

NOTE ON THE ODONATA FAUNA OF CENTRAL INDIA.

By

TRIDIB RANJAN MITRA,  
*Zoological Survey of India, Calcutta*

INTRODUCTION

Central India is a part of the triangular plateau of the Indian Peninsula which has mostly been a land area ever since the Cambrian period (Wadia 1966). References on the odonate fauna of the area is available in Fraser (1919 b, c & d; 1920; 1933; 1934; 1936); Laidlaw (1917; 1919; 1920); Bhasin (1953); Baijal & Agarwal (1955). Where authors reported following species from different parts of the area viz., *Elatoneura nigerrima* (Laidlaw), *Disparoneura quadrimaculata* (Rambur), *Copera marginipes* (Rambur), *Pseudagrion microcephalum* (Rambur), *Pseudagrion hypermelas* Selys, *Ceriagrion olivaceum olivaceum* Laidlaw, *Coenagrion dyeri* (Fraser), *Cercion malayanum* (Selys), *Ischnura aurora aurora* (Brauer), *Rhodischnura nursei* (Morton), *Agriocnemis dabreui* Fraser, *Orolestes motis* Baijal & Agarwal, *Lestes viridula* Rambur, *Lestes umbrina* Selys, *Rhinocypha bisignata* Selys, *Onychogomphus grammicus* (Rambur), *Ictinogomphus rapax* (Rambur), *Potamarcha obscura* (Rambur), *Orthetrum taeniolatum* (Schneider), *Orthetrum sabina sabina* (Drury), *Orthetrum cancellatum cancellatum* (Linnaeus), *Orthetrum pruinatum neglectum* (Rambur), *Acisoma panorpoides panorpoides* Rambur, *Diplacodes trivialis* (Rambur), *Indothemis carnatica* (Fabricius), *Crocothemis servilia servilia* (Drury), *Crocothemis misrai* Baijal & Agarwal, *Brachythemis contaminata* (Fabricius).

The present paper reports twenty-one species for the first time from Mahadeo Hills of which *Pseudagrion decorum* (Rambur), *Pseudagrion rubriceps rubriceps* Selys, *Ceriagrion coromandelianum* (Fabr.), *Ischnura senegalensis* (Rambur), *Enallagma parvum* Selys, *Aciagrion pallidum* Selys, *Agriocnemis pygmaea pygmaea* (Rambur), *Bradinopyga geminata* Rambur, *Neurothemis intermedia intermedia* (Rambur), *Trithemis aurora aurora* (Burmeister), *Tramea basilaris burmeisteri* Kirby are new records from Central India.

The specimens were collected by the author during the period from October 21 to December 7 of 1971 from the districts of Bhandara and Nagpur of Maharashtra; Betul, Chhindwara and Seoni of Madhya Pradesh. The districts lie on Mahadeo hills (Lat. 21°-22° N., Long.

78°-80°E ; *Alt.* 600-900 meters). Besides the addition of species to the faunal list, variations are reported in morphological features either from the published descriptions or from the specimens of other localities, of India. Moreover, it contains some notes on habits and habitats of different species ; detailed geographical distribution of each species studied by the author, and a brief analysis of the fauna.

#### SYSTEMATICS

Order : ODONATA  
 Suborder : ZYGOPTERA  
 Family : PLATYCNEMIDIDAE  
 Genus : **Copera** Kirby

#### **Copera marginipes** (Rambur)

*Material examined* : 1 ♀ Chhindwara, 23 Nov. '71 ; 1 ♂, 1 ♀ (copulating pair), Chhindwara, 25 Nov. '71 ; 1 ♂, 1 ♀, Chhindwara, 26 Nov. '71, 1 ♂, Chhindwara, 27 Nov. '71, 2 ♀ ♀, Seoni, 3 Dec. '71.

*Remarks.* : Breeding activities of this species was noticed in the midday. Measurements of specimens agree with the measurements cited by Fraser (1933) ; the 'arc' in the specimens from Seoni is more distal to the distal antenodal nervure than in the specimens collected from Chhindwara. Moreover, the specimens from Seoni are paler than those from Chhindwara.

