Ghagri, Netarhat, 6.3.1983 ; 1 ♂ Hundru falls Ranchi, 11.3.1983, coll. *M. Prasad* ; 3 ♂ ♂ Bhojpur, 17.7.1984 ; 5 ♀ ♀ Bahadurganj, 18.7.1984, coll. *Y P. Sinha* and 1 ♀ Bhagwanpur (Garol), 9.8.1984, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	26.00 mm	33.00 mm	32.50 mm
Female :	25.00 mm	32.00 mm	31.00 mm

Distribution : Throughout India except in desert areas [Kangra, Dehra Dun, Nainital, Pauri Garhwal, Bihar (Pusa, Dhanbad), West Bengal, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra), Nepal ; Burma ; Sri Lanka ; Philippines ; Taiwan ; Thailand ; Malaysia and Singapore.

Remarks : It is the most common species of this genus and is found near water bodies.

Subfamily : TRAMEINAE

Genus *Tholymis* Hagen

57. *Tholymis tillarga* (Fabricius)

1798. *Libellula tillarga* Fabricius, *Ent. syst. suppl.*, : 285.

1936. *Tholymis tillarga*, Fraser, *Fauna Brit. India*, 3 : 411-413.

Material examined : 1 ♂ Patna, 22.5.1967, coll. *G. Ganguly* ; 1 ♂

Mithapur, 5.9.1967, coll. *M. Guha* ; 1 ♀ Khargolia 8.8.1984, and 1 ♀ Jatkaulia (Garol), 9.8.1987, coll. *Y. Chaturvedi*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	30.50 mm	35.00 mm	34.00 mm
Female :	31.00 mm	35.00 mm	34.00 mm

Distribution : Throughout India ; Burma ; Sri Lanka ; Thailand ; W. Malaysia (Penang) ; Indonesia (Java, Bali, Borneo, Lombok, Sumba) ; Micronesia ; Australia and Tropical Africa.

Remarks : Nodal index varies from $\frac{7-10}{9-7} \frac{1}{1} \frac{10-7}{7-9}$ to $\frac{7-10}{9-7} \frac{1}{1} \frac{11-7}{8-10}$.

Genus *Rhythemis* Hagen

58. *Rhythemis variegata variegata* (Linnaeus)

1768. *Libellula variegata* Linnaeus, *Amoenitates Acad.*, 6 : 412.

1936. *Rhythemis variegata*, Fraser, *Fauna Brit. India*, 3 : 423-424.

Material examined : 1 ♂ Patna 22.5.67, coll. *G. Ganguly* ; 1 ♀ Patna, 17.10.1968, coll. *D. P. Sanyal* ; 1 ♀ Pareb (Koilwar), 16.9.1969 and 1 ♂ 1 ♀ Jogipur, 17.4.1970, coll. *R. K. Varshney*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	24.00 mm	33.00 mm	32.00 mm
Female :	22.00 mm	32.00 mm	31.50 mm

Distribution : India [H. P. : Kangra, U. P. : Dehra Dun, Bihar (Dhanbad), West Bengal and Karnataka] ; Nepal ; Burma ; Sri Lanka and Malaysia.

Genus *Pantala* Hagen

59. *Pantala flavescens* (Fabricius)

1898. *Libellula flavescens* Fabricius, *Ent. Syst. Suppl.*, : 285.

1936. *Pantala flavescens*, Fraser, *Fauna Brit. India*, 3 : 414-416.

Material examined : 2 ♀ ♀ Bihta, 3.8.1967, coll. *T. Venkateswarlu* ; 2 ♂ ♂ 2 ♀ ♀ Mithapur, 22.8.1967, coll. *K. K. Mahajan* ; 2 ♀ ♀ Daniawa (Fatuha), 23.8.1967 ; 1 ♂ Daniawa (Fatuha), 15.5.1968, coll. *T. Venkateswarlu* ; 1 ♀ Baikathpur, 14.8.1968, coll. *D. P. Sanyal* ; 2 ♂ ♂

Phulwari sarif, 24.8.1968 ; 1 ♂ Patna, 30.8.1968, coll. *S. P. Prasad* ; 1 ♀ Harding Park, 6.9.1968, coll. *B. Nandi* ; 1 ♂ Mahendrughat, 6.10.1969, coll. *B. Nandi* ; 1 ♂ Chhatarpur, dakbunglow, 2.2.1971, coll. *T. Venkateswarlu* ; 2 ♀ ♀ Kutku, 4.2.1971, coll. *B. Nath* ; 1 ♀ Bishnupur, 5.3.1983, coll. *M. Prasad* ; 1 ♂ Ghatro (Lalganj), 7.8.1984 ; 1 ♂ Mansurpur, 8.8.1984 ; 4 ♀ ♀ Khargolia, 8.8.1984 ; 1 ♀ Manpura, Belasar, 9.8.1984, coll. *Y. Chaturvedi* and 1 ♂ Kulharia, 25.9.1984, coll. *Y. P. Sinha*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	30.50-33.00 mm	42.00 mm	40.50-41.00 mm
Female :	33.00 mm	42.50 mm	40.50 mm

Distribution : Circumtropical and subtropical in distribution : Throughout India ; Morocco (N. W. Africa) ; Nepal ; Burma ; Sri Lanka ; Micronesia ; Thailand ; W. Malaysia (Penang) ; Indonesia (Sumatra, Java, Bali and Borneo) and China.

Remarks : Only one row of cells present in between IRiii & RSPL in forewing and two rows in hindwing. Discoidal cell in forewing traversed only once. Nodal index varies from $\frac{7-12\frac{1}{2} | 13\frac{1}{2}-7}{9-7 | 7-9}$ to $\frac{7-12\frac{1}{2} | 13\frac{1}{2}-7}{9-7 | 7-9}$.

