

The Himalayan Dragonflies of the Genus *Sympetrum* (Odonata, Libellulidae)¹⁾

By

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Abstract

A revision was made of the endemic Himalayan species of the genus *Sympetrum* based mainly on the collection of the National Science Museum, Tokyo. *Sympetrum commixtum* is believed to be the Himalayan form of *S. striolatum* which ranges from North Europe to Japan. The two species, *S. hypomelas* and *S. orientale* are endemic species in this area. *Sympetrum haematoneura* which has been an enigmatic insect from taxonomic viewpoint proved to be the vicariant of Japanese *S. speciosum* known in Japan and high mountains of Taiwan.

The dragonflies of the genus *Sympetrum* are distributed extensively in the Northern Hemisphere, from North Africa to the Far East, from Alaska even to South America. In the Eurasiatic Continent many species appear over a broad area usually in large numbers. In the Himalayan region, however, there seems, besides several broadly ranging arid-zone species, to exist a particular group neither Euro-Siberian nor Sino-Japanese, but endemic to this area. These are: *Sympetrum orientale* (SELYS, 1883), *S. hypomelas* (SELYS, 1884), *S. commixtum* (SELYS, 1884) and *S. haematoneura* FRASER (1924). The first three were named just one hundred years ago, the last one sixty years ago. Hence, little attention has been paid to these forms excepting the works of RIS (1911) and FRASER (1936) which are still insufficient in details.

Recent Himalayan surveys made by the experts of the National Science Museum, Tokyo, brought about a considerable number of material of these dragonflies which made this revision possible. This paper will give a revised description of these species including the allotype description of *S. haematoneura*. All the material including the allotype specimen will be deposited in the collection of the Department of Zoology, National Science Museum, Tokyo.

My sincere thanks are due to the following experts who paid painstaking efforts during the surveys: Dr. Shigeru AE, Mr. Yoshiaki NISHIKAWA, Dr. Mamoru OWADA, Dr. Masataka SATÔ, Dr. Shun-Ichi UÉNO, Mr. Masaaki TOMOKUNI. My thanks are also due to the following colleagues who supplied important additional material

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1. *Sympetrum commixtum* (SELYS)

Diplax commixta SELYS, 1884, p. 38, "Patrie: Inde septentrionale" (a single ♂).

Sympetrum subpruinatum KIRBY, 1886, p. 326, pl. 33, fig. 7 (♀ India).

Sympetrum subpruinatum: KIRBY, 1890, p. 14, "N.W. India".

Sympetrum commixtum: KIRBY, 1890, p. 16, "N. India".

Sympetrum commixtum: MORTON, 1907, p. 304, "N. India, Deesa, July 1 ♀".

Sympetrum commixtum: RIS, 1911, pp. 634–635, fig. 365 (♂ acc. gen., ventral & lateral), "Coll. Selys: 1 ♀, Inde septentrionale (Selys' type) — Brit. Mus.: 4 ♀ N.W. India (Kirby's types); 1 ♂, Tsushima (ob richtig?)".

Sympetrum commixtum: BARTENEF, 1919, pp. 355–357 (ex RIS, 1911, India, Tsushima).

Sympetrum commixtum: FRASER, 1919, p. 498, "Throughout continental India, the Deccan, Deesa, N.W. India".

Sympetrum commixtum: FRASER, 1936, pp. 372–373, fig. 107a (♂ acc. gen.), "A rare or local insect. It has been reported from N. and N.W. India only. Morton has reported it from Deesa (Coll. Nurse's specimen). I have specimens from Abbotabad and from Yusimarg, Kashmir, the latter collected by B. Fletcher during August. —".

Sympetrum commixtum: ASAHINA, 1955, p. 300, "A: 2 ♂ Oct. 4, 1952, Pisang, B: 2 ♂ 1 ♀ Oct. 5, 1952, Mananghbot, B.C. 3500 m, leg. K. Imanishi" (Nepal).

Sympetrum striolatum commixtum: ASAHINA, 1974, p. 284, "1 ♂ Tukche 2650 m (Nepal), 8. VII. 1973".

Sympetrum commixtum: CHAO, 1981, p. 55 (Tibet, Sinkiang).

Specimens examined. Coll. Schmidt—2 ♂ 1 ♀, Moshing 6,800 ft., Kameng Assam, N. O. Grenze, 7. X. 1961, F. SCHMID. Coll. Asahina—2 ♂, Pisang, 3,080 m, 4. X. 1952, NW of Annapurna, Central Nepal; 2 ♂ 1 ♀, Mnangbhot, B. C., 3,500 m, Nepal; 7 ♂ 3 ♀, Godavari, Kathmandu, 30. V. 1981, Leg. S. ASAHINA; 1 ♂, Palgam, Kashmir, 18. IX. 1971, 1 ♀, Gulmarg, Kashmir, 19. IX. 1971, 1 ♂ 3 ♀, Tanmarg, Kashmir, 19. IX. 1971, all leg. I. HATTORI; 1 ♂ 3 ♀, Dalhohe, Surinagar, 7. X. 1952, 1 ♂, Shalamar Gardens, Shalamar, 9. X. 1952, 1 ♂ 2 ♀, Phalgam, 12. X. 1952, 9 ♂ 3 ♀, Dalhohe, 14. X. 1952, 1 ♀, Wular Lake, 15. X. 1952, 3 ♂ 1 ♀, Road to Sonamarg, 18. X. 1952, all in Kashmir, leg. A. SVIHLA. Coll. Kyushu Univ.—1 ♂, Godavari, Nepal, 16. VI. 1972, leg. H. MAKIHARA. Coll. Hokkaido Univ.—1 ♂, Godavari, Nepal, 16. VI. 1968; 2 ♂, Langtang Valley 3,000 m, Ghora Tabela, 23. IX. 1975, leg. S. TAKAGI. Coll. Natn. Sci. Mus., Tokyo—1 ♂, Gonda 2,240 m, 15. X. 1979, leg. S. UÉNO; 1 ♂ 1 ♀, Rara Daha, 26. IX. 1981, leg. S. AE; 1 ♂ 1 ♀, Jumla, 19. IX. 1981, leg. M. TOMOKUNI; 2 ♂, Sharinka, 25. IX. 1981, leg. S. AE; 1 ♀, Jumla, 1. X. 1981, leg. S. AE; 1 ♂, Shivalaya, 15. X. 1981, leg. Y. NISHIKAWA. Coll. Copenhagen Mus.—2 ♂ 2 ♀, Gulmarg, Kashmir, 2,500–3,000m, 17. VIII—5. IX. 1978. Coll. Martens—1 ♂ Tukche-Thakkhola 2,650 m, Nepal, 8. VII. 1973, leg. J. MARTENS.

