

NOTES ON SOME TYPES OF INDIAN BLEPHAROCERIDAE.

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Only six species of Indian Blepharoceridae; *Blepharocera indica* Brunn., *Apistomyia trilineata* Brunn., *Philorus bionis* Aghark., *Eliponeura horai* Tonn., *E. assamensis* Tonn. and *Horaia montana* Tonn. have so far been made known, although many species are present in this country as is evidenced by the fine collection of larvae made by Dr. S. L. Hora, on which I reported in this Journal some time ago.¹

As mentioned in that paper the three older species, described by Brunnetti and Agharkar, were not well defined and in order to be able to recognize them from among the many forms, that are bound to be found one day, a study of the types seemed advisable.

Dr. S. Pruthi kindly consented to send me on loan from the collection of the Zoological Survey of India the types and paratypes of *Blepharocera indica* and *Philorus bionis* for revision. I am very much indebted to him for this and wish to express to him my very best thanks. The types of the remaining species, *Apistomyia trilineata*, were not in sufficiently good condition to travel by post. However, as both specimens named by Brunnetti were females and as in this genus specimens of this sex afford but very few differentiating characters, it is probable that very little information would have been gained in studying them.

***Blepharocera indica* Brunn.**

The type material consists of two pinned female specimens both from Phagu, 9,000 feet, Simla Hills, 14-15.v.09, Annandale; they are both in fairly good condition and belong evidently to the same species.

The head of the type was so crumpled that the structure of the eye could not be made out. The head was, therefore, treated in potash in order to restore it to its former size and aspect; it is shown in Fig. 1. It is similar to that of *Bleph. fasciata* Westw., but it differs in a very important point. The so-called "bare band" which separates the two portions of each eye is dark brown and shining (before treatment in KOH). At first glance it is indistinguishable from the lower small faceted portion on account of its dark colouration. The surface of this band is very minutely but densely pubescent and its aspect is markedly different from that of the face, which is grey pruinose, and hairy only on a small swelling a little below the base of the antennae.

The mouth parts are as long as the height of the head, the last four segments of palpi subequal to each other, the mandibles scarcely protruding.

Antennae 15-segmented, the two basal segments and base of the third more or less orange, the rest brown. Mesonotum shining brown

¹ *Rec. Ind. Mus.* XXXII, pp. 161-214 (1930).

with two faint narrow greyish vittae converging at the back and fusing in front of the scutellum, which is ochraceous, as also are the pleuræ

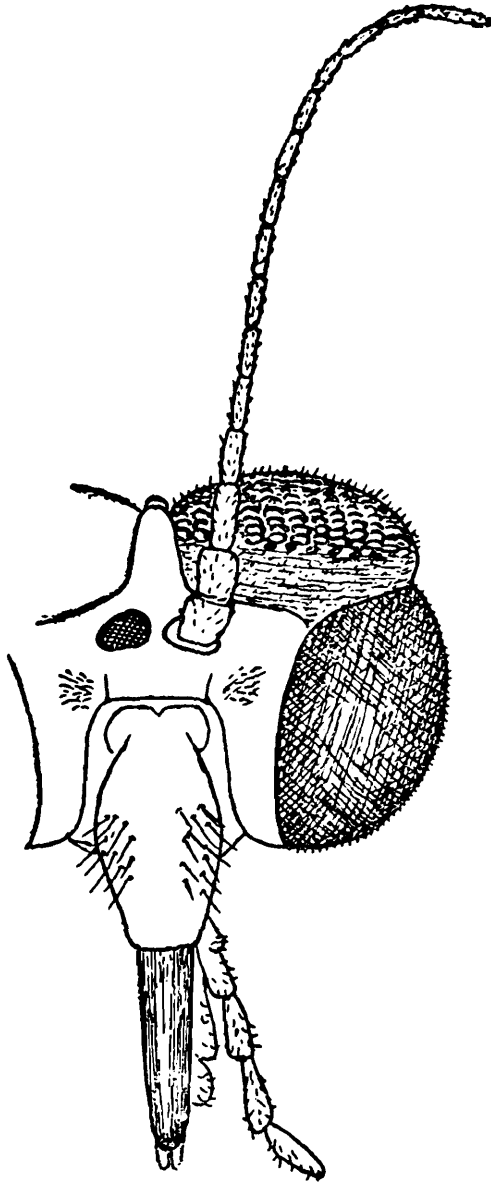


Fig. 1.—Head of female of *Blepharocera indica* Brunn. (type).

