

TWO NEW SPECIES OF HEMEROBIIDAE
(ORDER NEUROPTERA) FROM PAKISTAN.

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AMONGST a collection of Neuroptera (mainly Chrysopidae) received, via the Commonwealth Institute of Entomology, from the Commonwealth Institute of Biological Control, Pakistan, are examples of two species of *Hemerobius*, which appear to be undescribed. These specimens are associated with *Adelges* on *Abies*, and in view of their possible importance as predators of *Adelges*, they are described in this short paper. The locality, Murree, is one which has considerable palaeartic affinities as regards its fauna, and it is not surprising therefore that both new species are allied to European forms frequenting conifers.

The type of one species, the allotype of the other and paratypes of both have been presented to the British Museum (Nat. Hist.).

Hemerobius montanus sp. n. (Figs. 1, 3-9.)

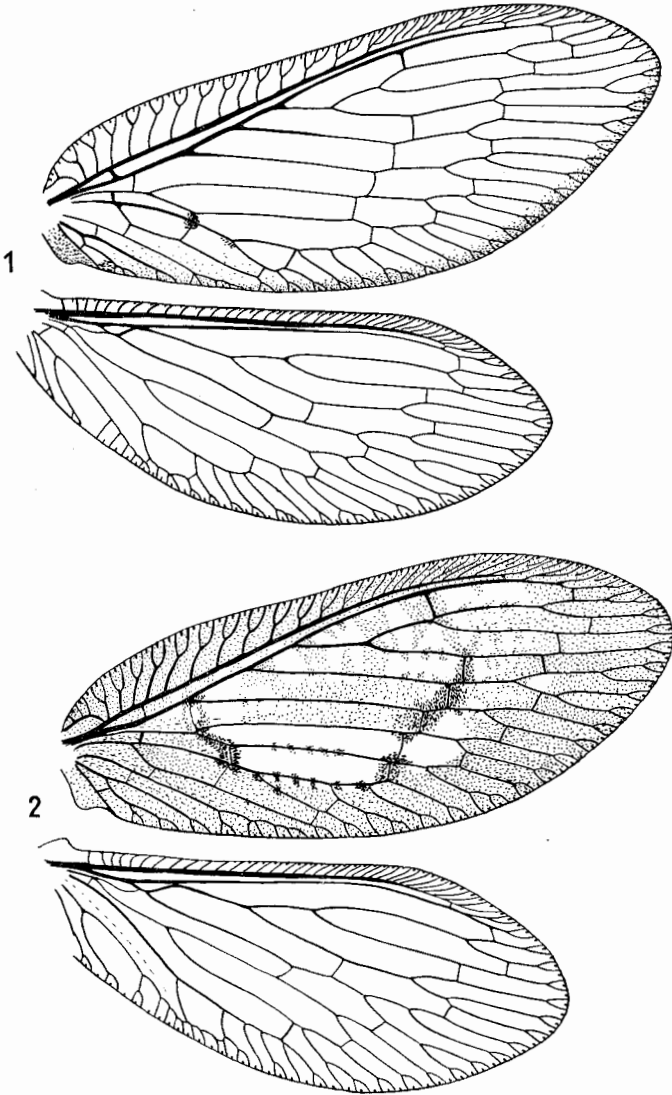
TIBET : Rongshar Valley, 11,000 feet, 28. vi. 1924, Major R. W. G Hingston. Everest Expd., Brit. Mus. 1924-386. *Hemerobius ?japonicus* Nakahara, D. E. Kimmins det. 1 ♂ (*Type*).

PAKISTAN : Murree, 3. vi. 1959. Pupa on *Adelges* on *Abies*. Com. Inst. Biol. Contr., M 34-59. C.I.E. coll. no. 16849, 1 ♂ (paratype); Changlali, 21. vi. 1959. Adult on *A. pindrow*. C.I.E. Coll. no. 16849. 1 ♂ (*Allotype*).

♂ *Type*. Head with vertex and face pale yellowish, becoming slightly fuscous adjoining the eyes on vertex; genæ and sides of clypeus shining fuscous. Antennæ pale tawny (incomplete). Pronotum with a tawny yellow median stripe and lateral angles, remainder fuscous. The median tawny stripe and fuscous lateral bands extend tailwards over meso- and metanota. Sides of thorax and legs tawny yellow. Abdomen tawny yellow.