A plenty of material, teneral and adults, were available. I entirely agree with RIS to believe that this is a local race of *S. striolatum* which shows a broad range and

is apt to establish local races, *imitoides* BARTENEV in the Far East, *nigrifemur* SELYS in North Europe. However, I shall leave this form in species status since its present range seems strictly isolated making no doubtful intermediate forms.

The original description of SELYS (1884) is quite poor based on a single male from "Inde septentrionale". RIS' revision based on SELYS' and KIRBY's material is also brief, though the figures of male accessory genitalia are reliable. For RIS' "Tsushima" record, refer to ASAHINA (1970).

Later description by FRASER (1919, 1936) who might have used sufficient material did not refer to the maturity of his specimens, making the description superficial.

♂: Abd.+app. (20)–26–28 mm, hindwing (24)–28–33 mm.

Labium pale yellow entirely during teneral stage, dark browned in aged insect. There is no dark margin along the inner edge of lateral lobe (Fig. 2). Basifrontal stripe ambiguous, usually only tinted with vestigial shadow on lateral side (Fig. 1).

Pterothorax rather robust, entirely brownish on the front, wholly yellow on the sides (Fig. 3), with narrow black stripes on the humeral and metathoracic interpleural suture, respectively. In aged insects the latter stripe greatly widened to cover whole the space to the level of first lateral stripe (pterothoracic interpleural suture) (Fig. 4), thus giving resemblance to that of *S. hypomelas* and *S. haematoneura*. It should be noted that the ground body colour never changes bright reddish in mature insects. In teneral insects the legs are black excepting coxae, trochanters and external side of tibiae. In extremely young males there are paler nuance on the tibiae, which is an evidence of the nominotypical subspecies of *S. striolatum*. Soon all the legs change into deep black, but in some specimens there are sometimes vestiges of fine yellow streak outside the femora and tibiae.

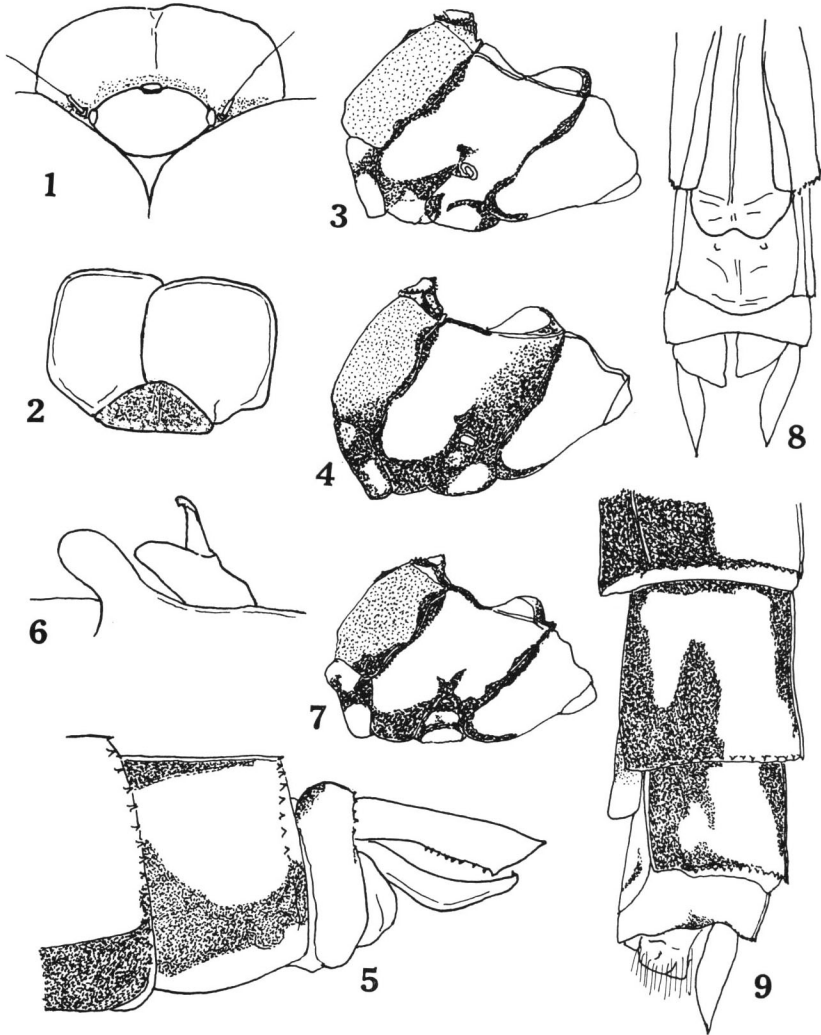
Wings are as shown in Fig. 37, veins are greyish, the antenodals 6.5–7.5/5–6. In the hindwing the base is tinted with golden yellow within the space of *ac*. There is only a slight indication of changing reddish in whole basal veins in very aged males. Membranule whitish or very pale brownish.