Genus *Tramea* Hagen60. *Tramea basilaris burmeisteri* Kirby

(Figs. 5 & 6)

1839. *Libellula chinensis* Brumeister, *Handb. Ent.*, 2 : 852.1889. *Tramea burmeisteri* Kirby, *Trans. Zool. Soc. Lond.*, : 316.1936. *Tramea basilaris burmeisteri*, Fraser, *Fauna Brit. India*, 3 : 432-443.

Material examined : 1 ♂ 1 ♀ Kankarbagh, 28.10.1967, coll. *R. N. Varma*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	32.00 mm	42.50 mm	40.00 mm
Female :	—	45.00 mm	44.00 mm

Distribution : India [H. P. : Kangra, U. P. : Dehra Dun, Bihar (Dhanbad), Madhya Pradesh, West Bengal, Tamil Nadu and Karnataka] and Malaysia.

Remarks : Discoidal cell in forewing traversed only once, while in hindwing entire ; discoidal field begins with 2 rows of cells. Nodal index varies from $\frac{9-13\frac{1}{2} | 10\frac{1}{2}-9}{11-6 | 6-11}$ to $\frac{10-11\frac{1}{2} | 12\frac{1}{2}-9}{12-7 | 7-12}$.

61. *Tramea virginia* (Rambur)

1773. *Libellula chinensis* De Geer, *Mem. Ins.*, 3 : 556.

1842. *Libellula virginia* Rambur, *Ins. Neurop.*, : 33.

1936. *Tramea virginia*, Fraser, *Fauna Brit. India*, 3 : 435-436.

Material examined : 1 ♂ Rajgir, 15.11.1975, coll. L. Ram.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	33.00 mm	46.00 mm	44.00 mm

Distribution : India (Kangra and Dehra Dun), Burma ; Taiwan ; Thailand ; Micronesia (Carolina Island) ; Indonesia (Borneo) ; China and South Japan.

Remarks : Reddish-brown fascia present at the base of hindwing extended upto 1st antenodal nervure. It does not extend upto discoidal field as described by Fraser (1936).

This species is recorded here for the first time from Bihar.

Subfamily : UROTHEMISTINAE

Genus *Urothemis* Brauer

62. *Urothemis signata signata* (Rambur)

1839. *Libellula sanguinea* Burmeister, *Handb. Ent.*, 2 : 858.

1842. *Libellula signata* Rambur, *Ins. Neurop.*, : 117.

1936. *Urothemis signata signata*, Fraser, *Fauna Brit. India*, 3 : 442-444.

Material examined : 1 ♀ Bangla Bageecha, 12.10.1966, coll. S. P. Prasad ; 1 ♂ 1 ♀ Patna, 22.5.1967, coll. G. Ganguly ; 1 ♀ Maner, 3.8.1967, coll. T. Venkateswarlu ; 1 ♀ Kankarbagh, 28.10.1967, coll. R. N. Verma ; 1 ♂ Begampur, 22.11.1968, coll. D. P. Sanyal ; 1 ♀ Rajghat, Nawada, 29.7.1969, coll. R. K. Varshney ; 1 ♀ Rampur,

21.10.1971, coll. *B. Nandi* and 1 ♂ Rajendra Nagar, Patna, 1.8.1974, coll. *S. C. Nahar*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Male :	28.00-28.50 mm	38.00-39.00 mm	37.00-38.00 mm
Female :	27.00-28.00 mm	38.00-39.00 mm	36.00-37.00 mm

Distribution : India [Uttar Pradesh, Bihar (Dhanbad), West Bengal, Coorg, South Malabar, Bombay and Madras], Burma ; Sri Lanka ; Malaysia and China.

Remarks : Nodal index varies from $\frac{7-7}{7-5} \mid \frac{7-7}{5-7}$ to $\frac{8-7}{7-5} \mid \frac{7-7}{5-8}$.

Genus *Aethriamanta* Kirby

63. *Aethriamanta brevipennis brevipennis* (Rambur)

1842. *Libellula brevipennis* Rambur, *Ins. Neurop.*, : 114.

1936. *Aethriamanta brevipennis brevipennis*, Fraser, *Fauna Brit. India*, 3 : 445-447.

Material examined : 1 ♀ Jogipur, 9.7.1978, coll. *S. P. Prasad*.

Measurements :

	<i>Abdomen</i>	<i>Forewing</i>	<i>Hindwing</i>
Female :	18.00 mm	28.00 mm	27.00 mm

Distribution : India (West Bengal, Assam, Coorg and Malabar), Sri Lanka and Burma.

Remarks : This species is recorded here for the first time from Bihar.

KEY TO SPECIES AND SUBSPECIES IN BIHAR

(Based on adult specimens)

- | | | | |
|--|-----|-----|----|
| 1. Eyes well separated ; forewing and hindwing more or less similar in shape and breadth ; wings petiolate | ... | ... | 2 |
| — Eyes not well separated, meeting only at a point or broadly confluent ; forewing and hindwing not similar in shape and breadth ; wings never petiolate | ... | ... | 27 |