*Distribution* : *Present Records* : Chhindwara Seoni (Madhya Pradesh).  
*Past Records* : Parambikulum, Nagpur, Mormugaon (Laidlaw 1917) ; Mahabaleswar (Fraser 1921) ; Palni Hills, Fraser pet, Somarpet, Coorg, Poona, Khandala (Fraser 1924 b) ; Bollovompattis, Coorg, Malabar, Nilgiri, Deccan (Fraser 1931) ; Poona, Assam, North Bengal, Burma, throughout southern Asia and Sondaic Islands (Fraser 1933), Malayasia (Lieftinck 1954) ; South Andaman (Chhotani *et. al.* 1983).

Family : COENAGRIONIDAE  
 Genus : **Pseudagrion** Selys

#### **Pseudagrion decorum** (Rambur)

*Material examined* : 1 ♂, Bhandara, 24 Oct.' 71 ; 2 ♂ ♂, Bhandara, 29 Oct. 1971.

*Remarks* : The specimens differ from Calcutta specimens being more olivaceous than the latter.

*Distribution ; Present Record* : Bhandara (Maharashtra). *Past Records* : Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931) ; widely distributed throughout the continental India and Burma (Fraser 1933) ; Nepal (St. Quentin 1970). Calcutta (Mitra 1983).

**Pseudagrion rubriceps rubriceps Selys**

*Material examined* : 1 ♀, Multai (Betul) 12 Nov. '71 ; 1 ♂, Chhindwara, 26 Nov., '71.

*Remarks* : The black lines on the thorax of the male are thinner in the specimens from Chhindwara than in those Calcutta forms.

*Distribution ; Present Records* : Betul and Chhindwara (Madhya Pradesh). *Past Records* : Nagpur (Laidlaw 1919) ; Nilgiris, Coorg, Fraserpet, Poona, Khandala (Fraser 1924 b) ; Bollovompattis, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931) ; widely distributed throughout the plains and sub-montane areas of continental India and Burma except the desert tracts ; Java, Indo-China, Malayasia, Formosa (Fraser 1933) ; Calcutta (Mitra & Lahiri 1972) ; Dhanbad (Kumar & Prasad 1977) ; Assam (Lahiri 1979) ; Nepal (St. Quentin 1970) ; Malayasia (Lieftinck 1954).

**Pseudagrion hypermelas Selys**

*Material examined* : 1 ♀, Bhandara, 29 Oct. '71 ; 1 ♂, Chhindwara, 20 Nov. '71.

*Remarks* : No variation was noticed in the specimens from the description provided by Fraser (1933).

*Distribution ; Present Records* : Bhandara (Maharashtra), Chhindwara (Madhya Pradesh). *Past Records* : Kierpur (Laidlaw 1919) ; Deesa, Sombong, Sumatra (Laidlaw 1916) ; Central provinces, Deccan areas of the Bombay presidency and South Punjab (Fraser 1933).

**Genus : Ceriagrion Selys**

**Ceriagrion coromandelianum (Fabricius)**

*Material examined* : 1 ♂, Bhandara, 23 Oct. '71 ; 1 ♂, Bhandara, 24 Oct. '71 ; 1 ♂, Seoni, 2 Dec. '71.

*Remarks* : Specimens from Seoni agree with the colour of the specimens from Manipur ; but specimens from Bhandara agree with the colour of the specimens from Calcutta being more yellowish than the forms.

*Distribution : Present Records :* Bhandara (Maharashtra), Seoni (Madhya Pradesh). *Past Records :* Mahabaleswar (Fraser 1921); Bollovompattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris (Fraser 1931); throughout India, Ceylon, Burma, Malayasia, Indo-China, South China (Fraser 1933); Calcutta, Manipur (Mitra 1975a). Dhanbad (Prasad & Kumar 1977); Assam & Mizoram (Lahiri 1979); Nepal (St. Quentin 1970).

### **Ceriagrion olivaceum olivaceum Laidlaw**

*Material examined :* 1 ♀, Bhandara, 22 Oct. '71.

*Remarks :* The specimen from Bhandara is lighter in thoracic colour than that of the Manipur form.

*Distribution : Present Record :* Bhandara (Maharashtra). *Past Records :* Assam (Laidlaw, 1919; Lahiri 1979); Poona, Satara (Fraser 1924 b); Deccan (Fraser 1931); Meghalaya Burma (Fraser 1933); Manipur (Mitra 1975 a), Calcutta (Mitra 1983).

### **Genus : Ischnura Charpentier**

#### **Ischnura aurora aurora (Brauer)**

*Material examined :* 1 ♂, Chhindwara, 29 Nov. '71.