Abdomen pale brown on dorsal side, dark greyish on ventral side of 2–9 segments, the latter part which is deflexed portion of abdominal tergites changes into deep black in later stage. However, the dorsal side never changes bright red as usual *Sympetrum* species

Features of abdominal end as Fig. 5, there is a black stripe on the dorsal ridge of segment 9; superior caudal appendages not darkened, rather broad with ventral row of about 9 short spines arranged beyond the middle of entire length. Accessory genitalia with characteristic long and slender inner branch of posterior hamulus which is brownish and is peculiar to *striolatum* sensu lato (Fig. 6).

♀: Abd.+app. (22)–27–29 mm, hindwing (25)–31–33 mm.

Body pattern of head and thorax is quite similar to that of immature males (Fig. 7), but the development of the broad dark band on metepisternum is not strong. The legs are more clearly striped in teneral females. Abdomen coloured generally similar to that of the male. The ventral side turns black and occasionally palely pruinosed.

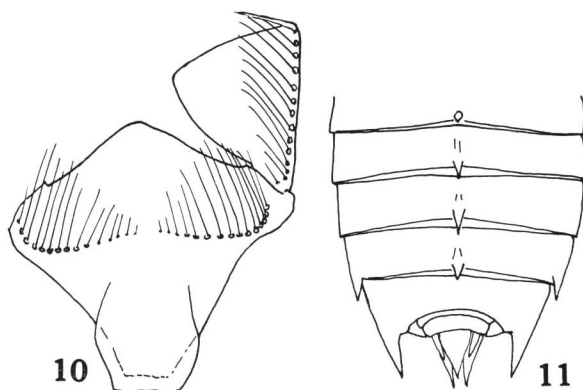


Figs. 1-9. *Sympetrum commixtum* (SELYS). — 1. ♂ Head, dorsal. 2. ♂ Labium, ventral. 3. Petrothorax, teneral ♂. 4. Do., mature ♂. 5. ♂ Abdominal end, lateral. 6. ♂ Accessory genitalia, lateral. 7. Pterothorax, lateral ♀. 8. ♀ Abdominal end. 9. Do., lateral.

The valvula vulvae is characteristically elongated, clearly extending beyond the end of 8th sternum, slightly bilobed but never bending ventrad (Figs. 8, 9).

Distribution. N.W. India (Deesa), Kashmir, Nepal.

Remarks. This species appears to be broadly distributed including the Himalayan region, but its exact range has not been confirmed. Usually the body size is rather large, hindwing length being more than 30 mm, but those taken at high altitude seem



Figs. 10–11. *Sympetrum commixtum* (SELYS), larva. — 10. Labial mask, inner view. 11. Abdominal segments, dorsal.

to become smaller. Both sexes taken at Manangbhot 3,500 m, Nepal, are so small that the wing-length is only 24–25 mm.

I have once collected many transforming adults from a garden-pond at the Godavari Botanic Garden, Nepal (30. V. 1981). It looked like our *Sympetrum frequens* emerging from paddy-field, but we do not know if *commixtum* makes swarm flight and migrates to a remote area, as is observed in the Japanese species.

Description of larval stage. On this occasion I shall give a description of larval stage based on 3 ♂ 1 ♀ larval exuviae, collected from the emerging adults, at the Godavari Garden pond, Nepal, on May 30, 1981.

Body length ca. 18 mm, head width 6 mm, hindfemur 6 mm, posterior wing sheath 6 mm, maximum width of abdomen (6th segment) 6.2 mm.

Labium (Fig. 10) with 12–13 lateral setae on lateral lobe, ca. 15 mental setae, of which the inner 4–5 are short. On the outer side of lateral lobe, there are 22–26 small dark spots.

Abdomen elliptical, flat; dorsal spines on 4–8, sharp and pointed posteriorly, never raised as strong keel (Fig. 11).

Lateral spines present on 8 and 9, the former short, about 1/3 length of the same segment (segment length means the length of the segment excluding the spine). Lateral spine of 9th segment is slightly shorter than the segment length of 9, pointed and slightly directed internally (Fig. 11). Ventral side of abdomen unmarked.

Compared with Japanese *S. striolatum imitoides* larvae (ASAHINA, 1970), the lateral spines of the 9th segment appear slightly shorter, but otherwise no recognizable difference can be found.

2. *Sympetrum hypomelas* (SELYS)

Diplax hypomelas SELYS, 1884, p. 37, “♂♀ Khasia Hills ou le nord du Bengal, Atkinson.”

Diplax hypomelas: SELYS, 1891, p. 448, "Cobapo en juin; Puepoli en octobre (Fea)."

Sympetrum hypomelas: KIRBY, 1890, p. 16, "N. India."

Sympetrum hypomelas: RIS, 1911, pp. 659–660, fig. 378 (♂ acc. gen.), fig. 397 (♀ v.v.), "Coll. Selys: 3 ♂ 1 ♀ (Khasia Hills) (Atkinson): 1 ♀ (Thibet Dup.); 1 ♀ Cobapo (Fea) — Coll. K. J. Morton: 1 ♂ Sikkim (W. H. Bath)."

Sympetrum hypomelas: BARTENEV, 1919, pp. 219–222, fig. 84 (thoracic markings), fig. 85 (♂ acc. gen.), fig. 86 (apex of penis) (ex RIS, 1911).

