

**A REVIEW OF INDIAN CHLOROCYPHIDAE (INSECTA : ODONATA)  
WITH ADDITIONAL NOTES ON TAXONOMY AND DISTRIBUTION  
FOR SOME SPECIES AND DESCRIPTION OF  
A NEW SUBSPECIES**

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**INTRODUCTION**

Fraser's (1934) account of Indian Chlorocyphidae preceded and followed by number of important revisional contribution on the group including those of Cowley (1937), Fraser (1949, 1957), Laidlaw (1917, 1950) and Montgomery (1967). Our knowledge about the Indian fauna of the group has also been augmented through the works of Bhasin (1953), Chhotani et.al. (1983), Kumar (1973), Kumar and Prasad (1977, 1981), Lahiri (1977, 1979, 1985), Lahiri and Sinha (1985), Prasad (1976), Prasad and Singh (1976), Rao and Lahiri (1983) and Singh and Prasad (1976).

Data on material collected in course of a number of recent surveys sponsored by the Zoological Survey of India, Calcutta have been reported in the present account of the family together with a review of the Indian species of the group and description of a new subspecies.

Fraser (1949) and Laidlaw (1950) proposed a number of new genera for various species or species groups of the genera *Rhinocypha* Rambur and *Libellago* Selys. These new genera have not, however been generally accepted and here also, the two genera, viz. *Rhinocypha* Rambur and *Libellago* Selys have been used in the broader sense of the term.

**SYSTEMATIC ACCOUNT**

*A list of Chlorocyphid species and subspecies known from Indian union.*

Fraser (1934) reported 25 Chlorocyphid species and subspecies from various parts of Indian union including one each belonging to the genera *Calocypha* Fraser and *Chlorocypha* Fraser, four to the genus *Libellago* Selys and the rest to the genus *Rhinocypha* Rambur. However, Singh and Prasad (1976) and Lahiri and Sinha (1985) suppressed *R. bifasciata* Selys and *R. bifenestrata* Fraser under *R. trifasciata* Selys and *R. cuneata* Selys respectively. Chhotani et. al. (1983) treated *Libellago andamanensis* Fraser as a subspecies of *L. limeata* (Burmeister). Lahiri (1987) raised *R. perforata beatifica* Selys to species status. In the present paper a new subspecies viz. *R. hilaryae miaoa* has been added to Indian Chlorocyphid

fauna which thus, at present, comprises of the following 24 species and subspecies.

1. *Calocypha laidlawi* (Fraser)
2. *Chlorocypha vittata* (Selys)
3. *Libellago lineata andamanensis* Fraser
4. *L. l. blanda* (Selys)
5. *L. l. indica* (Fraser)
6. *L. l. lineata* (Burmeister)
7. *Rhinocypha beatifica* Selys
8. *R. biforata abbreviata* Fraser
9. *R. b. beelsoni* Fraser
10. *R. b. delimbata* Selys
11. *R. bisignata* Selys
12. *R. cuneata* Selys
13. *R. fenestrella* Rambur
14. *R. hiliaryae miaoa* subsp. nov.
15. *R. ignipennis* Selys
16. *R. immaculata* Selys
17. *R. perforata limbata* Selys
18. *R. quadrimaculata hemihyalina* Fraser
19. *R. q. quadrimaculata* Selys
20. *R. spuria* Selys
21. *R. trifasciata* Selys
22. *R. trimaculata* Selys
23. *R. unimaculata* Selys
24. *R. vitrinella* Fraser

### Genus *Libellago* Selys 1840

#### *Libellago lineata indica* (Fraser)

1919. *Micromerus lineatus indicus* Fraser, *Rec. Indian Mus.*, **16** : 197.

1934. *Libellago lineata indica* Fraser, *Fauna British India, Odonata*, **2** : 63 ; Cowley, 1937, *Trans. R. ent. Soc., London*, **86** : 4.

*Material examined* : 9 exs ; 1 ♂, 1 ♀, Madhya Pradesh, Bastar, Chitnakut, Jagdalpur, 2.xi.1979, coll. S. Ahmed and party ; 1 , Kerala, Prema, 800 ft., foot of Annamalai Hills (W), 12-14. viii. 1929, coll. H. S. Pruthi; 6 exs., MAHARASHTRA, coll. A.R. Lahiri and party; 2 ♂♂, 3 ♀♀, Mula river bank, 23 kms. N.W. of Ahmednagar, 15.iv.1983; 1 , Ambarali, 17.iv.1983.

*Measurements (in mm) and Nodal index* (for males and females respectively); Length of abdomen : 14.0-16.0, 15.0 ; Length of hind wing : 20.0, 20.0-22.0; number of antenodal veins : forewing : 6-7, 5-7; hindwing : 5-6, 5-7; number of postnodal veins : forewing : 10-11, 9-12; hindwing : 10-11, 9-11.