and postnotum. Legs, including the coxæ, ochraceous orange ; their relative measurements are as follows :—

Leg.	Femora.	Tibiae.	Tarsi.				
			I	II	III	IV	V
I	55	45	25	10	5	3.5	5
II	56	45	23	10	5	4	5
III	74	65	27	8	4	3	4

The mid-coxæ have a small internal hairy process as shown in Fig. 2 ; so far as I know this structure is unique in the genus. The trochanters of the mid-coxæ are more hairy than usual. There is only one small bare apical spur on the hind tibiae, none on the mid tibiae ; the tarsal claws are simple, without bristles, but the hind metatarsi have a very small, but yet distinct, basal tuft of black bristles below. Wing venation



Fig. 2.—Base of mid-leg of *Blepharocera indica* Brunn.

as shown in Fig. 3 (paratype); the halteres with orange stem and brownish knob. Abdomen dull brown, base of tergites paler and somewhat pruinose on the sides. Genitalia as shown in Fig. 4; the end lamellae very pale and reinforced with dark chitinous armatures; subgenital plate deeply cleft.

The examination of this type shows that this species is quite distinct from *Bleph. fasciata*, a race of which has recently been discovered by K. Brodsky in Central Asia. The main points of difference are: the dark shiny band dividing the two portions of each eye, the peculiar process of the mid-coxae and the shape of the subgenital plate, whose lobes are much

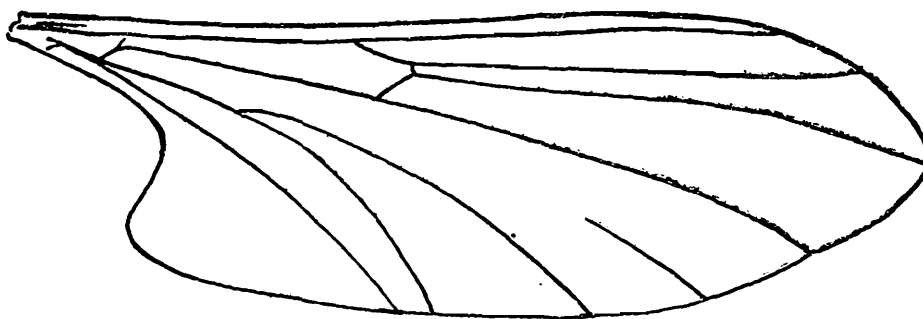


Fig. 3.—Venation of *Blepharocera indica* (paratype).

broader and much more rounded on the sides than those of *B. fasciata* as figured by Bischoff.

Philorus bionis Aghark.

The type material in spirit was contained in three tubes; one with the male and female types, the second with a female paratype and the third with 5 paratypes.

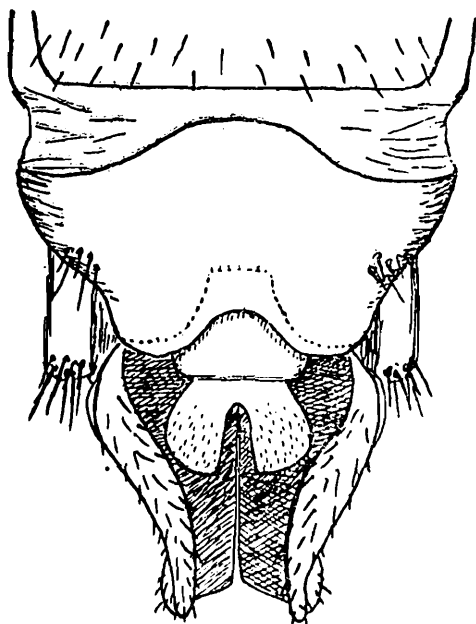


Fig. 4.—Genitalia of *Blepharocera indica* (paratype).

The male holotype is not in very good condition, the wings are much torn and only two legs, the front and hind ones, remain attached to the body; the metanotum is much mangled so that the colour pattern cannot be made out.