Sympetrum hypomelas: FRASER, 1919, p. 498, "Bengal, Assam, Khasia Hills, Burma, Thibet, Sikkim."

Sympetrum hypomelas: NEEDHAM, 1930, p. 171, pl. 15, figs. 17 (acc. gen.), fig. 17a (♀ v.v.), "1 ♂ Yao-mah-chen, Lien-yung-hsien, Aug. 28" (Kwangsi, S. W. China).

Sympetrum hypomelas: FRASER, 1936, pp. 373–374, fig. 106c (♂ acc. gen.), "— appears to be restricted to N. Bengal and Assam, but there is a doubtful female from Cobapo, Burma. Mr. Morton has a male from Sikkim, and I have several of both sexes from the same locality. There is a female from Thibet in the British Museum. My own specimens are from Soching, Sikkim, and Kurseong and Gopaldhara, Bengal."

Sympetrum hypomelas: ST. QUENTIN, 1970, p. 405, "Juri 2000 m, 12. VIII. '64, 2 ♂♂ u. 1 ♀: Bandar 200 m, 2–6. VIII. 1969, 2 ♀♀" (Nepal).

Specimens examined. Coll. Schmidt—2 ♂, Dympep, Un. Khasi & Jaintla Hills, Assam, 6,000 ft., 1. X. 1963, F. SCHMID: 1 ♀, Darjeeling, 15. XI., leg. S. ENSLIN. Coll. Asahina—1 ♂ (teneral), Goljagong to Lam Pokhari, 2,850 m, 4. VIII. 1963, leg. T. FUJIOKA; 1 ♀, Do., 4. VIII. 1963, leg. S. AE; 1 ♀, Do., 4. VIII. 1963 (B). Coll. Natn. Sci. Mus. Tokyo—1 ♂, Goljagong, 2,080 m, 28. X. 1979, leg. M. TOMOKUNI; 2 ♂ 1 ♀, Nangarpa 1,750–2,000 m, 11. XI. 1979, leg. S. AE; 2 ♂ 2 ♀, Do., leg. M. TOMOKUNI; 2 ♂ 1 ♀, Drumthali 2,100–2,420 m, 11. XI. 1979, leg. M. SATÔ; 1 ♂ 1 ♀, Do., leg. S. AE; 1 ♂, Pokhare, 14. XI. 1979, leg. M. TOMOKUNI; 1 ♂ 1 ♀, Bagora, 2,140 m, Darjeeling District, 9. X. 1981, leg. M. OWADA; 3 ♂, Jumla, 19. IX. 1981, leg. M. TOMOKUNI.

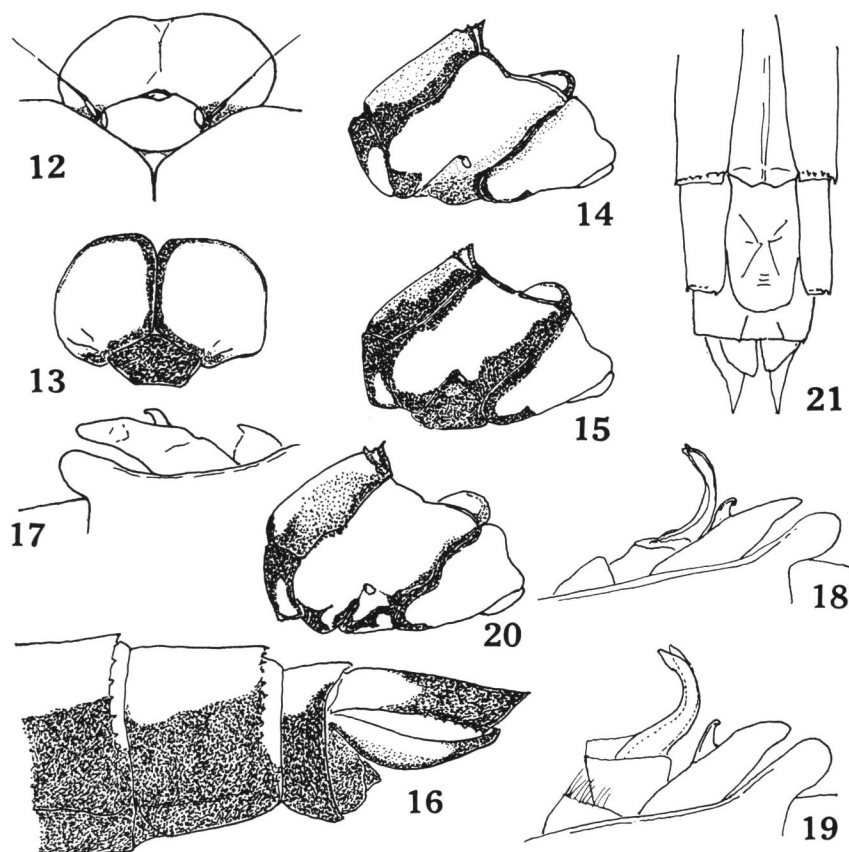
This species looks superficially like the preceding one, if seen from the broadly banded pterothorax, but differs from it in many respects. SELYS' original description is very brief, only compared it with Japanese *S. frequens*! RIS (1911) gave exact figures of the male accessory genitalia and female valvula vulvae based on the type series, and stressed the larger number of antenodal cross-veins and the resemblance with Chinese *S. baccha*, to which I cannot agree.

♂: Abd.+app. 24–26 mm, hindwing 28–32 mm.

Head rather small against the general body-size. In the labium the middle lobe deep black with distinct broad black inner margin in the lateral lobes (Fig. 13). Basifrontal stripe entirely absent, with dark nuance at the base of antenna (Fig. 12).