*Note* : The subspecies has here been recorded for the first time from North India (Madhya Pradesh). The males studied vary from the description of the species provided by Fraser (1934) in having longer hindwing.

**Distribution** : India : Madhya Pradesh, Maharashtra, Kerala, Tamil Nadu. Outside India : Ceylon.

**Libellago lineata lineata** (Burmeister)

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

1934. *Libellago lineata lineata* (Burmeister), Fraser, *Fauna British India, Odonata*, 2 : 60 ; Cowley, 1937. *Trans. R. ent. Soc., London*, 86 : 4 ; Bhasin, 1953, *Indian Forest Leaflet*, 121 : 69 ; Prasad and Singh, 1976, *Rec. zool. Surv. India*, 70 : 130.

**Material examined** : 16 exs.; 15 exs., TRIPURA; 14 exs., coll. M.S. Shishodia and party; 7♂♂, 6♀♀, Garjee, Udaipur (6♂♂, 6♀♀, 7.xi.1974; 1 ♂, 5.xi.1974); 1 ♂, Pratapgarh, Agartala 29.x.1971; 1 ♀, Pratapgarh, Agartala, coll. J.K. Jonathan and Party, 15.v.1978; 1 ♀, MANIPUR, 3 kms N.W. of Moreh (Alt. 2000'), coll. M.S. Shishodia and party, 25.ix.1975.

**Measurements (in mm) and Nodal index** (for males and females respectively); Length of abdomen : 13.0-15.0, 12.0-13.0 ; Length of hindwing : 17.0-18.0, 18.0-20.0; number of antenodal veins : forewing : 4-6, 5-9; hindwing : 5-7, 5-7; number of postnodal veins : forewing 10-12, 7-10; hindwing : 9-12, 8-11.

**Note** : This subspecies has been recorded here for the first time from Manipur and Tripura states of the Indian union. Specimens studied exhibit lower range in respect of nodal index and measurements of body parts as compared to the description of the species provided by Fraser (1934).

**Distribution** : India : Assam, Himachal Pradesh, Manipur, Tripura, Uttar Pradesh, West Bengal. Outside India : Burma, Thailand, Vietnam, Malay peninsula, Borneo, Indonesia.

**Genus Rhinocypha** Rambur 1842

**Rhinocypha bisignata** Selys

1853. *Rhinocypha bisignata* Selys, *Syn. Cal.*, : 62 ; Laidlaw, 1917, *Rec. Indian Mus.*, 13 : 26, 38 ; Fraser, 1934, *Fauna British India, Odonata*, 2 : 49 ; Rao and Lahiri, 1983, *J. Bombay nat. Hist. Soc.* 79 : 557.

1949. *Heliocypha bisignata* (Selys) : Fraser, *Bull. Inst. Roy. Sc. nat. belg.*, 25 : 16 ; Laidlaw, 1950, *Trans. R. ent. Soc. Lond.*, 101 : 272 ; Montgomery, 1967, *Dt. ent. Zeit.*, 14 : 332.

**Material examined** : 7 exs.; 1 ♂, MAHARASHTRA, Poona, Lonavala, 16.x.1965, coll. B.S. Lamba; 1 ♂, ANDHRA PRADESH, Cuddapa dist., Kodar, 15-18.vii.1929, coll. H.S. Pruthi ; 3 ♂♂, TAMIL NADU; 1 ♂, Sagol Eru stream (5 miles from Diguvametta) foot of Annamalai Hills (E), 21.viii.1929, coll. H.S. Pruthi ; 1 ♂, Silent valley expedition, 25.i.1980, coll. S.K. Bhattacharjee and party; 1 ♂, Karapara expedition, Periyar, Palam, 20.xii.1980, coll. R.S. Pillai and party; 2 ♂♂, KERALA, Kattayam dist., Elappara, 29.xii.1970, coll. A.N.T. Joseph.

**Measurements (in mm) and Nodal index** (for male); Length of abdomen : 19.0-21.0; Length of hindwing : 24.0-26.0; number of antenodal veins : forewing : 12-14; hindwing : 11-15 ; number of postnodal veins : forewing : 24-28, hindwing : 23-27.

**Note** : The species has here been recorded from a number of additional localities of South India.

**Distribution** : India : Maharashtra, Kerala, Tamil Nadu, Andhra Pradesh.

**Rhinocypha hilaryae miaoa** subsp. nov.

(Plate I, Figs. 1 and 2)

**Material examined** : Holotype ♂ and Allotype ♀, INDIA : ARUNACHAL PRADESH : tirap district : Horn bill, ca, 30 kms north east of Miao, 12.xii.1983, coll. S. Biswas and party Registration Nos. 3903/H<sub>13</sub> and 3904/H<sub>13</sub> respectively). Paratypes : 1 ♂, and 2 ♀♀, same data as holotype (Registration Nos. 3905/H<sub>13</sub>, 3906/H<sub>13</sub> and 3907/H<sub>13</sub>).