2. More than 5 antenodal nervures ; arc nearer to the base of the wing than the node ; anal vein separate from posterior border of wing	...	26
— Only 2 (rarely 3) antenodal nervures ; arc midway between base of wing and node or nearer to node than the base ; anal vein fused at base with the posterior border of wing	...	3
3. Veins IRiii+V arising nearer to the node than the arculus	...	4
— Veins IRiii+V arising nearer to the arculus than the node	...	22
4. Discoidal cell short ; anal vein separating from wing border either proximal to AC or distal to AC ; MA and IRiii zigzagged for greater part of their length	...	5
— Discoidal cell elongate ; anal vein separating from wing border proximal to AC ; MA and IRiii mostly straight only zigzagged apically or not at all ; legs bright orange to dull reddish in colour	...	<i>Copera marginipes</i> (Rambur)
5. Arc situated at the level of the distal antenodal nervure	...	6
— Arc situated distal to the level of the distal antenodal nervure	...	(<i>Agriocnemis</i> Selys) 20
6. Vein ab arising from the hind border of the wing at the point where ac meets it	...	7
— Vein ab arising from the hind border of the wing more or less proximal to the point where ac meets it	...	14
7. A prominent ridge on the frons present ; no postocular coloured spot on the head ; head and thorax uniform colour	...	(<i>Ceriagrion</i> Selys) 8
— No ridge on the frons ; postocular coloured spots always present ; head and thorax not of uniform colour	...	9
8. Abdomen bright red at base	...	<i>C. cerinorubellum</i> (Brauer)
— Abdomen not bright red at base, but uniform citron yellow	...	<i>C. coromandelianum</i> (Fabr.)
9. Pterostigma in forewing and hindwing of the same size ; abdomen not unduly long and slender	...	(<i>Pseudagrion</i> Selys) 10

— Pterostigma in forewing longer than in the hindwing ; abdomen usually very long and slender	...	<i>Aciagrion pallidum</i> (Selys)	
10. Face, frons, vertex and occiput blue or green, marked with black	...	...	11
— Face, frons, vertex and occiput may be bright reddish orange, dark ochreous or mainly black	...	...	13
11. Thorax pale-blue on dorsal side, with three fine black lines on mid-dorsal carinal ridge and a thicker black humeral stripe	...	<i>P. decorum</i> (Ramb.)	
— Thorax sky blue or green on dorsal side with medial and humeral black stripes	...	...	12
12. Superior anal appendages shorter than segment 10, not bifid at the apex as seen in profile	...	<i>P. malabaricum</i> Fraser	
— Superior anal appendages as long as segment 10, and bifid at the apex as seen in profile ; a long robust spine near the base present	...	<i>P. spencei</i> Fraser	
13. Thorax golden-green on dorsum, sky blue on sides and without pruinescence	...	<i>P. rubriceps</i> Selys	
— Thorax black on dorsum, purple-brown on sides and obscured by pruinescence	...	<i>P. hypermelas</i> Selys	
14. Pterostigma of the same colour and shape in forewing and hindwing of male ; dorsal apical tubercle on segment 10 of male absent	...	...	18
— Pterostigma differing in shape and size in forewing and hindwing of male ; dorsal apical tubercle on segment 10 of male present	...	...	15
15. Postocular coloured spot always present in adult stage ; tubercles on apical border of segment 10 closely opposed	...	<i>(Ischnura</i> Charp.)	16
— Postocular coloured spot absent in the adult stage ; tubercles on apical border of segment 10 widely separated by a shallow notch	...	<i>Rhodischnura nursei</i> (Morton)	
16. Body colour of male bright orange-red ; abdominal segments 8-10 only black	...	<i>I. rufostigma</i> Selys	
— Body colour of male and Isochrome female blue or pale grass-green	...	...	17
17. Abdominal segments 3—6 lemon-colour on dorsal side ; segment 2 not steely metallic blue on dorsal side	...	<i>I. aurora</i> (Brauer)	

— Abdominal segments 3—6 black on dorsal side ; segment 2 steely metallic blue on dorsal side	...	<i>I. senegalensis</i> (Rambur)	
18. Female with a robust ventral apical spine on segment 8	...	<i>Enallagma parvum</i> Selys	
— Female without a ventral apical spine on segment 8	...	...	19
19. Tarsal claw-hook of equal length ; postocular coloured spots absent	...	<i>Onychargia atrocyana</i> (Selys)	
— Tarsal claw-hooks unequal in length ; postocular coloured spots present ; only 8 to 10 postnodal nervures in forewing	...	<i>Coenagrion dyeri</i> (Fraser)	
20. Labrum non-metallic	...	...	21
— Labrum metallic-blue	...	<i>Agriocnemis pygmaea</i> (Rambur)	
21. Abdomen white in colour	...	<i>Agriocnemis lacteola</i> Selys	
— Abdomen with heavy black markings	...	<i>Agriocnemis splendidissima</i> Laidlaw	
22. Thorax without metallic markings	...	...	23
— Thorax with green metallic antehumeral stripes	...	...	25
23. Pterostigma unicoloured	...	...	24
— Pterostigma bicoloured ; thorax immaculate	...	<i>Lestes nodalis</i> Selys	
24. Vertex of head pale brown	...	<i>Lestes umbrina</i> Selys	
— Vertex of head mat-black	...	<i>Lestes thoracica</i> Laidlaw	
25. Dorsum of the thorax with two very narrow conspicuous metallic green stripes ; pterostigma narrow and smaller in size	...	<i>Lestes viridula</i> Rambur	
— Dorsum of the thorax with two very narrow conspicuous metallic green stripes ; pterostigma longer in size	...	<i>Lestes nigriceps</i> Fraser	
26. Arc angulated ; basal space traversed or entire ; sectors of arc separated at origin ; main sectors not forked ; forewings of both sexes hyaline	...	<i>Neurobasis chinensis chinensis</i> (Linn.)	
— Arc oblique, not angulated ; basal space entire ; sectors of arc arising from a single point ; main sectors forked ; pterostigma absent	...	<i>Vestalis gracilis gracilis</i> (Rambur)	

