

A NEW SYNONYM IN INDIAN *RHINOCYPHA* RAMBUR, WITH A REVIEW
OF THE SPECIES-GROUPS *FENESTRELLA* AND *BIFASCIATA*
(ODONATA : CHLOROCYPHIDAE)

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ABSTRACT

R. bifenestrata Fraser is considered a synonym of *R. cuneata* Selys upon a review of the characters of the species groups 'Fenestrella' and 'Bifasciata' under the genus *Rhinocypha* Rambur.

Rhinocypha cuneata Selys originally described from Tibet, is now known to have a wider distribution in Eastern Himalaya, e. g. Mungpoo and Turzum in the Darjeeling district, Gopaldhara in Assam (Fraser, 1934) and Siki and Tablia in Arunachal Pradesh (Lahiri, 1977, 1979). Subsequently Fraser (1922) described another species *R. bifenestrata* from Mungpoo.

While going through a fairly large collection of *R. cuneata* Selys from different parts of north Bengal and Arunachal Pradesh, a range of gradations was observed in the distinctive features laid down by Fraser (1934) for separating the two species. A comparative study shows that, *bifenestrata* Fraser is only a synonym of *R. cuneata* Selys.

Analysis of the species-'group' characters under the genus Rhinocypha Rambur.

Fraser (1934) in his "Key to the Indian species of *Rhinocypha*" used the nature of hind wing markings for distinguishing the set of two species groups, 'Fenestrella' and 'Bifasciata'. However, a close look at various characters separating the groups leads one to believe that Fraser incorporated his species *bifenestrata* within the 'Bifasciata' group on rather superfluous grounds, since, a reasonable analysis of the character presented by this species clearly indicates its closer affinity to 'Fenestrella' group.

In this connection, it would be worthwhile to summarize the characters used by

	<i>Fenestrella</i> -group (<i>R. cuneata</i> Selys and its allies)	<i>Bifasciata</i> -group (<i>R. bifenestrata</i> Fraser and its allies)
1. Origin of R_s	At subnode	At or slightly distal to subnode
2. Wings markings	Opaque black with iridescent vitreous spots of blue, violet or emerald green	Hyaline or hind wing marked with one or more opaque black bands running from costa to hinder border.
3. Comparative broadness of wings	Hindwings considerably broader than forewings	Hind wings only slightly broader than forewings

Fraser (1934) to distinguish the two species groups mentioned above :

Amongst such distinguishing characters, the origin of R_s is clearly overlapping in nature and do not therefore, serve any useful purpose in distinguishing the two species groups. In respect of wing markings it is noticed that, while the members of *Fenestrella* group conform with each other in having a general common pattern, the members of *Bifasciata* group present a wide range of distinction in this respect. Thus, while the wings are completely hyaline in *immaculata* Selys, in *hilarye* Fraser, *trifasciata* Selys* and *bifenestrata* Fraser the wings are distinguished into hyaline (near bases) and vitreous violet (or violet-green or emerald-green) areas, such vitreous areas being marked by black bands. Such black bands in case of *hilarye* Fraser and *trifasciata* Selys are present only in hind wing, rather narrow, and are either isolated from or partially joined to one another by narrow isthmus running only along either the costal or the inner wing border. In *bifenestrata* however, nature of the black area is altogether different. Not only the forewings in case of *bifenestrata* are heavily marked with black, but in hind wing also, the black areas are so extensive and broadly contiguous along costal as well as inner wing border that, the vitreous areas are reduced to isolated areas or spots. One thus finds it difficult to regard the black markings in the wings of *bifenestrata* as 'bands'—the only key character (couplet 3, p. 8) used by Fraser (1934) to distinguish the set of species of the two groups, '*Bifasciata*' and '*Fenestrella*'.

Taking into consideration the nature of wing markings of *bifenestrata* as stated by

Fraser (1934) on one hand and that of the different species of the *Fenestrella* group on the other, it is further noticed that *bifenestrata* Fraser indeed shows a keen similarity with *cuneata* Selys in this respect. Their closeness was also perceived by Fraser (1934), who (on p. 33) wrote that "This species" (i.e. *R. bifenestrata*) "is, I think, more nearly related to *R. cuneata* than to *R. bifasciata*".