**Measurements (in mm) and Nodal index** (for males and females respectively); Length of abdomen : 20.0-22.0, 20.0 ; length of hindwing : 24.0-25.0, 27.0-28.0; number of antenodal veins : forewing : 13-15, 12-18; hindwing : 13-15, 11-18; number of postnodal veins : forewing : 24-27, 22-30, hindwing : 22-24, 20-26.

**Note** : The nominate form of this newly proposed subspecies was described from Maymyo in Upper Burma and after a lapse of nearly 40 years it was reported by Asahina (1970) from Putao, situated further north of the type-locality. Asahina (op.cit.) did not mention about any variation of his material from the nominate form and in addition illustration of wing markings provided for his material by Asahina is remarkably similar to that provided by Fraser (1927) thereby indicating that the 'Upper Burma' population of the species is characterised by a reasonably homogenous pattern of body markings, wing colouration and measurements.

The specimens under study however, inspite of their general resemblance to *R. hilaryae* Fraser, differ from its aforementioned Burmese population in a number of important respects in size, body markings and above all the male wing colour pattern in particular. Due to such distinctive features, a new subspecies is established herein to accommodate the present material. *R. hilaryae miaoa* subsp. nov. is briefly described below by indicating its differences from the nominate form.

**Male**

1. Hindwing shorter (24.0-25.0 mm vs 27.0 mm) with but little corresponding variation in the length of abdomen (20.0-22.0 mm vs 21.0-22.0 mm).

2. Labium and labrum black without marking (vs labium black, lateral lobes cream white; labrum azure blue, its anterior border and base narrowly black, that basal black with a median point).

3. Synthorax : with following additional bluish markings on black ground colour ) a fine antehumeral stripe lost or represented just by a broken segment in the upper half; humeral stripe broken to form an isolated segment at upper end; a streak at upper part of 1st lateral suture and a similar but transverse streak along the upper edge of mesepimeron; laterally the major part of mes- and metepimeron bluish but this is longitudinally divided by a broad black stripe running across the 2nd lateral suture (vs laterally an irregular thick interrupted stripe extending the whole length of the thorax, rather zigzagged anteriorly, and broadened into an elongate triangular spot on metepimeron.)

4. Forewing entirely hyaline (vs extreme apices bordered or clouded with black).

5. Apical opaque black mark in hindwing limited to the level of middle of pterostigma (*vs* continued as a narrow border along hind edge of wing for about its apical fourth).

6. Hindwing marked only with two out of three rows of vitreous spots present in *R. h. hiliaryae* Fraser, the one lying between MA and Cu<sub>2</sub> and 'confluent with the narrow opaque black borders' being absent.

7. In hindwing the vitreous spot lying between IR<sub>2</sub> and R<sub>4+5</sub> is much elongated being the longest (*vs* shortest) of the series with inner end lying 6-7 cells proximal (*vs* 6-7 cells distal) to nodus.

8. The opaque black fascia at a short distance proximal to pterostigma in hindwing vestigial.

#### *Female*

1. Hindwing shorter (27.0-mm *vs* 30.0-32.0 mm) with but little corresponding variation in the length of abdomen (20.0 mm *vs* 21.0-22.0 mm).

2. Labium black, unmarked (*vs* marked as in the male).

3. Labrum black, either unmarked (in the allotype) or marked with a pair of large oblong greenish spots (*vs* marked as in the male).

4. Antehumeral stripe on synthorax as in complete as stated for male (*vs* complete).

5. Humeral stripe on synthorax as stated for male above (*vs* incomplete below).

6. Synthorax laterally also marked as stated for male above (*vs* as in male).

*Distribution* : India : Arunachal Pradesh.

### **Rhinocypha ignipennis Selys**

1879. *Rhinocypha ignipennis* Selys, *Bull. Acad. Belg.*, 47 : 389 ; Laidlaw, 1917, 1917, *Rec. Indian Mus.*, 13 : 26, 35 ; Fraser, 1934, *Fauna Brit. India, Odonata*, 2 : 23 ; Cowley, 1937, *Trans. R. ent. Soc., London*, 86 : 4.

*Material examined* : 1 ♂, MEGHALAYA, Khasi hills, Shillong, 15.xi.1930, coll. H.S. Rao.

*Measurements (in mm) and Nodal index* (for male) : Length of abdomen : 22.0 ; length of hindwing : 25.0 ; number of antenodal veins : forewing : 15, hindwing : 14 ; number of postnodal veins : forewing : 35 ; hindwing : 34-36.

*Note* : The single male under study varies from the description of the species provided by Fraser (1934) in respect of length of abdomen.

*Distribution* : India : Meghalaya. Outside India : Burma.