- | | |
|--|---|
| <p>27. Discoidal cell approximately of the same size and shape in forewing and situated equally distant from the arc ; costal and subcostal antenodal nervures not coinciding with the two robust primary antenodals ; middle lobe of the labium large and fissured ...</p> <p>— Discoidal cell differing in size and shape in forewing and hindwing, that of forewing situated far distal of the arc ; middle lobe of labium very small, not fissured, broadly overlapped by the lateral lobes ; costal and subcostal antenodal nervure coinciding the robust primary antenodals absent ...</p> | <p>... 28</p> <p>... 36</p> |
| <p>28. Eyes broadly confluent above ...</p> <p>— Eyes separated ; ovipositor absent ...</p> | <p>... 33</p> <p>... 29</p> |
| <p>29. Discoidal cell, hypertrigone, and subtrigone of forewing traversed and reticulated ...</p> <p>— Discoidal cell, hypertrigone, and subtrigone of forewing always entire ...</p> | <p><i>Ictinogomphus rapax</i> (Rambur)</p> <p>... 30</p> |
| <p>30. Hindwing not excavated at base, with tornus rounded in the male ...</p> <p>— Hindwing more or less excavated at base, with tornus more or less angulated ...</p> | <p><i>Anormogomphus heteropterus</i> (Selys)</p> <p>... 31</p> |
| <p>31. Anal loop absent ; first postnodal cell not extending proximal to the base of subtrigone in hindwing ; anal triangle nearly always 3-celled ; abdominal segments 8—9 greatly dilated laterally ...</p> <p>— Anal loop present, although often rudimentary ; first postanal cell extending more or less proximal to base of subtrigone in hindwing ; anal triangle nearly always 4 celled ...</p> | <p><i>Platygomphus dolabratus</i> (Selys)</p> <p>... 32</p> |
| <p>32. Anal triangle 3-celled ; only two rows of cells between IA and margin of forewing ; lobe of penis swollen and markedly vesiculate ...</p> <p>— Anal triangle 4-celled ; three or more rows of cells between IA and margin of forewing, lobe of penis not vesiculate ; superior anal appendages much straight and curled only at apices ...</p> | <p><i>Nepogomphus modestus</i> (Selys)</p> <p><i>Onychogomphus grammicus</i> (Rambur)</p> |

33. Base of hindwing without a notch ; tornus (postero-basal angle) of hindwing rounded in both sexes ; anal triangle absent ; only 2 rows of cells between the origin of cuii and IA veins of hindwing	...	<i>Anax gattatus</i> (Burmeister)	
— Base of hind wing more or less deeply notched ; tornus of hindwing angulated in the male ; anal triangle always present ; one row of cells between the origin of cuii and 1A veins in hindwing	...	(<i>Gynacantha</i> Ramb.)	34
34. Upper surface of frons marked with a thick black T marking	...	...	35
— Upper surface of frons unmarked or with only a blackish bordering ; abdominal segments without black or other bright sharply defined markings	...	<i>Gynacantha albistyla</i> Fraser	
35. Inferior anal appendages less than one-third the length of superior ; wings not tinted with amber at bases	...	<i>Gynacantha biharica</i> Fraser	
— Inferior anal appendages more than one-third the length of superiors ; abdominal segments 3 to 8 with a dark brown oblique fascia extending from the apical border to jugum and paling from apex to base	...	<i>Gynacantha hyalina</i> Selys	
36. Sectors of arc separated from origin ; feebly developed primary antenodal nervure present	...	...	37
— Sectors of arc fused at their origin, primary antenodal nervure absent	...	...	38
37. Subtrigone in forewing entire ; small size specimens	...	<i>Aethriamanta brevipennis</i> <i>brevipennis</i> (Rambur)	
— Subtrigone in forewing 3 celled ; large size specimens	...	<i>Urothemis signata signata</i> (Rambur)	
38. Apex of loop in the wings open ; an opalescent white spot in the middle of the hindwing present	...	<i>Tholymis tillarga</i> (Fabr.)	
— Apex of loop in the wings closed ; an opalescent white spot in middle of the hindwing absent	...	...	39
39. Distal antenodal nervure in forewing complete	...	...	40

— Distal antenodal nervure in forewing incomplete	...	...	47
40. Frons metallic above	...	<i>Brachydiplax sobrina</i> (Rambur)	
— Frons not metallic above	...	...	41
41. Small size specimens ; only 6 antenodal nervures in forewing	...	<i>Acisoma panorpoides panorpoides</i> Rambur	
— Medium size specimens, not less than 12 antenodal nervures in forewing	...	(<i>Orthetrum</i> Newman)	42
42. Males coloured brown or black with yellow markings ; often pruinosed	...	...	43
— Males coloured some shade of red, or violaceous red due to a thin overlying pruinescens ; frons blue black anteriorly	...	<i>Orthetrum pruinoseum neglectum</i> (Rambur)	
43. Abdomen variable but never very slim nor compressed laterally ; mostly with pruinosed abdomen and thorax	...	...	44
— Abdomen enormously swollen at base and then abruptly slimmed and compressed laterally to the end ; black marked with greenish-yellow ; never pruinosed	...	<i>Orthetrum sabina</i> (Drury)	
44. Base of hindwing with a large black triangular marking ; discoidal field in the forewing begins with four rows of cells	...	<i>Orthetrum chandrabali</i> Mehrotra	
— Base of hindwing without a large black triangular marking	...	...	45
45. Base of hindwing amber yellow at extreme base ; discoidal field in the forewing begins with three rows of cells	...	<i>Orthetrum ganeshi</i> Mehrotra	
— Base of hindwing without amber yellow marking	...	...	46
46. Moderately large specimens with face dark-brown ; membrane pure white	...	<i>Orthetrum brunneum brunneum</i> (Fons.)	
— Smallest species of the genus ; with face and frons greyish green or bluish ; membrane dark-brown bordered with black	...	<i>Orthetrum taeniolatum</i> (Schn.)	
47. Lobes of prothorax with long hairs	...	...	48
— Lobes of prothorax without long hairs	...	...	50