The head seen in profile is depicted in Fig. 5; it is as figured by Agharkar as far as the antennae and palpi are concerned, but the lower corner of the eye is not angular but rounded, in fact the whole eye is rounded and there is an indication of a division of each eye, the upper portion being very small and also paler than the lower one. In this holotype the division is hardly perceptible but is more distinct in some

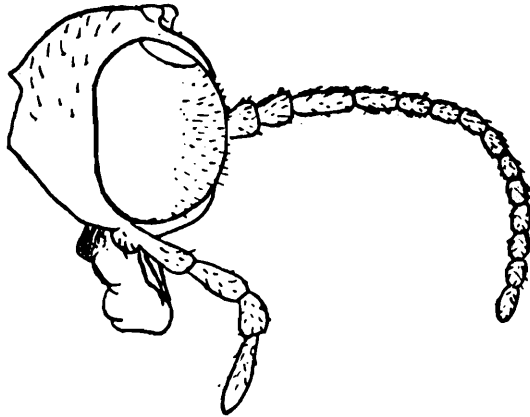


Fig. 5.—Head of male of *Philorus bionis* Aghar.

paratypes. The facets are of equal size in both divisions and the line of demarcation is very fine, it is sometimes merely perceptible only because the arrangement of the facets on one side does not correspond to that of the other side of this line.

The relative measurements of the legs are as follows :—

Leg.	Femora.	Tibiae.	Tarsi.				
			I	II	III	IV	V
I	48	40	24	7	4	5	7
II detached	34	34	15	3.5	3	3	6
III	63	56			missing.		

No epicondyli present; the mid-tibiae have a small apical spur and the hind-tibiae two, a small and a large one (one hind leg present). This last is apparently not a constant character as none of the paratypes show it; they have only one spur larger than the one of the mid-tibiae and in one specimen it is altogether missing in the hind legs. Claws simple, no trace whatever of empodium and pulvilli.

The hypopygium has been redrawn (Fig. 6); it is evidently the hypopygium of this species that Agharkar tried to figure although his drawing appears to represent something quite different. The two median more or less hook-shaped pieces of his drawing are obviously intended to represent the dorsal plate (10th tergite) or tergum of anal valve. When seen in alcohol, this appears to be composed of two separate symmetrical pieces, because the median portion is more transparent and some heavier chitinization shows through the integument. Agharkar has figured the forceps very diagrammatically and has drawn their

basal internal appendages on the outside of the coxites, otherwise the shape of these processes is approximately correct ; they have a ventro-basal lobe as shown in my Fig. 6a.



Fig. 6.—Hypopygium of *Phylorus bionis* Aghar. (type).

The female allotype is in better condition than the male, and with all legs attached. The head and its appendages are very similar to the male only a little wider. The structure of the clypeo-labrum is the same in both sexes and not as depicted by Agharkar ; mandibles absent. The eyes show more clearly the division than in the male. The thorax exhibits a very distinct colour pattern as represented in Fig. 7 ; the anterior

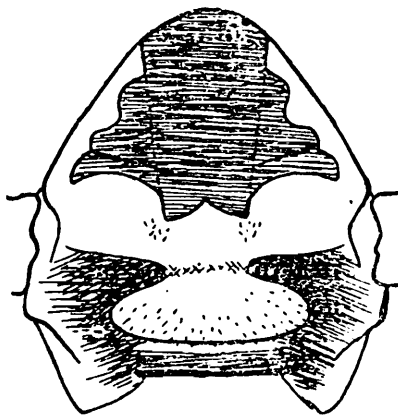


Fig. 7.—Colour pattern of thorax of female allotype of *Phylorus bionis*.

dark marking is somewhat variable in the paratypes ; there is sometimes a thin median pale line as well. The colour pattern is more marked in the female than in the male. The relative measurements of the legs are as follows :—

Leg.	Femora.	Tibiae.	Tarsi.				
			I	II	III	IV	V
I	35	35	16	5	4	3	6.5
II	31	37	16	6	4	3.5	6.5
III	47	47	20	6	4	3.5	6.5

There is a small apical spur on the mid-tibiae and a large one on the hind-tibiae. The genitalia are shown in Fig. 8; they correspond rather

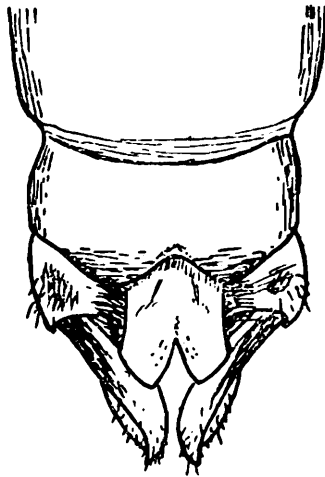


Fig. 8.—Female genitalia of *Philorus bionis* (allotype).

well with Agharkar's figure, except that he represented the subgenital plate as formed of two symmetrical pieces. The female paratype of the second tube has its head detached and flattened in such a way that it is nearly certain that it was the one used by Agharkar to make his drawing. The eye division is almost imperceptible. The head was cleared in KOH and examined under high power. There is no trace of mandibles present, the maxillae are short and barely reach the end of the second palpal segment.