### **Rhinocypha quadrimaculata Selys**

(Plate I, Figs. 3 and 4)

1853, *Rhinocypha quadrimaculata* Selys, *Syn. Cal.*, : 60 ; Fraser, 1934, *Fauna British India, Odonata*, 2 : 14 ; Cowley, 1937, *Trans. R. ent. Soc., London*, 86 : 6 ; Bhasin, 1953, *Indian Forest Leaflet*, 121 : 69 ; Kumar and Prasad, 1977, *Orient. Ins.*, 11 : 551 ; Prasad, 1976, *Rec. zool. Surv. India*, 71 : 100 ; Prasad and Singh, 1976, *Rec. zool. Surv. India*, 70 : 128 ; Lahiri, 1985, *Rec. zool. Surv. India*, 82 : 61.

*Aristocypha quadrimaculata* (Selys) : Laidlaw, 1950, *Trans. R. ent. Soc. London*, **101** : 273; Montgomery, 1967, *Dt. ent. Zeit.*, **14** : 331.

**Material examined** : 106 exs. ; 41 exs., WEST BENGAL, Darjeeling; 39 exs., coll. H. S. Sharma and party; 20 ♂♂, 2 ♀♀, Singla (1 ♂, 13.iv.1973; 16 ♂♂, 8.iv.1973; 3 ♂♂, 20.iv.1973; 2 ♀♀, 7.iv.1973); 1 ♂, 1 ♀, Karmata vill., 19.iv.1973; 9 ♂♂, 6 ♀♀, Rayang, 30.iii.1973; 2 ♂♂, Teesta, 24.v.1979, coll. M. S. Shishodia and party; 33 exs., SIKKIM, Rangpo; 30 exs., coll. P. Halder and party (17 ♂♂, 12 ♀♀, 5.vii.1979; 1 ♂, 6.vii. 1979); 3 exs, coll H. S. Sharma and party (1 ♂, 6.iv.1973, 1 ♂, 9.iv.1973, 1 ♀, 7.iv.1973); 7 ♂♂, HIMACHAL PRADESH, Mandi, river side, 23.ix.1980, coll. H. K. Bhowmik and party; 7 exs., MANIPUR; 3 exs., Moreh, coll. P.T. Cherian and party (1 ♂, Lockchou river bank, 22.ii.1975, 2 ♂♂, near forest office, 24.ii.1975); 4 exs., coll. M.S. Shishodia and party (1 ♂, Burma border east, alt. 2000 m., 21.ix.1975, 3 ♂♂, Moreh, alt. 2000 m., 25.ix.1975); 18 exs., ARUNACHAL PRADESH ; 16 exs., Tirap district ; 13 exs., Namdhapa, coll. S. Biswas and party; 1 ♂, Gibbons land, 10 kms post on Miao Vijaynagar road, 2.iv.1981; 10 ♂♂, 2 ♀♀, Miao (4 ♂♂, 2 ♀♀, 30.xi.1982, 3 ♂♂, 1.xii.1982, 2 ♂♂, 3.xii.1982, 1 ♂, 4.i.1983); 1 ♂, 2 ♀♀, Nampong camp, alt. 350 m., 28.x.1971, coll. G. S. Arora and party; 1 ♂, on way to Mori, Upper Subansiri district, 25.x.1981, coll. S.K. Gupta and M. Prasad; 1 ♂, Kameng division, Denling, alt. 229 m., 5.v.1966, coll. A.N.T. Joseph; 17 ex., WEST BENGAL, coll. H.S. Sharma and party; 3 ♂♂, 5 ♀♀, 1 km. west of Forest Rest House, Reyang, 30.iii.1973; 6 ♂♂, 2 ♀♀, 4 kms. southeast of Goke Forest Rest House, Singla, 7-20.iv.1973.

**Measurements (in mm) and Nodal index** (for males and females respectively); Length of abdomen : 17.0-21.0, 16.0-20.0 ; length of hindwing : 19.0-25.0, 24.0-28.0; number of antenodal veins : forewing : 15-25, 16-22; hindwing : 13-21, 12-18; number of postnodal veins : forewing : 26-41, 24-33, hindwing : 23-40, 20-30.

**Note** : In general built, body and wing markings *R. quadrimaculata* Selys closely resembles *R. spuria* Selys. As pointed out by Fraser (1934), the minor differences in respect of thoracic markings between the two species also are inconsistent because "General specimens (of *R. quadrimaculata*) have markings very similar to those of *R. spuria*" Fraser (Loc. cit.) stressed on a few points (p. 14) to serve as distinctive features between the two species. But a careful study of a fairly large collection of *R. quadrimaculata* Selys under study shows that such characters are also variable and overlapping or nearly so between the two species as would be evident from measurements of body parts and nodal index recorded here for the two species. The nature of the apical vitreous spot of hind wing of *R. quadrimaculata* Selys male is also variable in the specimens studied in being square or elongated in shape and overlapping IR<sub>3</sub> by 1 or 2 cells on posterior margin.