48. Eyes contiguous for a short space ; discoidal cell in hindwing entire, costal border of forewing straight ; frons non-metallic above ; discoidal field in forewing beginning with at least 3 rows of cells ... *(Diplacodes Kirby)* 49
- Eyes more broadly contiguous, discoidal cell in hindwing traversed ; costal border of forewing sinuous near base ; frons metallic above ; discoidal field in forewing beginning with 3 rows of cells ... *Palpopleura sexmaculata sexmaculata* (Fabr.)
49. Apices of forewing and hindwing tipped with black ... *Diplacodes nebulosa* (Fabr.)
- Apices of forewing and hindwing not tipped with black ; anal appendages yellow ... *Diplacodes trivialis* (Rambur)
50. Sectors of arc in forewing separated and divergent at the origin ; black and golden yellow markings present on the wings ... *Rhyothemis variegata variegata* (Linn.)
- Sectors of arc in forewing arising from common long stalk ; black and golden yellow markings on the wings absent ... 51
51. Discoidal field converging at wing border ... 52
- Discoidal field parallel or divergent at wing border ... 55
52. Nervure IRiii present in between Rii and Riii *Pantala flavescens* (Fabr.)
- Nervure IRiii absent in between Rü and Riii... *(Trithemis Brauer)* 53
53. Legs very long and spidery ; pterostigma bicoloured ; body yellow marked with black *Trithemis pallidinervis* (Kirby)
- Legs of ordinary length ; pterostigma unicoloured ; body colour variable ... 54
54. Thorax and abdomen violaceous-black ; base of hindwing with a small dark brown spot ; neuration black ... *Trithemis festiva* (Rambur)
- Thorax and abdomen violaceous-crimson ; base of hindwing with small reddish-brown spot ; neuration crimson ... *Trithemis aurora* (Burm.)
55. Pterostigma unequal in forewing and hindwing ; large blackish-brown spot present at the base of wings ... *(Tramea Hagen)* 56.
- Pterostigma equal in size in forewing and hindwing ... 57

56. Hamule with slightly overlapping lobe ; two large black spots at the hindwing surrounded by a golden yellow areola, one in cubital space, the other lying obliquely in anal area of wing ; the two narrowly confluent near base of discoidal cell in the male ... *Tramea basilaris burmeisteri*
Kirby
- Hamule much longer and with greatly overlapping lobe ; only a single black spot of variable size at the base of hindwing ; spot in hindwing reddish-brown, very large, extending distally to distal end of discoidal cell and involving nearly whole of anal loop ... *Tramea virginia* (Ramb.)
57. Pterostigma bicoloured (Black with white end) ... *Bradinopyga geminata* (Rambur)
- Pterostigma unicoloured ... 58
58. More than one cubital nervure present in all wings ... (*Neurothemis* Brauer) 59
- Only one cubital nervure present in all wings ... 61
59. An opalescent white band in the wings absent ... 60
- An opalescent white band in the wings present ; base of wings broadly black ... *Neurothemis tullia tullia* (Drury)
60. Wings dark reddish brown from base to about middle of pterostigma ; apex of wings also narrowly opaque brown to partly enclose a clear window in each wing at apex, neuration close ... *Neurothemis fulvia* (Drury)
- Wings pale yellow, area at the base not very sharply defined ; costal border of wings pale yellow up to as far as pterostigma ; reticulation open ... *Neurothemis intermedia intermedia* (Ramb.)
61. Red or pale yellow specimens ; basal or medial yellow marking present on wings ... 62
- Variable coloured specimens ; base of wings rarely marked with pale yellow ; 2 rows of cells present in between IRiii and RSpI ... *Potamarcha congener* (Rambur)
62. Broad reddish yellow medial marking present on the wings ... *Brachythemis contaminata* (Fabr.)
- Small basal yellow marking present at the base of the wings ... *Crocothemis servilia servilia* (Drury)

ZOOGEOGRAPHY

The generic distribution and zoogeography of Odonata of Bihar is given in Tables I & II. A total of 36 genera (12 Zygoptera and 24 Anisoptera) are recorded. Out of these, 4 species of 3 genera viz., *Lestes* Leech, *Gynacantha* Rambur and *Orthetrum* Newman, are endemic

TABLE I
Zoogeographical Classification of the Odonata Genera
present in Bihar

Genera	Family						
		ORIENTAL	PALEARCTIC	TROPICAL	ETHIOPIAN	AUSTRALIAN	COSMOPOLITON
1. <i>Copera</i> Kirby	Platycnemididae	+	-	-	-	-	-
2. <i>Pseudagrion</i> Selys	Coenagrionidae	-	-	+	-	-	-
3. <i>Ceriagrion</i> Selys	„	-	-	+	-	-	-
4. <i>Coenagrion</i> Kirby	„	-	+	-	-	-	-
5. <i>Ischnura</i> Charp.	„	-	-	-	-	+	-
6. <i>Aciagrion</i> Selys	„	-	-	+	-	-	-
7. <i>Rhodischnura</i> Laidlaw	„	+	-	-	-	-	-
8. <i>Enallagma</i> Charp.	„	-	-	-	-	-	+
9. <i>Agriocnemis</i> Selys	„	-	-	+	-	-	-
10. <i>Onychargia</i> Selys	„	+	-	-	-	-	-
11. <i>Lestes</i> Leach	Lestidae	-	-	-	-	-	+
12. <i>Neurobasis</i> Selys	Calopteryxidae	+	-	-	-	-	-
13. <i>Onychogomphus</i> Selys	Gomphidae	+	-	-	-	-	-
14. <i>Nepogomphus</i> Fraser	„	+	-	-	-	-	-
15. <i>Anarmogomphus</i> Selys	„	+	-	-	-	-	-
16. <i>Platygomphus</i> Laidlaw	„	+	-	-	-	-	-
17. <i>Ictinogomphus</i> Cowley	„	-	-	-	+	-	-