*Remarks :* The specimen differs from Calcutta forms in having azure blue marking on the abdominal segments 8 to 10 which is black in specimens from Calcutta. It is a weak flier, rests off and on grass blades.

*Distribution : Present Record :* Chhindwara (Madhya Pradesh). *Past Records :* Maharashtra (Laidlaw 1919); Coimbatore, Cochin, Malabar, Nilgiris (Fraser 1931); throughout the southern Asia, India, Ceylon, Burma, Malayasia, the Sundaic Archipelago, Borneo, New Guinea, Australasia, Philippines and Samoa (Fraser 1933); Uttar Pradesh, Madras (Bhasin 1953); Calcutta (Lahiri & Mitra 1976); Dhanbad (Prasad & Kumar 1977); Arunachal Pradesh (Lahiri 1979); Malayasia (Lieftinck 1954); Nepal (St. Quentin 1970).

#### **Ischnura senegalensis (Rambur)**

*Material examined :* 1 ♀, Bhandara, 28 Oct. '71 : 1 ♀, Seoni, 2 Dec. '71.

*Remarks :* No remarkable variations from the description provided by Fraser (1933) and specimens of other localities were noticed.

*Distribution : Present Records :* Bhandara (Maharashtra), Seoni (Madhya Pradesh). *Past Records :* Calcutta, Orissa, Sarlake (Laidlaw 1916) ; Coorg (Fraser 1924 b) ; Barkuda island (Fraser and Dover 1922) ; Coorg, Deccan, Malabar Nilgiris, (Fraser 1931) ; throughout India, Burma, Ceylon, Japan, Philippines, Africa (Fraser 1933) ; Dhanbad (Prasad & Kumar 1977) ; Malayasia (Lieftinck 1954) ; Rajasthan (Bose & Mitra 1976) ; Andaman (Chhotani *et. al.* 1983), Calcutta (Mitra 1983).

Genus : **Enallagma** Charpentier

**Enallagma paryum** Selys.

*Material examined :* 1 ♂, Bhandara, 24 Oct. '71, 1 ♀, Bhandara, 28 Oct. '71, 2 ♀, Bhandara 29 Oct. '71, 1 ♂, 1 ♀ (in tandem), Bhandara, 29 Oct. '71.

*Remarks :* The male specimens from Bhandara are more olivaceous than the specimens from Calcutta.

*Distribution Present Record :* Bhandara (Maharashtra) *Past Records :* Throughout South Asia ; India, Burma, Ceylon (Fraser 1933) ; Ceylon (Laidlaw 1951) ; Calcutta (Lahiri & Mitra 1976).

Genus : **Aciagrion** Selys

**Aciagrion pallidum** Selys

*Material examined :* 1 ♀, Seoni, 2 Dec. '71.

*Remarks :* The antehumeral stripe in the specimen is broken hence it differs from Assam where it is complete.

*Distribution : Present Records :* Seoni (Madhya Pradesh). *Past Records :* Dibrugarh (Laidlaw 1914) ; Nurbong (bottom of the Mahanadi valley of Darjeeling), Nagpur, Mormugao, Kanara, (Laidlaw 1919) ; Poona, Satara, Khandala Mahabaleshwar (Fraser 1924 b) ; Assam, Arunachal Pradesh and Manipur (Lahiri 1979).

Genus : **Agriocnemis** Selys

**Agriocnemis pygmaea** (Rambur)

*Material examined :* 1 ♀, Bhandara, 24 Oct. '71, 1 ♂, Bhandara, 22 Oct. '71, 1 ♀, Chhindwara, 27 Nov. '71.

*Remarks :* The specimens do not differ from the specimens of eastern India.

*Distribution : Present Records :* Bhandara (Maharashtra), Chhindwara (Madhya Pradesh). *Past Records :* Calcutta (Selys, 1891 ; Mitra 1975 b) ; Java, Rainbode, Nicobars (Hagen 1858) ; Ceylon and Philippines (Kirby 1898) ; Samarang, Sydney, N. S. Wales (Ris 1912) ; Rajasthan (Bose & Mitra 1976), Dhanbad (Prasad & Kumar 1977) ; Assam, Mizoram, Arunachal Pradesh (Lahiri 1979) ; Malayasia (Lieftinck 1954) ; Singapore (Brauer 1864) ; China (Klots 1947).