Presence of considerable infraspecific variation in the population of same locality (Figs. 3 and 4; Table 1) rules out the possibility of such variation conditioned geographically. However, effect of season, in this respect, can not be properly judged since, the available material does not contain seasonal representative all round the year from any of the localities.

*R. quadrimaculata* Selys is however a smaller species than *R. spuria* Selys. The two species constantly differ from each other in the following points as is evident from present study : (i) abdomen in male is never more than 21.0 mm. in

*R. quadrimaculata* Selys but always more than 23.0 mm. in *R. spuria* Selys; (ii) *R. spuria* Selys have a wider mesothoracic triangle than *R. quadrimaculata* Selys (0.75 mm. vs 0.50 mm. and 0.50 mm. vs 0.25 mm. for males and females respectively at about middle); (iii) *R. spuria* Selys also have a longer discoidal cell and longer median space than *R. quadrimaculata* Selys (Table I).

This is the first record of occurrence of this species in the states of Arunachal Pradesh and Manipur of Indian union.

**Distribution** : India : Arunachal Pradesh, Assam, Himachal Pradesh, Kashmir, Manipur, Sikkim, Uttar Pradesh, West Bengal. Outside India : Burma, Nepal.

### **Rhinocypha spuria Selys**

1879. *Rhinocypha spuria* Selys, *Bull. Acad. Belg. (2)*, 47 : 388 ; Fraser, 1934, *Fauna Brit. India, Odonata*, 2 : 12 ; Cowley, 1937, *Trans. R. ent. Soc., London*, 86 : 6 ; Bhasin, 1953, *Indian Forest leaflet*, 121 : 69.

1950. *Aristocypha spuria* (Selys) : Laidlaw, *Trans. R. ent. Soc., London*, 101 : 273.

**Material examined** : 5 exs., ARUNACHAL PRADESH, Tirap district, namdhapa, Miao, coll. S. Biswas and party (3 ♂♂, 30.xi.1982, 2 ♀♀, 1.xi.1982).

**Measurements (in mm) and Nodal index** (for males and females respectively); Length of abdomen : 23.0-24.0, 18.0 ; length of hindwing : 26.0-28.0, 27.0 ; number of antenodal veins : forewing : 16-22, 16-18; hindwing : 16-23, 14-15; number of postnodal veins : forewing : 29-44, 14-15; hindwing : 30-41, 22-26.

**Note** : The species has here been recorded for the first time from Arunachal Pradesh.

**Distribution** : India : Arunachal Pradesh, Meghalaya, Nagaland. Outside India Burma.

### **Rhinocypha trifasciata Selys**

1853. *Rhinocypha trifasciata* Selys, *Syn. Cal.* : 61 ; Laidlaw, 1917, *Rec. Indian Mus.*, 13 : 25, 34 ; Fraser, 1934, *Fauna Brit. India, Odonata*, 2 : 31 ; Cowley, 1937, *Trans. R. ent. Soc., London*, 86 : 6 ; Bhasin, 1953, *Indian Forest Leaflet*, 121 : 69 ; Singh and Prasad, 1976, *Orient. Ins.*, 10 : 553 ; Kumar and Prasad, 1977, *Orient. Ins.*, 11 : 549 ; Prasad and Singh, 1976, *Rec. zool. Surv. India*, 70 : 129.

1879. *Rhinocypha bifasciata* Selys, *Bull. Acad. Belg. (2)*, 57 : 386 ; Fraser, 1934, *Fauna Brit. India, Odonata*, 2 : 29.

**Material examined** : 4 exs.; 2 ♂♂, UTTAR PRADESH, Garhwal district, jarmola to Naitwar, coll. D. R. Mondal, 25.ix.1972; 1 ♂, HIMACHAL PRADESH, Solan, Patror, coll. O. B. Chhotani and G.S. Arora, 4.ix.1969; 1 ♂, JAMMU, Udampur district, Kata Nala, coll. Raj Tilak, 20.xi.1964.

**Measurements (in mm) and Nodal index** (for male) : Length of abdomen : 23.0; length of hindwing : 27.0 ; number of antenodal veins : forewing : 19-25½ ; hindwing : 19-23; number of postnodal veins : forewing : 34-37; hindwing : 31-34.

**Note** : The species has here been recorded for the first time from Jammu and Kashmir state of the Indian union.

**Distribution** : India : Himachal Pradesh, Jammu and Kashmir, Uttar Pradesh, West Bengal.\*

### **Rhinocypha unimaculata** Selys

1853. *Rhinocypha unimaculata* Selys, *Syn. Cal.*, : 61 ; Laidlaw, 1917, *Rec. Indian Mus.*, 13 : 26, 35 ; Fraser, 1934, *Fauna British India, Odonata*, 2 : 27 ; Cowley, 1937, *Trans. R. ent. Soc., London*, 86 : 4 ; Bhasin, 1953, *Indian Forest Leaflet*, 121 : 69 ; Jumar, 1973, *Orient. Ins.*, 7 : 94 ; Prasad and Singh, 1976, *Rec. zool. Surv. India*, 71 : 129.