Pterothorax brownish on the front, the humeral stripe distinct, covering the humeral suture. Sides yellow with a narrow and complete second lateral stripe (Fig. 14). Both lateral stripes change very broad and dark with the age (Fig. 15). Legs entirely black except for basal two segments and the inner side of profemur which are yellowish.

Wings (Fig. 38) narrow, anal angle of hindwing not produced, veins deep black; the extreme base of both wings only faintly suffronated, but individuals from Jumla,



Figs. 12–21. *Sympetrum hypomelas* (SELYS). — 12. ♂ Head, dorsal. 13. ♂ Labium, ventral. 14. Pterothorax, lateral, teneral ♂. 15. Do., mature ♂. 16. ♀ Abdominal end. 17–19. ♂ Accessory genitalia with apical filaments on the last penile segment (19) and the same on more extended penis. 20. ♀ Pterothorax, lateral. 21. ♀ Abdominal end, ventral.

western Nepal, show much extended golden yellow patch reaching the arculus; antenodals of large value 8.5/7. Membranule brownish or, in teneral stage, pale brownish.

Abdomen light brownish or bright reddish (aged insects), ventral side of tergites 3–10 deep black, in terminal four segments the black even extends into the sides of segments (Fig. 16).

Caudal appendages rather broad, superiors deep black at the distal half; with ventral row of about 7 spines on the distal half; inferiors with darkened apex (Fig. 16). Accessory genitalia (Fig. 17) entirely deep black; the outer branch is long and narrowed to the apex, inner branch short and situated proximally. Since Ris' illustration (1911), a strange process attached to penile organ is known. I have checked this structure and

found that it is paired terminal processes of the last penile segment (Figs. 18, 19). FRASER's figure (1936) seems a copy of RIS' (1911), but strange enough the processes are drawn attached to posterior hamulus!

♀: Abd.+app 23–25 mm, hindwing 29–32 mm.

Head and thorax marked as those of the male; the black margin on the lateral lobe of labium is narrower; the thoracic stripes are not broadened as those of mature males but remain less broad, on those of the teneral stage (Fig. 20). Abdomen cylindrical, ventral side entirely black; there is a lateral black stripe from 2 to 6 segments, finally fusing into the black of lateral side of 7th segment. The valvula vulvae is short and black, shallowly divided with low angles (Fig. 21).

Distribution. Assam, N. India, Burma, Sikkim, Tibet, Bengal, Darjeeling, Nepal, Kwangsi (SW. China).

3. *Sympetrum orientale* (SELYS)

Diplax orientalis SELYS, 1883, pp. 140–141, "Patrie: Khasia Hills (Darjeeling) en octobre, par M. Atkinson, Chine sans localité spéciale. Coll. Selys."

Diplax orientalis: SELYS, 1884, p. 37, "Chine (sans localité spéciale). — Khasi Hills, le Darjeeling, par M. Atkinson."

Sympetrum orientale: KIRBY, 1890, p. 16, "Darjeeling, China."

Sympetrum orientale: RIS, 1911, pp. 661–662, fig. 380 (♂ acc. gen.), fig. 381 (♀ v.v.), "Coll. Selys: 2 ♂ 1 ♀ Khasia Hills, (X. 67, 1, Atkinson): 2 ♂ 1 ♀ (Bek) (ohne genauere Bezeichnung, jedenfalls die Exemplare Chine, 1883)."

Sympetrum orientale: BARTENEFF, 1915, pp. 216–218, (Khasia Hills (Darjeeling)); Wiener Hofmuseum 1 ♀ "Caschmir, Hügel."

Sympetrum orientale: FRASER, 1936, p. 375, fig. 106a (♂ acc. gen.), "Known only from the Khasia Hills, Assam. This species varies somewhat in size and markings; it closely resembles *S. hypomelas*, but differs from that species, by the side of thorax dull red instead of bright yellow and the black markings more restricted. The genitalia differs in several important respects and are the best guides for differentiation."

Sympetrum orientale: ASAHINA, 1974, p. 284, "1 ♂ Tal von Kathmandu 1400 m, 27. VIII. 1970."

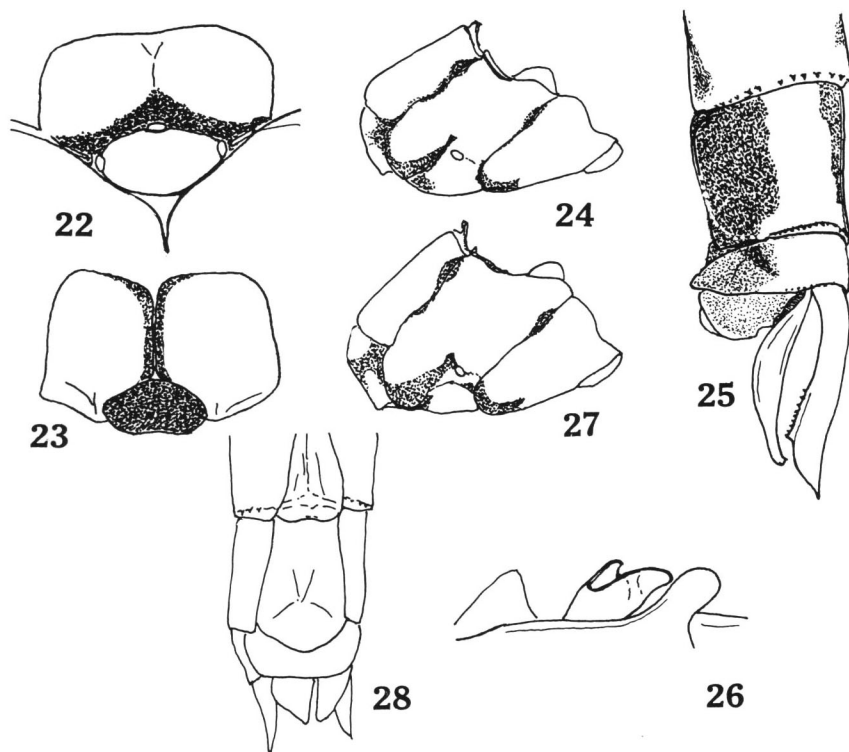
Specimens examined. Coll. Natn. Sci. Mus., Tokyo—1 ♀, Rani Ban, Nepal, 5. X. 1981, leg. S. AE. Coll. Martens—1 ♂, Tal von Kathmandu, 1,400 m, 27. VIII. 1970, leg. J. MARTENS. Coll. Kiauta—1 ♂, Chauni, Kathmandu Valley, 28. IX. 1972, leg. B. KIAUTA.