Suborder : ANISOPTERA

Family : LIBELLULIDAE

Genus : **Orthetrum** Newman

**Orthetrum sabina sabina** (Drury)

*Material examined :* 1 ♂, Nagpur, 29 Oct. '71.

*Remarks :* The specimen appears as a subadult form.

*Distribution : Present Record :* Nagpur (Maharashtra) *Past Records :* Mahabaleshwar (Fraser 1921) ; Barkuda island (Fraser & Dover 1922) ; Anaimalai, Mudi hills, Coimbatore, Cochin, Coorg, Kanara, Malabar, Nilgiris and Palni Hills (Fraser 1931) ; Assam, Bihar, Punjab, Uttar Pradesh, Burma (Bhasin 1953) ; Nainital (Sahni 1964) ; Gwalior (Baijal & Agarwal 1955) ; Calcutta (Mitra & Lahiri 1974) ; Tripura (Mitra & Sen 1975) ; Dhanbad (Prasad & Kumar 1977) ; Assam, Arunachal Pradesh (Lahiri 1979) ; Burma (Laidlaw 1914) ; Ceylon, Mesopotamia (Fraser 1918) ; Holarctic (Needham 1932) ; Andaman islands, Philippines, Mesopotami, Asia Minor, to North Africa (Fraser 1929 a) ; Nepal (Sr. Quentin 1970) ; Malayasia (Lieftink 1954) ; China (Klots 1947).

**Orthetrum cancellatum cancellatum** (Linnaeus)

*Material examined :* 3 ♂ ♂ Chhindwara, 25 Nov. '71 ; 1 ♂, 2 ♀ ♀, 27 Nov. '71, (one female was caught with the male in copulation over a rocky fast flowing stream at midday).

*Remarks :* The specimens do not vary much from the description provided by Fraser (1933).

*Distribution : Present Records :* Chhindwara (Madhya Pradesh) *Past Records :* Kasimir (Needham 1932) ; Gwalior (Baijal & Agarwal 1955) ; a palaearctic species extending from the British Isles across Europe, N. Africa to Asia Minor, Kashmir (Fraser 1936).

**Orthetrum pruinatum neglectum** (Rambur).

*Material examined* : 1 ♂, Betul, 6 Nov. '71 1 ♂ Chhindwara, 26 Nov. '71, 3 ♂ Chhindwara, 27 Nov. '71.

*Remarks* : The male hovers over the ovipositing female very seriously and attacks every intruder in the area.

*Distribution* : *Present Records* : Chhindwara, Betul (Madhya Pradesh), *Past Records* : Assam and Burma (Laidlaw 1914) ; Anaimalai and Mudi Hills, Bollovompattis, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiris, Palnis, Travancore (Fraser 1931) ; Burma and Ceylon (Needham 1932) ; Tripura (Mitra & Sen 1975 ; Lahiri 1976) ; Arunachal Pradesh, Mizoram, Manipur (Lahiri 1979) ; Dhanbad (Prasad & Kumar 1977) ; Malayasia (Lieftinck 1954) ; Nepal (St. Quentin 1970) ; Andaman, Indo-China, Ceylon, South China (Fraser 1924 a).

Genus : **Potamarcha** Karsch

**Potamarcha obscura** Rambur

*Material examined* : 1 ♀, Chhindwara, 20 Nov. '71.

*Remarks* : The specimen does not show remarkable variation from the description provided by Fraser (1933).

*Distribution* : *Present Record* : Chhindwara (Madhya Pradesh), *Past Records* : Mahabaleswar (Fraser 1921) ; Nilgiris, Poona, Khandala, Coorg, Deccan, South Kanara, Malabar, Nilgiris (Fraser 1931), Dhanbad (Prasad & Kumar 1977) ; Burma and Ceylon (Needham 1932) ; Nepal (St. Quentin 1970) ; Malayasia (Lieftinck 1954).

Genus : **Diplacodes** Kirby

**Diplacodes trivialis** (Rambur)

*Material examined* : 1 ♀, Bhandara, 22 Oct. '71 ; 1 ♀, Chhindwara, 27 Nov. '71 ; 1 ♀ Seoni, 1 Dec. '71.

*Remarks* : The specimens do not vary much from the description by Fraser (1933) nor from the specimens from Calcutta and Manipur.