1949. *Paracypha unimaculata* : (Selys) Fraser, *Bull. Inst. Roy. Sc. nat. Belg.*, 25 : 11 ; Laidlaw, 1950, *Trans. R. ent. Soc., London*, 101 : 272 ; Montgomery, 1967, *Dt. ent. Zeit.*, 14 : 332.

**Material examined** : 21 exs.; 11 exs., WEST BENGAL : Darjeeling, coll. H.S. Sharma and party; 9 exs., Singla : 1 ♂, 16.iv.1973; 5 ♂♂, 18.iv.1973; 3 ♂♂, 19.iv.1973; 2 ♂♂, Teesta, 24.v.1973; 6 ♂♂, 3 ♀♀, SIKKIM, Rangpo, 5.vii.1979, coll. P. Halder and party ; 1 ♂, UTTAR PRADESH, Kumaon hills, Almora district, 29.v.1930, coll. H.S. Prathi.

**Measurements (in mm) and Nodal index** (for males and females respectively); Length of abdomen : 21.0-28.0, 22.0 ; length of hindwing : 28.0-33.0, 30.0-32.0 ; number of antenodal veins) forewing : 15-22, 17-22 ; hindwing : 15-22, 15-20 ; number of postnodal veins : forewing : 32-48, 31-38 ; hindwing : 32-44, 30-37.

**Note** : The males under study vary from the description of the species provided by Fraser (1934) in having longer abdomen and hindwing.

This is the first record of occurrence of this species in Sikkim state of the Indian union.

**Distribution** : India : Sikkim, Uttar Pradesh, West Bengal. Outside India : Nepal

## SOME NOTES ON THE DISTRIBUTION OF INDIAN CHLOROCYPHID SPECIES

(Table II)

Montane and submontane areas with subtropical or temperate vegetation appears to be the preferred habitat of Chlorocyphid species in general. Majority (nearly 80% of the total) Indian representative of the family are noticed to be distributed either in the foothills of the Himalayas or the states of Eastern India - but in contrast, plains of Northern India is practically devoid of any Chlorocyphid fauna. Peninsular India and the Andaman and the nicobar islands possess their own exclusive species composition which however, accounts for a rather insignificant part (12½% and 8% respectively) of the total Chlorocyphid fauna of the Indian union. One of the South Indian species is known also from Ceylon while out of the 19 species known from North India two extend to Tibet, two to Nepal and eight to Burma or other Indo-Chinese countries. Out of these eight species one extends as far as Malay peninsula and another right upto Indonesia. Distribution of some species, e.g. those belonging to Sl. No. 6, 9 and 21 is patchy or discontinuous. *Rhinocypha quadrimaculata* Selys appears to be the most widely distributed Chlorocyphid species in North India while *R. bisignata* Selys is so in South India.

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\*Its earlier record of distribution in Assam is erroneous because the actual locality 'Gopaldhara' is situated in (northern) West Bengal.



	<i>Rhinocypha quadrimaculata</i> Selys													<i>Rhinocypha spuria</i> Selys.				
	ex. 1	ex. 2	ex. 3	ex. 4	ex. 5	ex. 6	ex. 7	ex. 8	ex. 9	ex. 10	ex. 11	ex. 12	Mean	ex. 1	ex. 2	ex. 3	Mean	
Median space	♂	2.6	2.8	2.5	2.6	3.0	2.6	2.5	3.0	3.2	3.0	2.9	2.8	2.79	3.6	3.5	3.0	3.36
	♀	2.7	2.7	2.7	2.7	2.43	2.61	3.78	2.7	2.88	2.7	2.25	2.7	2.73	3.06			2.83
Discoidal cell	♂	2.0	2.1	2.3	1.7	2.5	2.3	1.9	2.2	2.3	2.2	2.3	2.2	2.17	2.9	2.7	2.5	2.70
	♀	1.98	1.8	1.98	1.89	1.98	1.53	2.16	2.07	2.16	2.07	1.71	1.98	1.94	2.07	2.07		2.07
Hind wing	♂	19.0	22.0	25.0	24.0	24.0	23.0	24.0	22.0	23.0	24.0	23.0	24.0	23.08	28.0	28.0	26.0	27.33
	♀	26.0	27.0	24.0	28.0	26.0	27.0	30.0	27.5	26.0	24.0	27.0	27.0	26.87	27.0	27.0		27.0
Abdomen	♂	21.0	17.0	21.0	20.0	20.0	21.0	20.0	21.0	18.0	19.0	20.0	20.0	19.83	23.0	24.0	23.0	23.33
	♀	20.0	20.0	16.0	22.0	19.0	18.0	20.0	20.0	18.0	18.0	18.0	19.0	19.0	18.0	18.0		18.0

Table II. Comparative measurements of body parts (in mm) of *Rhinocypha quadrimaculata* Selys and *R. spuria* Selys.