Genera		Family						
			ORIENTAL	PALEARCTIC	TROPICAL	ETHIOPIAN	AUSTRALIAN	COSMOPOLITON
18.	<i>Gynacantha</i> Rambur	Aeshnidae	-	-	-	-	-	+
19.	<i>Anax</i> Leach	„	-	-	+	-	-	-
20.	<i>Potamarcha</i> Karsch	Libellulidae	+	-	-	-	-	-
21.	<i>Orthetrum</i> Newman	„	-	-	+	-	-	-
22.	<i>Brachydiplax</i> Brauer	„	+	-	-	-	-	-
23.	<i>Palpopleura</i> Rambur	„	+	-	-	-	-	-
24.	<i>Acisoma</i> Rambur	„	+	-	-	-	-	-
25.	<i>Diplacodes</i> Kirby	„	-	-	+	-	-	-
26.	<i>Crocothemis</i> Brauer	„	-	-	-	-	+	-
27.	<i>Bradinopyga</i> Kirby	„	-	-	-	+	-	-
28.	<i>Brachythemis</i> Brauer	„	-	-	-	+	-	-
29.	<i>Neurothemis</i> Brauer	„	+	-	-	-	-	-
30.	<i>Trithemis</i> Brauer	„	+	-	-	-	-	-
31.	<i>Rhyothemis</i> Hagen	„	+	-	-	-	-	-
32.	<i>Tholymis</i> Hagen	„	-	-	-	-	+	-
33.	<i>Pantala</i> Hagen	„	-	-	-	-	-	+
34.	<i>Tramea</i> Hagen	„	-	-	-	-	-	+
35.	<i>Urothemis</i> Brauer	„	+	-	-	-	-	-
36.	<i>Aethriamanta</i> Kirby	„	+	-	-	-	-	-

to Bihar. Other species represent : 17 Oriental, one Palearctic, 7 Tropical (old world), 3 Ethiopian, 3 Australian and 5 Cosmopolitan in distribution. The study comprises 26 species of Zygoptera (41%) and 37 species of Anisoptera (59%). Among 63 species of Odonata, are: 55 Oriental (87.3%), 4 Palearctic (6.3%), 3 Ethiopian (4.8%) and one Circumtropical (1.6%). Out of 26 Zygoptera, 23 are Oriental (88.4%), 2 Palearctic (7.6%) and one Ethiopian (4%) ; while out of 37 Anisoptera, 32 are Oriental (86.7%), 2 Palearctic (5.4%), 2 Ethiopian (5.4%) and one Circumtropical (2.5%).

Oriental Element (55 species) : It consists of species distributed in Indian Sub-continent (other than Palearctic which are found in North-West Palearctic region and restricted upto Kashmir Valley only), and extends their distribution to South-Eastwards across to Indo-China—Malaysian and Indonesian regions. Some species are found in Australian region also. This element forms the major fauna of Odonata found in Bihar. On the basis of their distribution these species are further divided into the following sub-regions :

(i) *Indian Element (27 species)* : Species of this element are known from India, Pakistan, Bangladesh, Nepal and Sri Lanka and extend across Burma, Thailand, Laos and Vietnam. It comprises 16 species of Zygoptera (61.5%) and 11 species of Anisoptera (29.8%), and it is presumed that due to the weak-flying capability the Zygoptera are dominant over Anisoptera. These Zygoptera are restricted to their larval habitats.

(ii) *Indo-Malaysian Element (17 species)* : Species of this element are distributed in Indian—Indo-Chinese and Malaysian—Indonesian areas upto Philippines and Taiwan in east. It includes 17 species, 4 Zygoptera (15.3%) and 13 Anisoptera (35.1%). As a whole it forms about 28.7% of total Odonata known from Bihar. In this element, Anisoptera is dominating over Zygopteran element, which is perhaps due to their strong flying capacity. Out of these 17 species, 14 species are occurring in Nepal and Sri Lanka also.

(iii) *Indo-Malaysian, extending into Australian Element (7 species)* :

Species of this element extend their distribution further South East beyond the Oriental region into New-Guinea, Sunda Islands, Micronesia and upto the continent of Australia. These species are present both in the Oriental as well as in Australian regions. They are chiefly distributed in Oriental (Indo-Malaysian) region. Therefore, they have been included here within the Oriental element. It comprises 7 species, 2 Zygoptera (7.6%) and 5 Anisoptera (13.5%), and form 11% of total Odonata fauna of Bihar. Most of these species are widely distributed in Bihar.

(iv) *Endemic Element (4 species)* : It includes only 4 species : one Zygoptera (4%) and 3 Anisoptera (8.1%) ; which are known from Bihar only. Almost all of these species are known from their original type localities only in Bihar. It is a sub-unit of Oriental fauna.

Palaearctic Element (4 species) : This element which is generally absent in our region, is marginally recorded from Bihar. In this element only 4 species are included : 2 Zygoptera (7.6%) and 2 Anisoptera (5.4%) ; and on the whole it forms 6.3% of total Odonata known from Bihar.

Ethiopian Element (3 species) : Species of this element are commonly distributed in tropical Africa. Only 3 species ; One Zygoptera (4%) and two Anisoptera (5.4%), viz., *Ischnura senegalensis* (Rambur), *Orthetrum taeniolatum* (Schneider) and *O. sabina* (Drury), are known from Bihar. These species are very common throughout India.

Circumtropical Element (one species) : Species of this element are distributed in Oriental region, Ethiopian region, Tropical America, Neotropics and Pacific Islands. One species, viz., *Pantala flavescens* (Fabr.) occurring in Bihar, is circumtropical in distribution. This species is common throughout the year in different parts of India.