♂ (ad.): Abd.+app. 26 mm, hindwing 30 mm.

Head, large, labium with black median lobe and black margined lateral lobes (Fig. 23). Basifrontal stripe broad and clearly marked (Fig. 22).

Pterothorax brownish in front, yellow on the sides, with two narrow stripes, one on the humeral suture and the other on metathoracic pleural suture which is probably never broadened even in aged insect (Fig. 24).

Wings (Fig. 39) with pale greyish venation, reddish tinted in basal half, extreme base golden yellow as far as the arculus; pterostigma greyish. Legs black, coxae, trochanters and the inner side of profemur yellowish. Membranule pale brownish.



Figs. 22–28. *Sympetrum orientale* (SELYS). — 22. ♂ Head, dorsal. 23. ♂ Labium, ventral. 24. ♂ Pterothorax, lateral. 25. ♂ Abdominal end, lateral. 26. ♂ Accessory genitalia. 27. ♀ Pterothorax, lateral. 28. ♀ Abdominal end, ventral.

Abdomen rather cylindrical, almost pale brownish on the dorsal side. Underside of abdominal tergites still brownish (or reddish), only inner and segment-end sclerites (“posterior field of sclerite”) are black, thus differing decidedly from *commixtum* and *hypomelas*. There are middorsal black striae on 8 and 9 segments (Fig. 25).

Caudal appendages (Fig. 25) slender and pale coloured, superiors with ventral subapical row of about nine minute spines; inferior appendage not darkened. Accessory genitalia (Fig. 26) low and not prominent, outer branch of the hamulus broad and short, inner branch short and broadly claw-like.

♀: Abd.+app. 24 mm, hindwing 30 mm.

Head large; labium and basifrontal stripe are as in the male. Pterothoracic stripes as Fig. 27. Hindwings with basal suffronated area are as those of the male. Legs entirely black excepting coxae and trochanters. Abdomen broad and cylindrical, dorsal side entirely brownish without any longitudinal side stripe. Ventral side of abdomen entirely black, valvula vulvae short and black, roundly and shallowly bilobed (Fig. 28).

Distribution. Khasi Hills (Assam), "Darjeeling", Nepal.

Remarks. Only two males and one female were available. The original description and later descriptions by RIS and FRASER are rather brief and somewhat problematical in some points as stated below.

Discrepancies from SELYS' (1883) original description:

1. The measurements of body and hindwing length give very small value in SELYS, i.e., "Abd. ♂ 21-23, ♀ 21-23, hw. ♂ 26-28, ♀ 24-26," while ours are: ♂ 26, ♀ 24, hw. ♂ 30, ♀ 30.
2. "Ptérostigma long de 2 mm" is 3 mm in ours.
3. "Le dessous et les côtés (des abdomens) noire" is not so in ours.
4. "La raie basale du front à peine rudimentaire" is not so in our males.

Again, RIS (1911) used the same material which was in SELYS' collection. RIS denied the resemblance to *S. sanguineum* stated by SELYS and mentioned the nearest kin to be *hypomelas*, but the measurements given by him are also very small.

FRASER (1936) stated neither about the lateral lobes of labium nor about the basifrontal stripe. His statement "in some specimens segment 3 to 7 have elongate red spots beneath, thus differing from type" is identical with our males. FRASER said "abdomen with a black interrupted subdorsal stripe on segment 2 to 9 in the females," but it is not so in ours. Such stripe was only recognized in *hypomelas* female. Thus, there seems to exist some confusion of real *orientale* and *hypomelas* in all the three past authors. This should be solved by checking the type series and the Fraser Collection.

4. *Sympetrum haematoneura* FRASER

Sympetrum haematoneura FRASER, 1924, pp. 70-71, "A single male from Nilnag, Kashmir 6900 ft., collected by B. B. Fletcher, 15th August, 1923."