*Distribution* : *Present Records* : Bhandar (Maharashtra) ; Chhindwara, Seoni (Madhya Pradesh), *Past Records* : Assam and Burma (Laidlaw 1914) ; Mahabaleswar (Fraser 1921) ; Barkuda island (Fraser & Dover 1922) ; Anaimalai, Mudi hills, Coimbatore, Cochin, Coorg, Deccan, Kanara, Malabar, Nilgiri hills (Fraser 1931) ; Maharashtra, Uttar Pradesh, and Burma (Bhasin 1953) ; Manipur (Mitra 1975) ; Assam Manipur, Mizoram (Lahiri 1979) ; Tripura (Lahiri 1976) ; Dhanbad (Prasad & Kumar 1977) ; Singapore, Java, New Guinea, Mesopotamia

(Fraser 1919) ; Ceylon, East Indies, and China (Needham 1932) ; Nepal (St. Quentin 1970) ; Philippines (Asahina 1968) ; Malayasia (Lieftinck 1954) ; Andaman islands, Japan, Australia, Philippines, throughout southern Asia to North Africa (Fraser 1924 a) ; China (Klots 1947).

Genus : **Crocothemis** Brauer

**Crocothemis servilia servilia** (Drury)

*Material examined* : 1 ♂, Chhindwara, 20 Nov. '71 ; 2 ♂ ♂, Chhindwara, 27 Nov. '71.

*Remarks* : The basal marking of the hind wing of the specimens are less extent than that of Calcutta forms.

*Distribution* : *Present Record* : Chhindwara (Madhya Pradesh), *Past Records* : Barkuda island (Fraser & Dover 1922) ; Coorg, Deccan, Malabar, Nilgiri hills (Fraser 1931) ; Burma (Laidlaw 1914) ; Basra, Suez (Fraser 1919) ; Bihar, Uttar Pradesh, Iraq. (Bhasin 1953) ; Nainital (Sahni 1964) ; Calcutta (Mitra 1983), Dhanbad (Prasad & Kumar 1977) ; Assam, Arunachal Pradesh and Mizoram (Lahiri 1979) ; Malayasia (Lieftinck 1954), Nepal (St. Quentin 1970) ; South Andamans (Chhotani *et al.* 1983), China (Khots 1947).

Genus : **Bradinopyga** Kirby

**Bradinopyga geminata** Rambur

*Material examined* : 1 ♂, Nagpur, 29 Oct. '71.

*Remarks* : The specimen agrees with description provided by Fraser (1936).

*Distribution* : *Present Record* : Nagpur (Maharashtra) *Past Records* : Mahabaleswar (Fraser 1921) ; Coorg (Deccan, Malabar, Nilgiris, Coim-tore (Fraser 1931) ; New Delhi, Gwalior (Baijal & Agarwal 1955) ; Nainital (Sahni 1964) ; Calcutta (Mitra 1983) ; Dhanbad (Prasad & Kumar 1979) ; Ceylon and Burma (Fraser 1919) ; Rajasthan (Bose & Mitra 1976),

Genus : **Neurothemis** Brauer

**Neurothemis intermedia intermedia** (Rambur)

*Material examined* : 1 ♂, Chhindwara, 27 Nov. '71.

*Remarks* : The specimen agrees with the description provided by Fraser in his Fauna of British India (1936).

*Distribution* : *Present Record* : Chhindwara (Madhya Pradesh), *Past Records* : Bombay, Khandala, Poona, Nilgiris, Malabar, Burma (Fraser



1924 b) ; Anaimalai, Mudi hills, Coorg, Deccan, Kanara, Malabar, Nilgiri (Fraser 1931) ; Assam, Arunachal Pradesh, Manipur, Mizoram (Lahiri 1979) ; Nepal (St. Quentin 1970) ; Great Nicobar (Chhotani *et. al.* 1983).

Genus : **Trithemis** Brauer

**Trithemis aurora** (Burmeister)

*Material examined* : 1 ♂, Betul, 4 Nov. '71 ; 1 ♂, Betul, 6 Nov. '71 ; 1 ♂, 1 ♂, Chhindwara, 20 Nov. '71 ; 3 ♀ ♀, Chhindwara, 21 Nov. '71 ; Chhindwara, 25 Nov. '71 ; 1 ♀, 2 ♂, Chhindwara, 26 Nov. '71 ; 1 ♀, Chhindwara, 27 Nov. '71.