*R. quadrimaculata* Selys = Moreh, Feb. 75 (♂ exs. 1 and 2); Darjeeling district : Reyang, November, 1973 (♂ exs. 5,9,12; ♀ exs. 1,2,6,7,12); Singla, April, 1973 (♂ exs. 3,4,6,7,8,10,11; ♀ exs. 4,11); Sikkim : Rongpo, July, 1979 (♀ exs. 5, 11); Tirap district : Nampong, October, 1971 (♀ exs. 5, 10); Miao, November, 1982 (♀ ex. 3).

*R. spuria* Selys = Tirap district : Maa, November, 1982 (♂ exs. 1,2,3; ♀ exs. 1,2).

Serial No.	Name of the species	INDIA					And. & Nic. Is.	OUTSIDE INDIA
		S. India	North India					
			Himalayas					
			Western (J. & K.)	Central (U.P., H.P.)	Eastern (N. Beng., Sik., Ar. Pr.)	Rest of North India		
1.	<i>Calocypha laidlawi</i> Fraser	+	-	-	-	-	-	
2.	<i>Chlorocypha vittata</i> (Selys)	-	-	-	-	Mizoram	Burma	
3.	<i>Libellago lineata andamanensis</i> Fraser	-	-	-	-	-	+	
4.	<i>L. I. blanda</i> (Selys)	-	-	-	-	-	+	
5.	<i>L. I. indica</i> (Fraser)	+	-	-	-	Madhya Pradesh	Ceylon	
6.	<i>L. I. lineata</i> (Burmeister)	-	+	-	-	Assam, Manipur	Burma, Thailand, Vietnam, Malay peninsula, Borneo, Indonesia	
7.	<i>Rhinocypha beatifica</i> Selys	-	-	-	-	Nagaland Meghalaya	-	
*8.	<i>R. biforata abbreviata</i> Fraser	-	-	-	-	? Assam	-	
*8.	<i>R. b. beelsoni</i> Fraser	-	+	-	-	Assam	Burma	
*10.	<i>R. b. delinbata</i> Selys	-	-	-	-	Assam, Manipur, Meghalaya	Burma, Vietnam	
11.	<i>R. bisignata</i> Selys	+	-	-	-	-	-	
***12.	<i>R. cuneata</i> Selys	-	-	-	+	-	Tibet	
**13.	<i>R. fenestrella</i> Rambur	?	?	?	?	?	Burma, Indonesia	
14.	<i>R. hilaryae miaoa</i> subsp. nov.	-	-	-	+	-	-	
15.	<i>R. ignipennis</i> Selys	-	-	-	-	Meghalaya	Burma	
16.	<i>R. i.n.naculata</i> Selys	-	-	-	-	Meghalaya	-	
*17.	<i>R. perforata li.nbata</i> Selys	-	-	-	-	? Assam	Burma, Malay Peninsula	
18.	<i>R. quadri.naculata he.nihyalina</i> Fraser	-	-	-	-	Meghalaya ? Nagaland	-	
19.	<i>R. q. quadri.naculata</i> Selys	-	+	+	+	Assam, Manipur, Meghalaya	Bruma, Nepal	
20.	<i>R. spuria</i> Selys	-	-	-	+	meghalaya, Nagaland	Burma	
***21.	<i>R. trifasciata</i> Selys	-	+	-	+	-	-	
22.	<i>R. tri.naculata</i> Selys	-	-	-	-	Assam	Tibet	
*23.	<i>R. unimaculata</i> Selys	-	+	-	+	-	Nepal	
24.	<i>R. vitrinella</i> Fraser	-	-	-	-	Assam, Meghalaya	-	

Table II. Chart showing distribution of Indian Chlorocyphid Species.

\* Recorded from erstwhile 'Assam' Province—hence exact distribution in the newly erected states out of said province uncertain.

\*\* Fraser (1934) recorded this species from India on the strength of a specimen present in British Museum collection without a specific locality record.

\*\*\* Earlier record of distributio in 'Assam' is erroneous since the actual locality 'Gopaldhara' is situated in the Darjeeling district of West Bengal.

## SUMMARY

The known Chlorocyphid species from the Indian union have been listed together with illustration of the comparative features of *Rhinocypha quadrimaculata* Selys and *R. spuria* Selys, description of a new subspecies viz. *R. hiliaryae miaoa* and additional records of distribution for *Libellago I. indica* Fraser, *L. I. lineata* (Burmeister), *R. bisignata* Selys, *R. ignipennis* Selys, *R. q. quadrimaculata* Selys, *R. spuria* Selys, *R. trifasciata* Selys, *R. unimaculata* Selys.