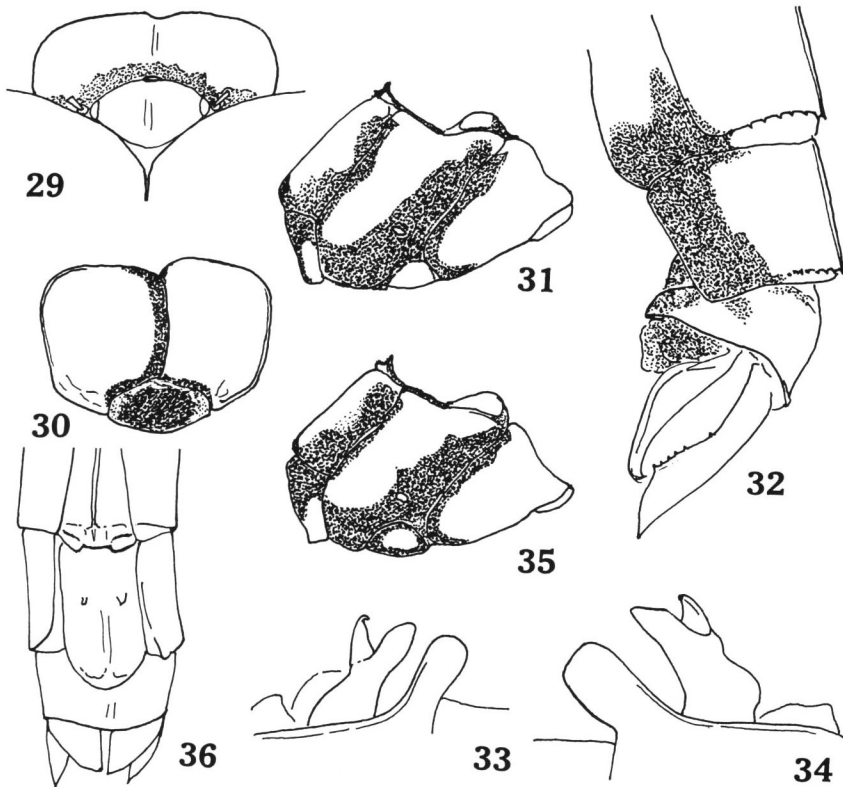
Sympetrum haematoneura: FRASER, 1936, pp. 379-380, "♂ Kashmir"; "The type is from Nilnag 6,900 ft., and was taken in August and is now in the British Museum [However, according to KIMMINS (1966) this does not exist in the Fraser Collection in BMNH. !] It closely resembles *S. hypomelas* and is nearly related to it; it differs by the wing reticulation, by its lower nodal index, and by the presence of red markings beneath the abdomen."

Sympetrum haematoneura: CHAO, 1981, p. 55 (Tibet).

Specimens examined. Coll. Schmidt—1 ♂, Shillong, Assam, Fraser commut. 29-12-1933) (as *Sympetrum* sp.). Coll. Natn. Sci. Mus., Tokyo—1 ♂ 1 ♀ (Allotype), Chordung, Nepal, 24. IX. 1981, 2,450 m, leg. S. AE. Coll. Copenhagen Mus.—1 ♂, India, Utter Pradesh, Mussoorie, ca. 1,500-2,200 m, 3-14. VIII. 1976.

This is a somewhat enigmatic species, named on a single male taken from Kashmir. Fortunately we have here 4 ♂ 1 ♀ from Nepal, Kashmir and Shillong. The female will be described as the allotype specimen in this paper. It is unfortunate that all the material are mature insects, hence we are unable to describe the teneral stage, only supposing the immature coloration to be nearly the same as that of the female insect.

♂ (ad.): Abd.+app. 25-27 mm, hindwing 31-34 mm. The ground colour



Figs. 29–36. *Sympetrum haematoneura* FRASER. — 29. ♂ Head, dorsal. 30. ♂ Labium, ventral. 31. ♂ Pterothorax, lateral. 32. ♂ Abdominal end, lateral. 33–34. Accessory genitalia. 35. ♀ Pterothorax, lateral. 36. ♀ Abdominal end, ventral.

change into dark reddish.

Head with distinct and broad basifrontal black stripe (Fig. 29); the median lobe of labium black with the lateral lobes well margined with black inside (Fig. 30).

Front of pterothorax dark reddish brown; the two broad black stripes covering humeral suture and metathoracic pleural suture are characteristic (Fig. 31). Legs entirely black, perhaps the coxae, trochanters and the inner side of profemur are yellowish tinted.

Wings (Fig. 40) broad, with general reddish tinge in the venation in basal part. In the forewing one cell length of the spaces of *c*, *sc* and *cu* are pale golden yellow; in the hindwing *c*, *sc*, *cu* and below anal area about to the level of *arc* are golden orange. The extent of this area changes slightly with the individuals. Antenodals 8.5/6.0. Membranule pale brownish or brownish.

Abdomen dark reddish on dorsal side (Fig. 32), largely reddish on the ventral side, with distinct black patches on the segment ends. Caudal appendages entirely

reddish with six spines on the ventral subapical ridge. Accessory genitalia show standing posterior hamulus with well divided broad claws (Fig. 34).

♀ (ad.): Abd.+app. 26 mm, hindwing 31 mm. Ground colour brownish, striped with black.

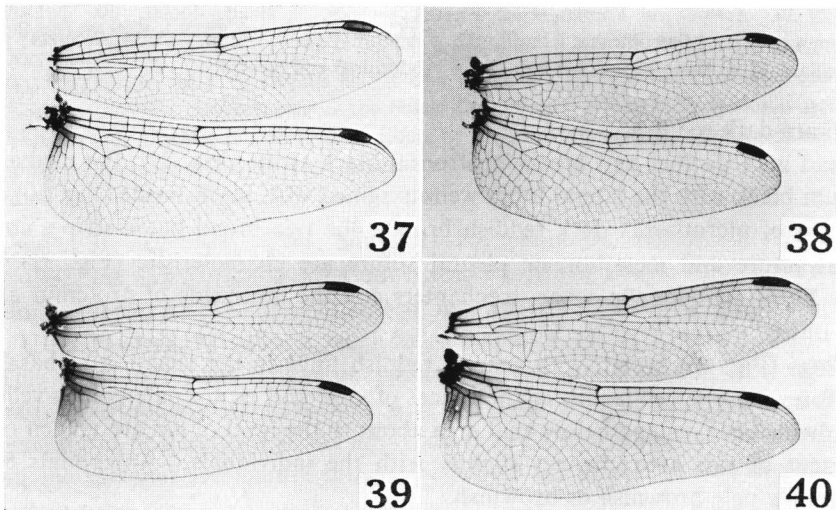
Basifrontal stripe rather reduced, also the dark part of labium. Pterothoracic stripes as those of the male (Fig. 35). Legs entirely black. Wings less reddish tinted than those of the male, retaining the basal golden orange patches as the male insects.