Both right-hand wings are damaged and, to facilitate comparison, the venation has therefore been drawn from the reversed left-hand wings. Fore wing almost hyaline, with very pale veins, the longitudinal veins marked with fuscous in short streaks, R_1 with more definite fuscous spots at the bases of R_{2+3} , R_4 and R_5 . Arising from the fuscous streaks on the longitudinal veins, the membrane bears faint sagittate fuscous marks and the posterior margin of the wing is faintly clouded with fuscous. The basal subcostal cross-vein and the cross-vein between M_{3+4} and Cu_1 are more heavily marked with fuscous, as is the fork of Cu_1 . Gradate veins pale fuscous. Hind wing hyaline, veins pale, marked with fuscous at the gradate veins and the forks adjacent to them, the fork of R_{2+3} and the branches of 1A.

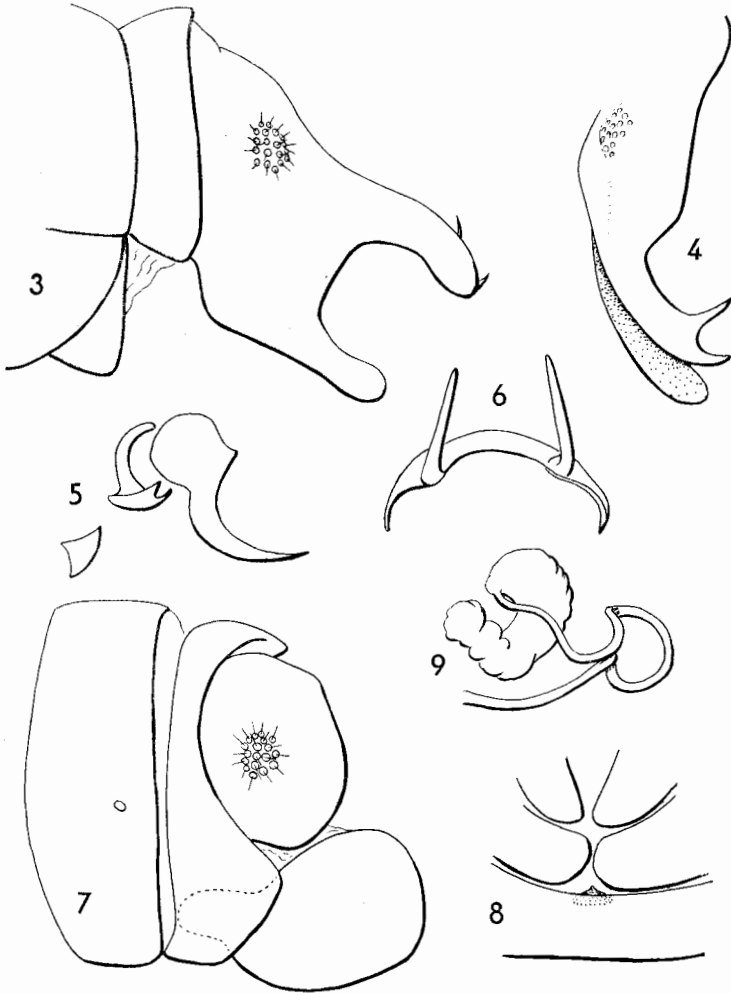
Figs. 1-2.

Wings of *Hemerobius* spp. ♂.1, *H. montanus* sp. n., Type. 2, *H. adelgivorus* sp. n., Type.

♂ Genitalia of the *simulans* pattern. Ninth sternite weak. The ectoproct is deep and terminates in two digitate processes (anoprocessus and catoprocessus), both curving inward, and in side view with their apices approaching each other slightly (not diverging as in *simulans*).

The anoprocessus terminates in two slender, acute projections. Gonarcus slender, terminating laterally in semi-transparent, rounded lobes. In the type, the male genitalia had been mounted in lateral view as a preparation in canada balsam for about twenty years and the gonarcus is consequently slightly compressed and more bowed than in the paratype. The lateral and ventral views of the gonarcus have therefore been corrected from the paratype. Entoprocessi widely separated, claw-like in lateral

Fig. 3-9.



Hemerobius montanus sp. n.