## ACKNOWLEDGEMENT

The authors are thankful to the Director, Zoological Survey of India for providing an opportunity to carry out the present study and to Late Dr. M.A. Lieftinck for his considered opinion on the identification of some of the species dealt with in this paper.

## LITERATURE CITED

- Bhasin, G.D. 1953. Odonata, in Roonwal *et.al.* A systematic catalogue of the main identified collections of the Forest Research Institute, Dehradun. Parts 9-21. *Indian Forest Leaflet*, **121**(3) : 43-69.
- Chhotani, G., Lahiri, A.R. and Mitra, T.R. 1983. Contribution to the odonate (Insecta) fauna of the Andaman and Nicobar islands with description of two new species. *Rec. zool. Surv. India*, **80** : 467-494.
- Cowley, J. 1937. The penes of Chlorocyphidae as a group characters. *Trans. R. ent. Soc., London*, **86** : 1-18.
- Fraser, F.C. 1933, 1934. *Fauna of British India, Insecta : Odonata. 1* : xiii + 418 pp., figs., **2** : xix + 398 pp., Figs. and 4 pls. *Taylor and Francis*, London.
- Fraser, F.C. 1949. A revision of the Chlorocyphidae with notes on the differentiation of the Selysian species *rubida*, *glauca*, *cyanifrons* and *curta*. *Bull. Inst. R. Sci. nat. Belg.*, **25** : 1-50.
- Fraser, F.C. 1957. A reclassification of the order Odonata. 133 pp. *Royal Zoological Society of New South Wales, Sydney*.
- Kiauta, B. 1975. Cytotaxonomy of dragonflies with special reference to Nepalese fauna. × + 74 pp., 42 figs. *Netherlands Centre for Alpine Biological Research, Utrecht*.
- Kumar, A. 1973. A descriptions of the last instar larvae of Odonata from Dehra Dun valley (India) with notes on biology I. Suborder Zygoptera. *Orient. Ins.*, **7** : 85-118.
- Kumar, A and Prasad, M. 1977. On the larva of *Rhinocypha* (Odonata Chlorocyphidae) from Garhwal hills. *Orient. Ins.*, **11** : 547-554.
- Kumar, A. and Prasad, M. 1981. Field ecology, Zoogeography and Taxonomy of the Odonata of Western Himalaya, India, *Rec. zool. Surv. India*, Occ. pap. No. 20, 118 pp., figs.

- Lahiri, A.R. 1977. New records of Odonata from Tripura and Arunachal Pradesh. *Proc. zool. Soc., Calcutta*, **30** : 45-49.
- Lahiri, A.R. 1979. Odonata (Insecta) from different states of North Eastern India. *Orient. Ins.*, **13** : 119-132.
- Lahiri, A.R. 1985. Fauna of Namdhapa wildlife Sanctuary, Arunachal Pradesh, India. Insecta : Odonata. *Rec. zool. Surv. India*, **82** : 61-67.
- Lahiri, A.R. and Sinha, C. 1985. A new synonym in Indian *Rhinocypha* Rambur, with a review of the species groups *Fenestrella* and *Bifasciata* (Odonata : Chlorocyphidae). *Rec. zool. Surv., India*, **7** : 33-36.
- Lahiri, A.R. 1987. Studies on the Odonate fauna of Meghalaya. *Rec. zool. Surv., India*, Occ. Fap. No. 99, 402 pp., 539 figs., 14 maps.
- Laidlaw, F.F. 1917. A list of the dragonflies recorded from the Indian empire with special reference to the collection of the Indian Museum. Part I. Family Chlorocyphidae. *Rec. Indian Mus.*, **13** : 23-40.
- Laidlaw, F.F. 1950. A survey of Chlorocyphidae (Odonata : Zygoptera) with diagnosis of proposed new genera and description of a new geographical subspecies. *Trans. R. ent. Soc., London*, **101** : 257.
- Montgomery, B.E. 1967. The family and genus group names of Odonata. 1. Calopterigoidea. *Dt. ent. Zeit.*, **14** : 327-337.
- Prasad, M. 1976. Odonata of district kangra (Himachal Pradesh). *Rec. zool. Surv. India*, **71** : 95 : 119.
- Prasad, M and Singh, A. 1976. Odonata of Doon valley. 2. Zygoptera. *Rec. zool. Surv. India*, **70** : 121-131.
- Rao, K.R. and Lahiri, A.R. 1983. First records of Odonates (Arthropoda : Insecta) from the Silent valley and New Amarambalam Reserved forests. *J. Bombay nat. Hist. Soc.*, **79** : 557-562.
- Singh, A. and Prasad, M. 1976. On the identity of *Rhinocypha trifasciata* and, *R. bifasciata* (Odonata : Zygoptera : Chlorocyphidae). *Orient. Ins.*, **10** : 553-556.