Abdomen brownish on the dorsal side; terminal ridges of each segment well marked with black; ventrally deflected part of tergites is black. Valvula vulvae as Fig. 36, short but with median cut.

Distribution. Assam (Shillong), Nepal, Kashmir, India (Utter Pradesh).

Remarks. I have now found that this species is nothing but the vicariant of Japanese *S. speciosum* OGUMA, or, Japanese *S. speciosum* is the Far Eastern vicariant of Himalayan *haematoneura*! On the highland of Taiwan, there occurs *S. speciosum taiwanum* ASAHINA, (1951) which may be the closest ally of the Himalayan species with less orange stained wings, thus connecting Japan—Highland of Taiwan—Himalayas. It is an interesting fact that *S. haematoneura* has a systematic relationship with Japanese *S. speciosum*, of which we have had no idea of its evolutionary route.

Finally it may be interesting to add an historical event about the male specimen recorded from Shillong, Assam. This specimen was found in the Schmidt Collection. SCHMIDT obtained this specimen by commutation with FRASER, since there is an indication made by FRASER on the envelope, i.e., "*Sympetrum hypomelas* ♂ (!); Shillong, 8. X. 19, F. C. Fraser coll."; "This diagnosis may be doubtful—Would like your opinion?"



Figs. 37–40. Wing venation. — 37. *Sympetrum commixtum* ♂. 38. *S. hypomelas* ♂. 39. *S. orientale* ♂. 40. *S. haematoneura* ♂.

S. commixtum." This is an evidence how FRASER was perplexed, even nine years after naming *S. haematoneura* FRASER!

5. *Sympetrum fonscolombi* SLEYS

Specimens examined. Coll. Natn. Sci. Mus., Tokyo—1 ♂, Jaljale Lekh, 3,640 m, Nepal, 1. X. 1981, leg. S. AE.

This is a well-known migratory species in the genus *Sympetrum*, ranging from North Africa to the Far East. Only a male specimen was taken at rather a high altitude.

References

- ASAHINA, S., 1951. New dragonflies from the northeastern Asia (Odonata). *Kontyû, Tokyo*, **19**: 15–22, 3 pls.
- 1955. Dragonflies. *Fauna and Flora of Nepal Himalaya, Scientific Results of the Japanese Expeditions to Nepal Himalaya 1952–1953*, **1**: 291–300.
- 1970. The Odonata of Tsushima. *Mem. natn. Sci. Mus., Tokyo*, (3): 211–224, 1 pl.
- 1974. Nepalese Odonata taken by Dr. J. MARTENS in 1967/70 and 1973. *Senckenb. biol.*, **55**: 281–291, 1 pl.
- BARTENEF, A. N., 1915. Fauna de la Russie, Pseudonevroptères, **1** (1): 1–352.
- 1919. *Ibidem*, (2): 353–576.
- CHAO, H.-F., 1981. Odonata. *Insects of Xizang (Tibet)*, **1** (1): 53–55. (In Chinese with English summary.)
- FRASER, F. C., 1919. Indian dragonflies, Part IV. *J. Bombay nat. Hist. Soc.*, **26**: 488–517.
- 1924. Notes on Indian Odonata in the Pusa collection. *Mem. Dept. Agr. India*, **8**: 69–87, 2 pls.
- 1936. Fauna of British India, Odonata, III. 461 pp., 2 pls. London, Taylor & Francis.
- KIMMINS, D. E., 1966. A list of Odonata types described by F. C. FRASER now in the British Museum (Nat. Hist). *Bull. Brit. Mus. (Nat. Hist.)*, (Ent.), **18**: 175–227.
- KIRBY, W. F., 1886. On a small collection of dragon flies from Murree and Campbellpore (N. W. India) received from Major J. W. YERBURY, R. A. *Proc. zool. Soc. London*, **1886**: 325–329, 1 pl.
- 1890. A Synonymic Catalogue of Neuroptera Odonata, or Dragonflies with Appendix of Fossil Species. 202 pp. London.
- MORTON, K. J., 1907. Odonata collected by Lt.-Colonel NURSE chiefly in North-western India. *Trans. ent. Soc. London*, **1907**: 303–308, 1 pl.
- NEEDHAM, J. G., 1930. A manual of the dragonflies of China. *Zool. Sinica*, **11**: 1–344+1–11, 20 pls.
- RIS, F., 1911. Coll. Selys Longchamps, Libellulinen, fasc. XIII, pp. 529–700, 1 pl.
- 1916. *Ibidem*, fasc. XVI–2, pp. 1043–1278.
- ST. QUENTIN, D., 1970. Odonata aus Nepal. *Khumbu Himal*, **3** (3): 389–411.
- SELYS LONGCHAMPS, Edm. DE, 1883. Les Odonates du Japon. *Ann. Soc. ent. Belg.*, **27**: 82–143.
- 1884. Révision des *Diplax* paléarctiques. *Ibid.*, **28**: 29–45.
- 1891. Viaggio di Leonardo FEA in Birmania e regione vicine, XXXII. Odonates. *Ann. Mus. civ. Stor. nat. Genova*, (2a), **10**: 433–518.