Regarding comparative broadness of fore and hind wings, Fraser (*loc. cit.*) did not provide any morphometric data for the various species groups proposed by him under the genus *Rhinocypha* Rambur. However, in the figures of the wings of the two species provided by the author it is noticed that the fore and hind wings measures respectively 21 mm and 24 mm in case of *R. cuneata* Selys (Fig. 3, p. 10) and 22 mm and 23 mm in case of *R. bifenestrata* Fraser (Fig. 11, p. 34). It shows thereby that, the fore and hind wings are almost similar in width in case of *bifenestrata*, but in *cuneata* the hind wings are a shade wider than forewings (in the ratio of 7 : 8).

In summing up the foregoing discussion of the species 'group' and 'key' characters, it may be said that, one fails to make any sound distinction between *R. cuneata* Selys and *R. bifenestrata* Fraser upon such characters in as much as placing them in different species "groups". Both species judged reasonably obviously belong to one and the same species group i. e. *Fenestrella*-group.

Material examined : 42 exs ; 41 exs, ARUNACHAL PRADESH ; 23 exs, Siang division ; 21 exs, coll. S. K. Tundon & G. S. Arora ; 3 ♂♂, Tappi, 23. x. 1966 ; 2 ♂♂, 1 ♀, Dali village, 10. x. 1966 ; 2 ♂♂, Dulla,

* *R. bifasciata* Selys, another member of the *Bifasciata*-group mentioned by Fraser (1934) has since been suppressed under *R. trifasciata* Selys by Singh and Prasad (1976.)

29.x.1966 ; 3 ♂♂, Pading village, 11.x.1966 ; 4 ♂♂, 4 ♀♀, Bame village, 30.x.1966 ; 2 ♂♂, Dali Camp, 12.x.1966 ; 2 ♂♂, coll. **S. K. Gupta & M. Prasad** : 1 ex, on way to Bólung, 21.x.1981 ; 1 ♂, Basar, 23.x.1981 ; 14 exs, Subansiri district ; 5 exs, 28.x.1966, coll. **S. K. Tandon & G. S. Arora** : 3 ♂♂, Bidae ; 1 ♂, 1 ♀, Daporijo ; 7 exs, coll. **A. N. T. Joseph** : 1 ♂, Tipi, 6.v.1966 ; 3 ♂♂, 3 ♀♀, Tamen, 18-20.v.1966 ; 2 ♂♂, on way to Mori, Upper Subansiri district, 25.x.1981, coll. **S. K. Gupta & M. Prasad** ; 2 ♂♂, Pinjuli, Kamang division, 4.v.1966, coll. **A. N. T. Joseph** ; 1 ♂, 1 ♀, Wakro, Lohit dist. Daphabum Expedition, 1-3.xii. 1969-70, coll. **J. M. Julka** ; 1 ♂, WEST BENGAL, Reyang, 30. v. 1972, coll. **H. S. Sharma & Party**.

Measurements (in mm) and Nodal index : (for males and females respectively) ; Length of abdomen : 18.0-24.0, 17.5-21.0 ; length of hind wing : 23.0-30.0, 25.0-32.0 ; number of antenodal veins : fore wing : 15-23, 15-21 ; hind wing : 14-23, 17-20 ; number of postnodal veins : fore wing : 29-50, 26-34, hind wing : 27-43, 24-34.

Observations in respect of characters of taxonomic importance.

The nature of various characters of taxonomic importance exemplified in the specimens of *R. cuneata* Selys under study are presented below with an attempt to show how these intergrade between the descriptions of *R. cuneata* Selys and *R. bifenestrata* Fraser, provided by Fraser (1934).