TABLE II

Composition of Faunal elements in Zygoptera and Anisoptera of Bihar

Faunal elements	Zygoptera (Number of species)	%	Anisoptera (Number of species)	%
1. ORIENTAL				
(i) Indian	16	61.5	11	29.8
(ii) Indo-Malaysian	4	15.3	13	35.1
(iii) Indo-Malaysian extending into Australian Region	2	7.6	5	13.5
(iv) Endemic (Bihar)	1	4	3	8.1
—88.4 —86.5				
2. PALEARCTIC	2	7.6	2	5.4
3. ETHIOPIAN	1	4	2	5.4
4. CIRCUMTROPICAL	—	—	1	2.7
TOTAL	26	100	37	100
% in total Odonata fauna	41%		59%	

SUMMARY

Sixty-three species of Odonata (26 Zygoptera and 37 Anisoptera) from Bihar are reported. Out of these 13 species are recorded for the first time from Bihar. Some field notes and variations from the published descriptions are mentioned. Distribution in India, as well as the total geographical range of a species are given. A key to the species and subspecies (based on adults) in Bihar is also provided. The zoogeography has been discussed for the first time, which shows that the studied material represents Oriental (55 species), Palearctic (4 species), Ethiopian (3 species) and Circumtropical (1 species) elements.

ACKNOWLEDGEMENTS

Authors are thankful to the Director, Zoological Survey of India, Calcutta, for providing facilities and permission to undertake this study. Thanks are also due to Shri Ram Babu Sharma, Photographer, Gangetic Plains Regional Station, Zoological Survey of India, Patna, for the preparation of photographs.

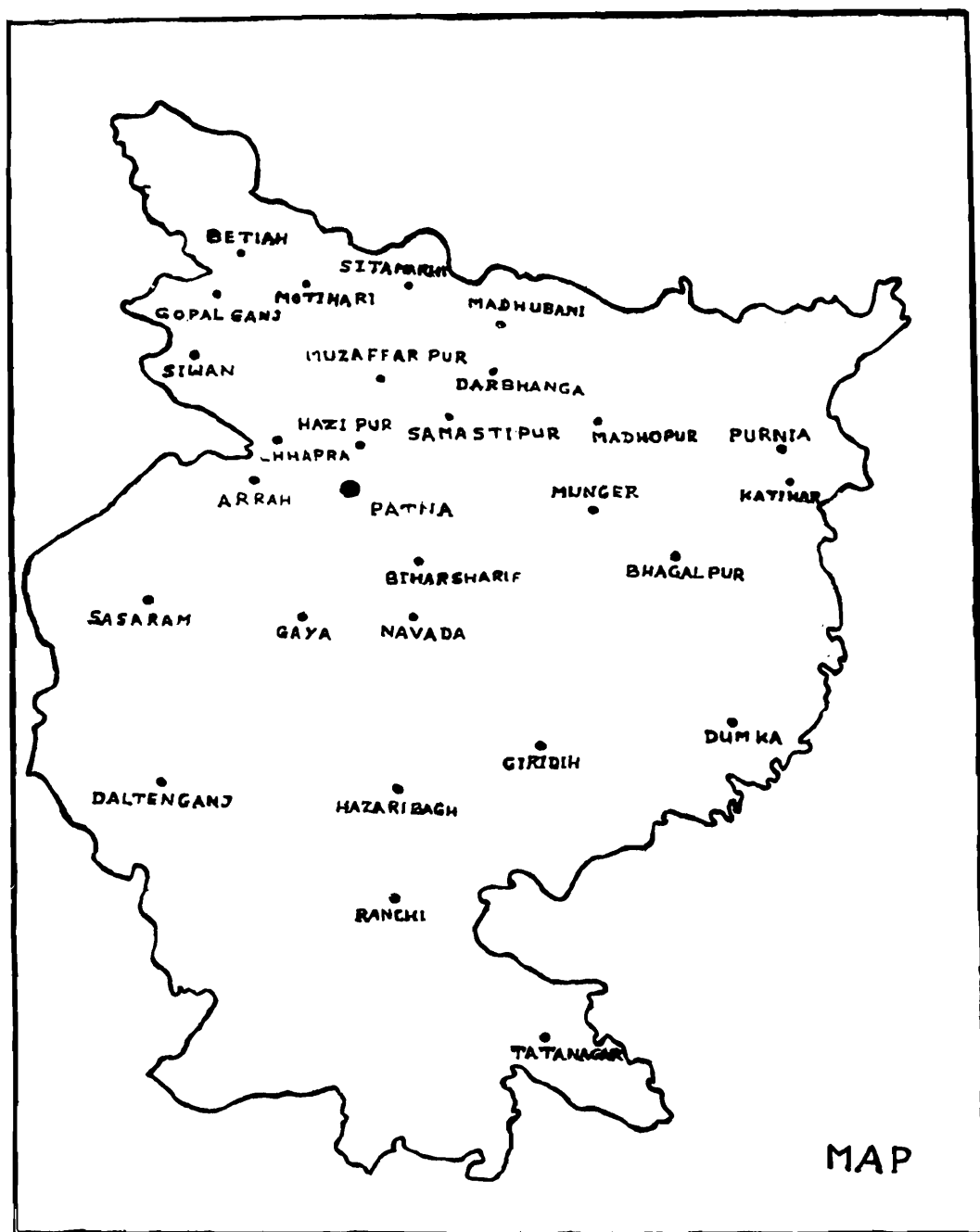
REFERENCES

- BHASIN, G. D. 1953. Odonata. In Roonwal *et. al.* : A systematic catalogue of the main identified collection of the Forest Research Institute, Dehra Dun, U. P., Part—12. *Indian Forest Leaflet*, (n.s.), 121 (3) : 63-79.
- DAVIES, D. A. L. & TOBIN, P. 1984. The Dargonflies of the world : A systematic list of the extant species of Odonata, Vol. I. *Soc. int. Odonatol. rapid. Comm. (Suppl.)* No. 3 : 127 pp.
- DAVIES, D. A. L. & TOBIN, P. 1985. The Dargonflies of the world : A systematic list of the extant species of Odonata, Vol. II. *Soc. int. Odonatol. rapid comm. (Suppl.)* No. 5 : 151 pp.
- FRASER, F. C. 1933. The Fauna of British India, including Ceylon & Burma, Odonata, Vol. I. *Taylor & Francis Ltd.*, London : 423 pp.