*Remarks* : The specimens do not differ from the description provided by Fraser (1936).

*Distribution* : *Present Records* : Betul, Chhindwara (Madhya Pradesh). *Past Records* : Bengal (Selys 1891) ; Assam and Burma (Laidlaw 1914) ; Anaimalai and Mudi hills (Fraser 1931) ; Poona, Khandala, Mahabaleswar (Fraser 1924 b) ; Dhanbad (Prasad & Kumar 1977) ; Arunachal Pradesh, Manipur, Mizoram (Lahiri, 1979) ; Rajasthan (Bose & Mitra 1976) ; Nepal (St. Quentin 1970) ; Malayasia (Lieftinck 1954) ; China (Klots 1947).

Genus : **Tramea** Hagen

**Tramea basilaris burmeisteri** Kirby

*Material examined* : 1 ♂, Bhandara, 21 Oct. '71.

*Remarks* : The specimen was lying dead on the road at the time of collection, hence it is presumed that the specimen suffered from natural death. Similar observations were made by Mitra (1977) with other species in Calcutta.

*Distribution* : *Present Record* : Bhandara (Maharashtra). *Past Records* : Mahabaleswar (Fraser 1921) ; Barkuda island (Fraser & Dover 1922) ; Bombay throughout the continental India and extending into Tibet in the north and to Ceylon southwards ; Burma, Indomalaya (Fraser 1920) ; Coimbatore, Coorg, Deccan, Kanara, Malabar, Nilgiri hills (Fraser 1931) ; Bharatpur, Saugor, (Baijal & Agarwal 1955) ; Chilka lake (Dasgupta 1957) ; Calcutta (Mitra 1983) ; Dhanbad (Prasad & Kumar 1977) ; Nepal (St. Quentin 1970) ; Rajasthan (Bose & Mitra 1976).

*Faunal characteristics* : Analysis of distribution of species reveals that the area supports species which have following types of distribution.

1. Confined to Peninsular India : *Elatoneura nigerrima* Laidlaw, *Disparoneura quadrimaculata* Selys, *Pseudagrion hypermelas* Selys, *Coenagrion dyeri* (Fraser), *Orolestes motis* Baijal and Agarwal, *Rhinocypha bisignata* Selys, *Crocothemis misrai* Baijal & Agarwal.

2. Confined to India : *Rhodischnura nursei* (Morton), *Lestes viridula* (Rambur).

3. Confined to Oriental region : *Pseudagrion decorum* (Rambur), *Pseudagrion rubriceps rubriceps* Selys, *Ceriagrion olivaceum olivaceum* Laidlaw, *Enallagma parvum* Selys, *Cercion malayanum* Selys, *Agriocnemis dabreui* Fraser, *Aciagrion pallidum* Selys, *Lestes umbrina* Selys, *Ictinogomphus rapax* (Rambur), *Orthetrum taeniolatum* (Schneider), *Orthetrum pruinosum neglectum* (Rambur), *Bradinyopyga geminata* (Rambur), *Potamarcha obscura* Rambur, *Brachythemis contaminata* (Fabr.), *Indothemis carnatica* (Fabr.), *Neurothemis intermedia intermedia* (Rambur).

4. Confined to Old World : *Copera marginipes* (Rambur), *Ceriagrion coramandelianum* (Fabr.), *Ischnura aurora aurora* (Brauer), *Ischnura senegalensis* (Rambur), *Agriocnemis pygmaea pygmaea* (Rambur), *Orthetrum sabina sabina* (Drury), *Orthetrum cancellatum cancellatum* (Linn.), *Diplacodes trivialis* (Rambur), *Crocothemis servilia servilia* (Drury), *Tramea basilaris burmeisteri* Kirby.

#### SUMMARY

This paper adds eleven species to the previously known twenty eight species from central India and reports a brief analysis of the fauna, gives detailed geographical distribution of 21 species studied by the author along with notes on habit and habitat of some species.

#### ACKNOWLEDGEMENTS

The author thanks to the Director, Zoological Survey of India, for facilities, Dr. A. K. Ghose, Scientist-D, Dr. S. K. Tandon, S. M. Ali, Scientist-C and Dr. V. D. Srivastava, Scientist-B of the same department for encouragements. Finally the author expresses gratefulness to Dr. (Mrs.) Leonora K. Gloyd, the University of Michigan, U. S. A. for necessary correction on the manuscript for the improvement of the paper.