Genitalia. 3, ♂, lateral. 4, ♂ ectoproct from behind. 5, ♂, gonarcus, paramere and hypandrium, lateral. 6, ♂, gonarcus, ventral. 7, ♂, lateral. 8, ♀, eight and ninth segments and gonapophyses laterales, ventral. 9, ♀ spermatheca, more enlarged.

view, curving downward and then caudad as in *simulans*. Parameres weakly developed, apical part slender, parallel and downcurved, bases dilated.

♀ Allotype. Antennæ broken off. Head and thorax as in male. Wings marked as in male, but in the left fore wing R_2 and R_3 arise separately from R_1 , and in the right they arise from a common point but are not stalked.

♀ Genitalia. The eight tergite forms a complete ring, about as wide dorsally as ventrally and not excised ventrally, although the line of fusion of the ends of the tergite ventrally is less sclerotized. Ninth tergite narrowed laterally, the dorsal portion forming a triangular dorsal lobe, and the pleural ends of the tergite dilated. Gonapophyses laterales broad, rather blunt apically in view. Ectoprocts short, ovate, with a group of about seventeen trichobothria. Subgenital plate small, transverse, its anterior margin cuspidate.

LENGTH OF FORE WING, ♂, ♀, 8 mm.

♂ Type, ♀ allotype pinned, abdomens cleared in KOH solution and preserved in glycerine, in British Museum (Nat. Hist.). ♂ paratype in collection of Commonwealth Institute of Biological Control, Murree, Pakistan. The ♂ type was originally identified by myself as *Hemerobius ?japonicus* Nakahara, over which name it has remained in the British Museum for a long time. When working on the specimens from Pakistan I realised that the Tibetan male was conspecific. In neuration they resemble *japonicus* but the ectoprocts of the male differ from Nakahara's figure, the apical processes not being divergent but beginning to converge apically, enclosing a quadrate rather than a parabolic space. Nakahara does not state whether the male entoprocessi in *japonicus* are upcurved. *H. montanus* is closely allied to *H. simulans* Walker, from which it differs in the shape of the male ectoprocts.

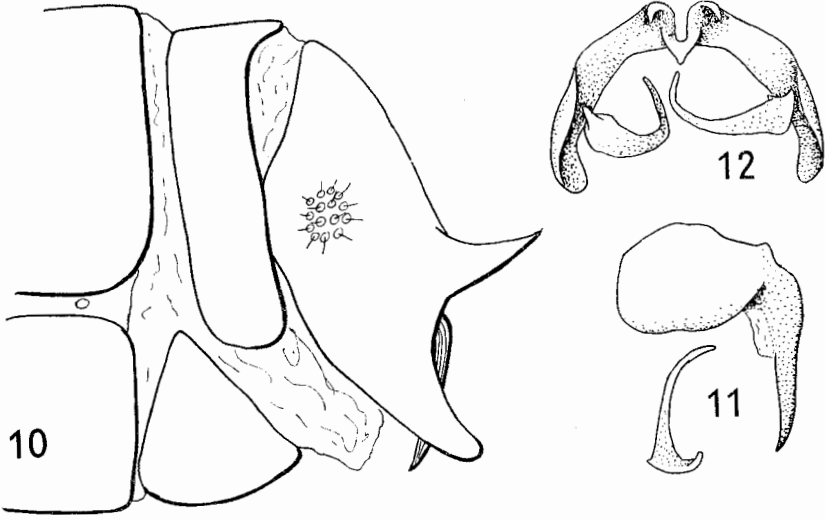
Hemerobius adelgivorus sp. n. (Figs. 2, 10-14).

PAKISTAN : Murree, 28. v. 1959. C.I.B.C., M33-59. Larva on *Adelges* on *Abies* stem. C.I.E. Coll. no. 16849. 1 ♂ (TYPE); Murree, 16. vi. 1959 C.I.B.C., M103-59, Larva on *Adelges* on *A. pindrow*. C.I.E. Coll. no. 16849. 1 ♂ (paratype); Koozagali, 21. vi. 1959. Adult on *A. pindrow*. C.I.E. Coll. no. 16849. 1 ♂ (paratype).

