

XLIX.—Entomological Expedition to Abyssinia, 1926-27; Trichoptera and Ephemeroptera. By Dr. GEORG ULMER (Hamburg)*.

HITHERTO only two species of Trichoptera and no Ephemeroptera were known to occur in Abyssinia. The material kindly sent me for determination enables us to enumerate 8 species of Trichoptera and 4 of Ephemeroptera—still, surely, a meagre enough list. It was all obtained in the high lands of Central Abyssinia by Dr. Hugh Scott and Mr. J. Omer-Cooper during their expedition, between September 1926 and January 1927, both inclusive. In the present case, almost all the adults of both Orders, and the larvæ of Trichoptera, were collected by Scott, but the numerous nymphs of Ephemeroptera practically all by Omer-Cooper. A first set of specimens, including the types of the new species, is in the British Museum, but I am indebted to the collectors for permission to keep duplicates for my own collection.

I. TRICHOPTERA.

1. *Chimarra abyssinica*, Banks, Trans. Amer. Ent. Soc. xxxix. p. 235 (1913). (Figs. 1-3.)

The type of this species is a ♀. The collection now under review includes a ♂, which can be described as follows:—Head, pronotum, and hind part of the mesonotum golden-yellow, similarly haired; rest of the mesonotum and the whole metanotum, together with the under surface of the thorax, black; a quadrangular black mark on the head between the ocelli, touching the ocelli with three of its corners, while the fourth lies in the middle line directed straight backwards; antennæ blackish brown, about the first five segments yellow, the following segments (about eight) ringed with yellow and brown, the dark part becoming progressively more extensive till the greater part of the antenna appears unicolorous dark; palpi blackish brown, the two first segments and base of the third segment of the maxillary palpi yellow; segment i. very short, ii. long, iii. still longer, iv. shorter than ii., v. about as long as ii. Abdomen dark golden-yellow or ochreous-yellow with a faint reddish tone. Legs yellow, but the coxæ and bases of the femora, also the tarsal segments (excepting the basal part of segment i.), and finally the spurs, are blackish brown; the claws of the front tarsi are fairly large; spur-formula 1, 4, 4.

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according to reference in Scott and Omer-Cooper - Entomological Expedition to Abyssinia 1926-1927.

II. EPHEMEROPTERA.

1. *Polymitarcys savignyi*, Pictet.

The examples of this species are preserved in formol and have darkened.

Loc. Lagalafto Ravine*, between Hawash River and Lake Zwai, ca. 6000 feet, 31. x. 1926, 2 ♀ (*Scott*).

2. *Tricorythus abyssinicus*, sp. n. (Figs. 23 & 24.)

♂ (dried example). Head black, with a little greyish-yellow translucence; eyes coal-black, small, the intervening space twice as wide as the breadth of an eye; antennæ greyish black, the funicle lighter. Pronotum with greyish ground-colour, but all the margins, the middle line, and an oblique stripe on either side from the shoulder to the middle of the hind margin, are broadly black, so that the light ground-colour is much covered over. Mesonotum and metanotum shining chestnut-brown, but the front part of the mesonotum and its sharply prolonged apex are blackish grey. Abdomen dirty grey-black above, its margins black; its ventral surface similar but rather lighter, with a translucent lighter figure on each of the sternites (at least the middle ones); this figure lies nearer the front margin and consists of a pair of lines diverging towards the anus and a pair of spots lying behind them. Caudal setæ smooth, greyish white, the joints and margins narrowly black. Legs with coxæ, femoral rings, and tarsi yellowish, the former with a large black mark on the outer surface, the latter ringed with black at the joints; femora black, but their bases yellowish, tibiæ black with yellowish translucence. Wings evidently with a blackish-grey tone, almost transparent, veins black, cross-veins very fine; in the costal space apparently no cross-veins; in the anal space intercalary vein 1 forms with anal vein 2 a broad fork, which includes intercalary vein 2; this latter is at its base faintly continued to intercalary vein 1, with which it unites archwise; the membrane of the wing-roots which runs round the mesonotum does not extend at all beyond the apex of the latter. Genital appendages (figs. 23, 24) whitish grey; "genital feet" 2-segmented, shaped like little narrow rods, second segment

* [This name is not on any map I have seen, but was taken from our interpreter as nearly as I could get it. The place is a deep gorge with precipitous sides, perhaps 200 feet high, which we came on very abruptly in dense dry bush. Its direction is from a little W. of N. to a little E. of S., through gently undulating country. There was only a trickle of water in the gorge.—HUGH SCOTT.]

rather longer than first and bent inwards, gradually narrowed towards, but not sharp at, the apex ; penis forming a straight rod, consisting of two closely adpressed halves, which almost

Fig. 23.