#### REFERENCES

- ASAHINA, S. 1968. Records and notes on Philippine Odonata. *Jap. J. Zool.*, Tokyo, 15 : 349-376.
- BAIJAL, H. N. & Agarwal, J. P. 1955. Opuscula Libellulologica. I. *Agra Univ. J. Res. (Sci.)*, Agra, 4 : 453-470.

- BHASIN, G. D. 1953. Odonata, *Indian Forest Leaflet*, Dehra Dun, **121** : 63-69.
- BOSE, G. & MITRA, T. R. 1976. The Odonata fauna of Rajasthan. *Rec. zool. Surv. India*, Calcutta, **71** : 1-11.
- BRAUER, F. 1864. Erster Bericht über die auf der Weltfahrt der Kais, Fregatte Novara gesammelten. Neuropteren. *Verh. zool-bot. Ges. Wien.*, Wien, **8** : 478-481.
- CHHOTANI, G., A. R. LAHIRI, & T. R. MITRA, 1983. Contribution to the Odonate (Insecta) fauna of Andaman and Nicobar islands with description of two new species. *Rec. zool. Surv. India*, Calcutta, **80** : 467-494.
- FRASER, F. C. 1918. Indian dragonflies. Part 3. *J. Bombay nat. Hist. Soc.*, Bombay, **16** : 141-171.
- FRASER, F. C. 1919 (a). Indian dragonflies. Part 4. *J. Bombay nat. Hist. Soc.*, Bombay, **16** : 488-517.
- FRASER, F. C. 1919 (b). Indian dragonflies. Part 5. *J. Bombay nat. Hist. Soc.*, Bombay, **16** : 734-744.
- FRASER, F. C. 1919 (c). Description of four new Indian Odonata. *Rec. Indian Mus.*, Calcutta, **16** : 451-455.
- FRASER, F. C. 1919 (d). Descriptions of new Indian Odonate larvae and exuviae. *Rec. Indian Mus.*, Calcutta, **16** : 459-467.
- FRASER, F. C. 1920. Notes on Indian dragonflies. *Rec. Indian Mus.*, Calcutta, **19** : 31-33.
- FRASER, F. C. 1921. A list of dragonflies recorded from Mahabaleshwar. *J. Bombay nat. Hist. Soc.*, Bombay, **27** : 540-544.
- FRASER, F. C. & C. DOVER, 1922. The dragonflies of Barkuda Island. *Rec. Indian Mus.*, Calcutta, **24** : 303-311.
- FRASER, F. C. 1924 (a). Report on a collection of dragonflies (Odonata) from the Andaman islands. *Rec. Indian Mus.*, Calcutta, **26** : 409-413.
- FRASER, F. C. 1924 (b). A survey of the Odonata (dragonfly) fauna Western India with special remarks on the genera *Macromia* and *Idionyx* and description of thirty new species with Appendices I, II. *Rec. Indian Mus.*, Calcutta, **26** : 423-522.
- FRASER, F. C. 1931. Additions to the survey of the Odonate (dragonfly) fauna of Western India with descriptions of nine new species. *Rec. Indian Mus.*, Calcutta, **33** : 443-474.