♂ Type. Head yellowish, genae and sides of clypeus shining fuscous. Occiput at sides adjoining eyes fuscous. Antenna tawny yellow. Palpi fuscous. Pronotum fuscous above, with yellow median longitudinal stripe. Meso- and meta-nota pale fuscous, with yellowish mid-line. Legs pale tawny yellow. Abdomen yellowish.

Fore wing pale fuscous, with hyaline markings on the disk and an almost completely hyaline area between the branches of M and in the long cell between M_{3+4} and Cu_1 . The veins are pale, dotted with fuscous, the inner gradates fuscous and bordered with the same colour.

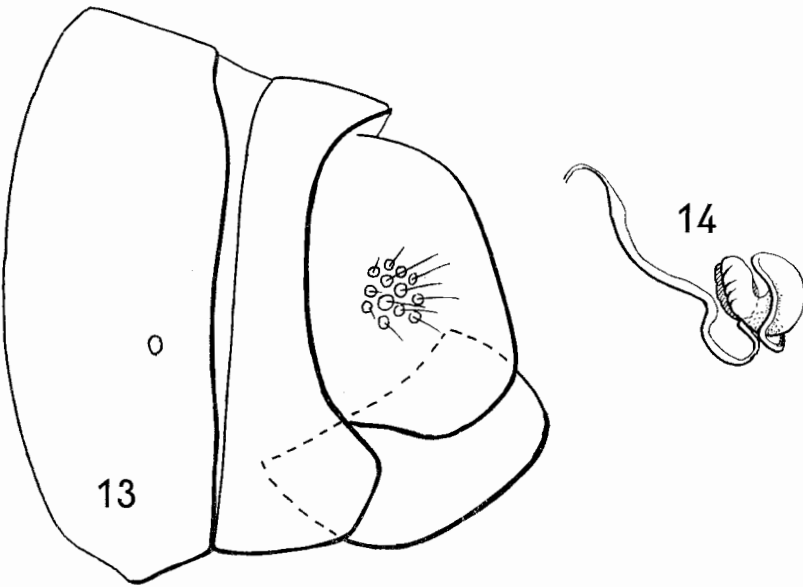
Figs. 10-12.



Hemerobius adelgivorus sp. n.

♂ genitalia. 10, lateral. 11, gonarcus and paramere, lateral. 12, gonarcus and parameres, ventral.

Figs. 13-14.



Hermeobius adelgivorus sp. n.

♀ genitalia. 13, lateral. 14, spermatheca.

There is also a conspicuous fuscous mark covering the basal part of M_{3+4} and the cross vein joining this vein to Cu_1 . The latter vein has five or six strong fuscous spots between the cross-vein and the inner gradate series. The R-M cross-vein runs from the origin of R_5 to the fork of M, as in *H. pini* and *H. contumax*. Hind wing hyaline, veins pale.

♂ Genitalia. Ectoproct of the *pini* pattern, the two apical branches in side view widely and obtusely divergent, of about equal length, the anoproductus acute and incurved, the catoproductus tapering to a rounded apex. Gonarcus with ovate lateral wings, entoproducti situated fairly close together, directed downwards and slightly outwards in tapering spines. From beneath, their bases are separated by a narrow excision. Parameres slender, curved, with dilated bases.

LENGTH OF FORE WING, 6 : 7 mm.

♂ Type, ♂ paratype (Murree) in British Museum (Nat. Hist.), ♂ paratype (Koozagali) in C.I.B.C. Collection, Murree. This species is closely related to *Hemerobius fenestratus* Tjeder, but may be distinguished in the male by the more widely gaping branches of the ectoproct, the angle formed by the anoproductus and catoproductus being obtuse, whereas in *fenestratus* it is a right angle, although the base of the excision is rounded. The gonarcus and entoproducti do not show much difference.

Two females, one from Murree, Sept. 1943, D. Leston and the other from Kashmir, F. J. Mitchell (both in the British Museum (Nat. Hist.)), may belong to this species. ♀ Genitalia. Eight segment forming a complete ring, ventral surface concave. Ninth tergite short and deep, lower lateral angles rounded. Gonapophyses laterales about twice as deep as long, subrectangular, apical angles rounded. Ectoproct from side subrectangular, with rounded angles. Spermatheca forming a thrice-folded sac with a long sinuous duct.

Bibliography of the Neuropterida

Bibliography of the Neuropterida Reference number (r#):

236

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