Markings of forewing : Opaque area of forewings in the specimens studied shows a complete gradation from being very extensive (Plate I, figs. 3 & 4) like that of *R. cuneata* Selys (covering costal half or more than that in extent) to less than costal half (Plate I, fig. 2)

and falling to narrow isthmus apical to pterostigma and following some distance from node to pterostigma (Plate I, fig. 1) as that of *bifenestrata* Fraser. Due to variability of its extensiveness the opaque area of forewing is in some specimens limited posteriorly by IR_{4+5} (Plate I, 2) or R_{4+5} (Plate I, fig. 4), but in others, the opaque area extends upto MA (Plate I, fig. 1).

Extent of opaque area in hind wing : Fraser (1934) mentioned in the description of the two species that in hind wing, the opaque area extends 4-5 cells proximal to node in *R. cuneata* Selys, while the same extends 3-4 proximal to node in *R. bifenestrata* Fraser. In the specimens under study, however, it is observed that the opaque area in hind wing extends based variably upto only node (Plate I, figs. 2 & 3) or upto 5 cells (Plate I, fig. 1) proximal to that level in costal space.

Nature of preapical vitreous spot in hind wing : As described by Fraser (1934), the preapical spot in hindwing of *R. cuneata* Selys is oval, narrower than the middle row of vitreous spots and with its outer border in line with inner border of pterostigma. Although Fraser (*loc. cit.*) stated the nature of the pre-apical vitreous spot to be variable in *R. bifenestrata* Fraser, in the figure of wings of the species provided by the author it is found that the pre-apical spot is as wide as the middle row of vitreous spots. In the specimens under study (Plate I, figs. 1 to 4) we notice an intermediate situation in respect of the relative width of the pre-apical spot while its outer border is found to lie variably along the inner end of pterostigma or proximal to that level.

Nature of Medial row of vitreous spots : In the specimens at our disposal it is noticed that of the medial row of vitreous spots, the costal is usually separated from the two

posterior ones (Plate I, figs. 1, 3 and 4), but all three may also be isolated (Plate I, fig. 2). Here again we find a gradation of situation linking *R. cuneata* Selys and *R. bifenestrata* Fraser.

Relative breadth of fore and hind wings : In a random sample of 10 exs. of specimens under study the relative breadth of fore and hind wing are found to be as follows : 7.0 : 6.0 (2 exs) ; 7.0 : 7.5 (1 ex) ; 7.0 : 7.7 (4 exs) ; 7.0 : 8.0 (3 exs). Therefore, the specimens at our disposal also present variable situation in respect of relative width of fore and hind wings grading into the ideal conditions of *R. cuneata* Selys and *R. bifenestrata* Fraser.

Conclusion : From the foregoing analysis of species group characters and observations in respect of characters of taxonomic importance, it becomes amply clear that *bifenestrata* Fraser can not hold a distinct identity and therefore, for fitness of things it is sunk as a synonym under *R. cuneata* Selys. However, some amplification of the existing description of *R. cuneata* Selys appear worth recording. Over and above what has already been discussed in connection with the characters of taxonomic importance, the specimens studied also present some variations in respect of body markings. Thus, labrum does not bear any marking in the specimens studied and in most of them, the hind femora are not pruinosed. The details of thoracic marking in the specimens studied differ in details from the description of either species as provided by Fraser (1934) and stand as follows : Male—Mesothoracic triangle blue, large and complete, extending as far as antecubital sinus ; a posthumeral line, incomplete below and broken above to part with a small isolated upper spot ; a small upper spot just above the humeral suture ; a line on 1st lateral suture, of about half the length of post humeral line, and narrowly separated from a linear streak bordering the

upper margin of mesepimeron ; some or all the foregoing markings are subject to being reduced or obsolete ; a broad stripe largely covering the mesepimeron and a triangular stripe over the upper part of metepimeron ; a short fine anterior streak representing the antehumeral stripe of the female rarely present. Female : Markings very similar to the male, but are better defined ; the posthumeral line not broken and the upper antehumeral spot expanded into a narrow streak curved towards the antecubital sinus ; in addition, a fine antehumeral line is present that extends backwards from the anterior end for variable distance.

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