- FRASER, F. C. 1933. Fauna of British India, Odonata, Vol. I. pp 1+423 Taylor & Francis, London.
- FRASER, F. C. 1934. Fauna of British India, Odonata, Vol. II. pp.xxiii 398 Taylor & Francis, London.
- FRASER, F. C. 1936. Fauna of British India, Odonata, Vol. III. ppxi+461 Taylor & Francis, London.
- HAGEN, Dr. 1858. Odonata. pp. 478-481 In Hagen Dr. "Synopsis der Neuroptera Ceylon". *Verh. zool.-bot. Ges. Wien*, **8** : 471-488.
- KIRBY, W. F. 1894. Catalogue of the described Neuroptera Odonata (dragonfly) of Ceylon with descriptions of new species. *J. Linn. Soc.*, **24** : 545-566.
- KLOTS, E. B. 1947. Chinese dragonflies (Odonata) in the American Museum of Natural History. *Am. Mus. Novit.* No. 1341 : 1-15.
- LAHIRI, A. R. & MITRA, T. R. 1976. Notes on some damselflies (Odonata : Zygoptera) of Calcutta. *Ent. News U. S. A.* **87** : 295-298.
- LAHIRI, A. R. 1977. New records of Odonata from Tripura and Arunachal Pradesh. *Proc. zool. Soc., Calcutta*, Calcutta, **30** : 45-49.
- LAHIRI, A. R. 1979. Odonata (Insecta) from different states of north eastern India. *Oriental Ins.*, Delhi, **13** : 119-132.
- LAIDLAW, F. F. 1914. Odonata. In Zoological Results of the Abor Expedition. *Rec. Indian Mus.*, Calcutta, **8** : 335-349.
- LAIDLAW, F. F. 1916 (a). Notes on Oriental dragonflies in the Indian Museum. No. 4. *Rec. Indian Mus.*, Calcutta, **12** : 21-25.
- LAIDLAW, F. F. 1916 (b). Notes on Indian Odonata. *Rec. Indian Mus.*, Calcutta, **12** : 129-136.
- LAIDLAW, F. F. 1917. A list of dragonflies recorded from the Indian Empire with special reference to the collection of the *Indian Museum* Part II. The Family Agrionidae. *Rec. Indian Mus.*, Calcutta, **13** : 321-348.
- LAIDLAW, F. F. 1919. A list of dragonflies recorded from the Indian Empire with special reference to the collection of the Indian Museum. Part II. *Rec. Indian Mus.*, Calcutta, **16** : 169-195.
- LAIDLAW, F. F. 1920. A list of dragonflies recorded from the Indian Empire with special references to the collection of the Indian Museum. Part III. *Rec. Indian Mus.*, Calcutta, **19** : 145-163.
- LAIDLAW, F. F. 1951. A note on the derivation of the Odonata fauna of the islands of Ceylon, *Ent. News*, **62** : 77-83,

- LIEFTINCK, M. A. 1954. Handlist of Malaysian Odonata. *Treubia*, 22 (Suppl) : xiii+1 - 202.
- MITRA, T. R. 1975 (a). On a collection of Odonata from Manipur, India. *Ent. News*, U. S. A., 86 (9 & 10) : 213-216.
- MITRA, T. R. 1975 (b). A review of the Indian species of *Agriocnemis* Selys (Insecta : Odonata : Zygoptera : Coenagrionidae) with a note on *Agriocnemis nainitalensis* Sahni. *B. S. Chauhan Comm. Vol.*, Zoological Soc. India, Bhubaneswar, pp. 403-409.
- MITRA, T. R. 1977. Field observation on the death of adult dragonflies. *Odonatologica*, Utrecht, 6 : 27-33.
- MITRA, T. R. 1983. A list of Odonata of Calcutta. *Entomologist's mon. Mag.*, 119 : 29-31.
- MITRA, T. R. & A. R. LAHARI, 1974. Notes on the distribution of some dragonfly species (Odonata, Anisoptera) of Bengal. *Entomologist's Rec. J. Var.*, 86 : 73-74.
- MITRA, T. R. & G. C. SEN, 1975. First records of dragonflies (Odonata, Anisoptera) from Tripura (India) *Entomologist's Rec. J. Var.*, 87 : 119-120.
- NEEDHAM, J. C. 1932. Key to the dragonflies of India. *Rec. Indian Mus.*, Calcutta, 34 : 195-228.
- PRASAD, M. & A. KUMAR, 1977. New records of odonata from Dhanbad, Bihar, *Newsl. zool. Surv. India*, Calcutta, 3 : 433-435.
- RIS, F. 1912. Über Odonaten von Java und Krakatau. *Tijdschr. Ent.*, 55 : 157-183.
- SAHNI, D. N. 1964. Survey of the Insect fauna of Nainital. Odonata (Anisoptera). *Agra Univ. J. Res. (Sci.)*, Agra, 13 : 89-93.
- ST. QUENTIN, D. 1970. Odonata aus Nepal. *Khumbu Himal*, Bd. 3. Lf. g. 3. S. 389-411.
- SELYS-LONGCHAMPS, E. DE. 1891. Viaggio di Leonardo Fea in Birmaniae Regioni Vicine xxxii. Odonates. *Annali Mus. Civ. Stor. nat. Genoa*, Ser. 2, 10 (30) : 435-518.
- WADIA, D. N. 1966. Geology of India. Third (Revised Edition). pp. XX+536 ; MacMillian Co. London.