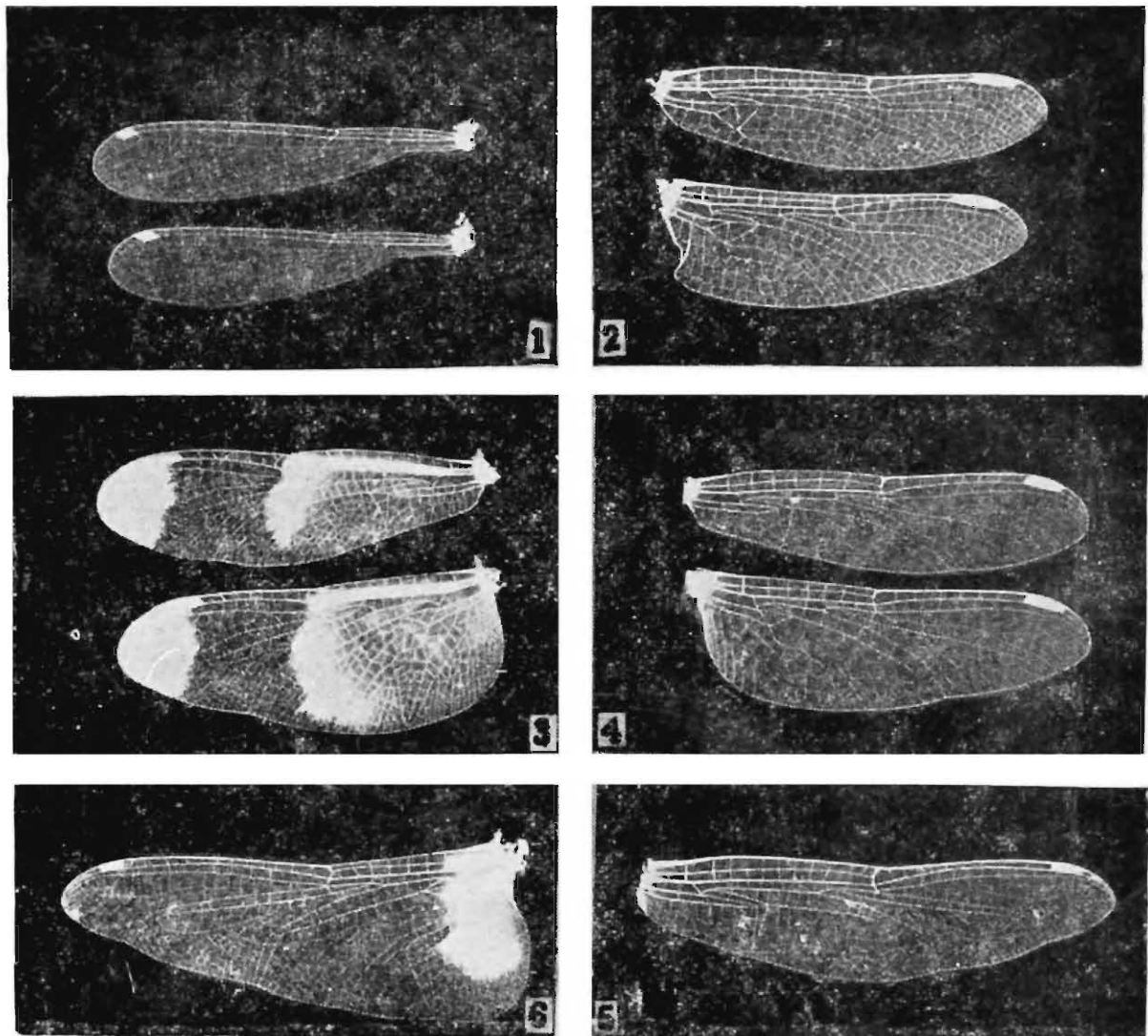
- FRASER, F. C. 1934. The Fauna of British India, including Ceylon & Burma, Odonata, Vol. II. *Taylor & Francis Ltd.*, London : 398 pp.
- FRASER, F. C. 1936. The Fauna of British India, including Ceylon & Burma, Odonata, Vol. III. *Taylor & Francis Ltd.*, London : 461 pp.
- KUMAR, A. & PRASAD, M. 1981. Field ecology, zoogeography and taxonomy of the Odonata of Western Himalaya, India. *Rec. zool. Surv. India, Occ. Pap.*, No. 20 : 1-118.
- MEHROTRA, P. N. 1959. On two new species of *Orthetrum* (Odonata : Libellulidae : Libellulinae). *Indian J. Ent.*, 21 : 137-138.
- PRASAD, M. & KUMAR, A. 1977. New records of Odonata, from Dhanbad, Bihar. *Newsl. Rec. zool. Surv. India*, 3(6) : 433-435.
- PRASAD, M., RAM, R. & GHOSH, S. K. (in press). Notes on the Indian species of the genus *Pseudagrion* Selys (Coenagrionidae : Odonata) *Bull. zool. Surv. India*.
- VARSHNEY, R. K. & GUHA, M. 1972. A note on the wing markings of the dragonfly *Rhyothemis variegata variegata* (L.) (Odonata : Libellulidae). *Patna Univ. J.*, 27 (2 & 4) : 1-4.
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Map of Bihar showing the localities.



Figs. 1-6. : 1. Forewing and hindwing of *Ceriagrion cerinorubellum* (Brauer), ♀. 2. Forewing and hindwing of *Nepogomphus modestus* (Selys), ♂. 3. Forewing and hindwing of *Neurothemis tullia tullia* (Drury), ♀. 4. Forewing and hindwing of *Brachydiplax sobrina* (Rambur), ♂. 5. Forewing of *Tamea basilaris burmeisteri* Kirby, ♂. 6. Hindwing of *Tamea basilaris burmeisteri* Kirby, ♂.