The wings are the best preserved in this paratype and their venation quite agrees with Agharkar's figure.

From this examination the following amendments and additions have to be made to the original description :—

- (1) The eyes are subdivided, although sometimes very indistinctly and the facets of each division are of equal size.
- (2) The hypopygium is of the simple type found in *Apistomyia* or the *Curupira* group; but the shape of the 10th tergite and of the internal process of the forceps may prove to be definite specific characters.
- (3) The presence of two spurs on the hind tibiae is not constant, it is apparently an exception.

There now remains to be considered the generic position of *Philorus bionis*. In my former paper I questioned whether this species was correctly assigned to *Philorus*, but in the light of the new facts obtained through the examination of the types my conclusions must be revised. I stated that *L. bilobata* should be considered as the type of *Philorus* because it came first in Kellogg's mention of his new genus; but I had lost sight of the fact that, owing probably to the removal of this species to *Liponeura*, *Ph. yosemite* O. S. had been designated by Cockerell as the genotype of *Philorus*.

I was fortunate recently to come across a reprint of Osten-Sacken's paper "Bemerkungen über Blepharoceriden" in *Deut. Ent. Zeit.* 1878, in which *Ph. yosemite* is redescribed at full length. From this account I see that Bezzi's contention that in *Philorus* the eyes are touching in

both sexes is not correct. They are widely separated and divided ; Osten-Sacken says that on the dry specimen he can hardly find a difference in the size of the upper and lower facets ; in spite of this Kellogg gives the upper ones as large and the lower ones as small. Osten-Sacken notes that the hind-tibiae have two spurs and that the antennae are 14 segmented in *Ph. yosemite*.

Now that the eyes of *Ph. bionis* have been found to be divided the only difference between that species and the genotype is the length of the radial sector fork.

The eye structure of *Ph. bionis* is evidently intermediate between that of *Ph. yosemite* and that of *Liponeura* and one is tempted to place it in the latter genus where in one species, *L. bilobata*, m-cu is also present ; but very little is known of this later species and furthermore the mouth parts in *Ph. bionis* are very little developed in both sexes, which is not the case in *Liponeura*.

Agharkar's species, therefore, may for the present be retained in *Phylorus* in spite of Bezzi's opinion that this genus should be restricted to Nearctic species. The presence of genera like *Bibiocephala* and even of *Deuterophlebia* in Asia and North America shows that there is a closer affinity between the torrent fauna of both regions than has been suspected up to now ; the presence of the genus *Phylorus* in both regions is, therefore, not surprising, the more so since a species of this genus exists also as a connecting link in Central Asia.

Quite recently K. Brodsky has described a new species, *Ph. tienschanica*, from the Schabir mountains and it appears that this species may be identical with *Ph. bionis*. The head structure is the same, including the little upper division of the eyes ; the antennae are identical and if the palpi are relatively a little longer, their structure is the same. The thorax has a similar colour pattern and the leg measurements are approximately the same ; they have only one apical spur on the mid and hind tibiae, which has been shown to be normally the case in *Ph. bionis*. The venation is identical. From Brodsky's figures of the hypopygium it seems that the structure of this organ in *Ph. tienschanica* and especially his " Basal platte " (10th tergite) is similar to the one of my Fig. 6. If an examination of the internal basal appendages of the forceps were made they would probably be found to correspond with those in my figure 6a. The subgenital plate of the female is also similar. The only difference in the female seems to be the presence of mandibles in *Ph. tienschanica* which I have not been able to detect in *Ph. bionis* ; the labrum, epipharynx and the horny hypopharynx form a sucking tube within which there is no other organ than the weakly developed maxillae.

Summary.

In this paper a revision is made of the type material of *Blepharocera indica* Brunn. and *Phylorus bionis* Aghar.; the generic status of the latter is discussed and attention is called to the possibility of *Ph. tienschanica* Brodsky being identical with it.