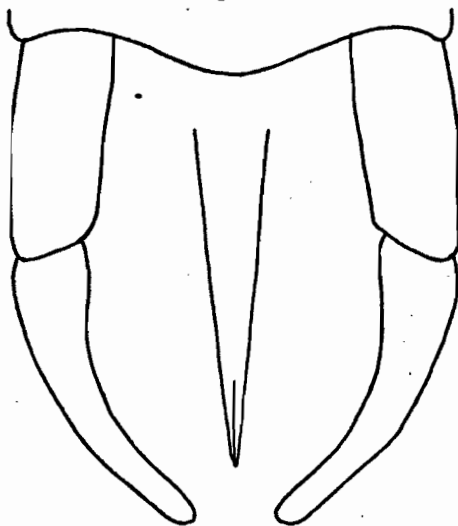
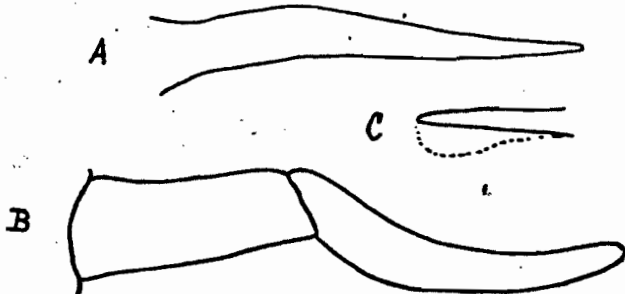


Fig. 24.



Tricorythus abyssinicus ♂.

Fig. 23.—Genital appendages, ventral view.

Fig. 24.—Genital appendages, lateral view. A, penis ; B, genital foot ; C, apex of penis and drop of dried seminal fluid.

unite towards the apex into a long point* ; tenth sternite convex at the hind margin.

* As fig. 24 C shows, the penis bears beneath the apex a little drop of dried seminal fluid.

♀ (dried example). Coloration very like that of ♂, wings much darker, blackish, dull; legs also darker on the whole; intercalary vein 2 runs clearly into intercalary vein 1; here also there is no membrane extending beyond the apex of the mesonotum; caudal setæ hairy.

Length of body 4 mm. (♂), 5 mm. (♀); of wing 6 mm. (♂), 7 mm. (♀); cerci of ♂ three times as long as body (those of ♀ broken off).

Loc. Ravine of the Akaki River, S.E. of Addis Ababa, 6500-7000 feet, at candle-light in tent, 17. x. 1926, 1 ♂, 1 ♀ (Scott).

NOTE.—I place here a second ♂, taken at the same time and place, and now in my collection. It is somewhat smaller than the type, its coloration is rather lighter, and, in particular, the wings have only a very little, scarcely noticeable, blackish-grey tone. It presents no difference in the form of its genital appendages.

The new species, indeed, stands very close to *T. varicauda*, Pict. (Egypt), but is distinguished by its darker colouring and the different form of the penis. *T. poincisi*, Nav. ('Brotéria,' 1926, p. 100, fig. 13), from Nairobi, Kenya, seems to be similar, but nothing is said in the description about its genital appendages.

The African species of *Tricorythus* can, perhaps, be distinguished in the ♂ sex as follows—setting aside *T. sjöstedti*, Ulm., and *T. poincisi*, Nav.:—

- | | |
|---|----------------------------|
| 1 a. "Genital feet" 3-segmented; penis broad and leaf-shaped in ventral and lateral view | <i>T. latus</i> , Ulm. |
| 1 b. "Genital feet" 2-segmented | 2. |
| 2 a. Second segment of "genital feet" about three times as long as first, bluntly rounded off at the end; penis not cleft, not quite continuously tapering from base to apex, but showing a swelling in the middle (in ventral view), blunt-pointed at apex | <i>T. discolor</i> , Burm. |
| 2 b. Second segment of "genital feet" at most one-and-a-half times as long as first, narrowed towards the apex, which is sharper | 3. |
| 3 a. Tenth sternite very strongly triangularly produced in the middle of its hind margin; penis very long, with the form of a slender little rod, somewhat swollen out and shortly cleft at the apex | <i>T. longus</i> , Ulm. |
| 3 b. Tenth sternite with only a feeble rounded prolongation in the middle of the hind margin; penis not so long | 4. |

- 4 a. Penis evenly narrowed almost to a point,
the cleft not distinct *T. abyssinicus*, sp. n.
- 4 b. Penis less narrowed towards the apex,
rather thickened in the middle, the cleft
distinct and deep, the lobes not sharp at
the apex but rounded off *T. varicauda*, Pict.

3. *Cænis scotti*, sp. n. (Fig. 25.)

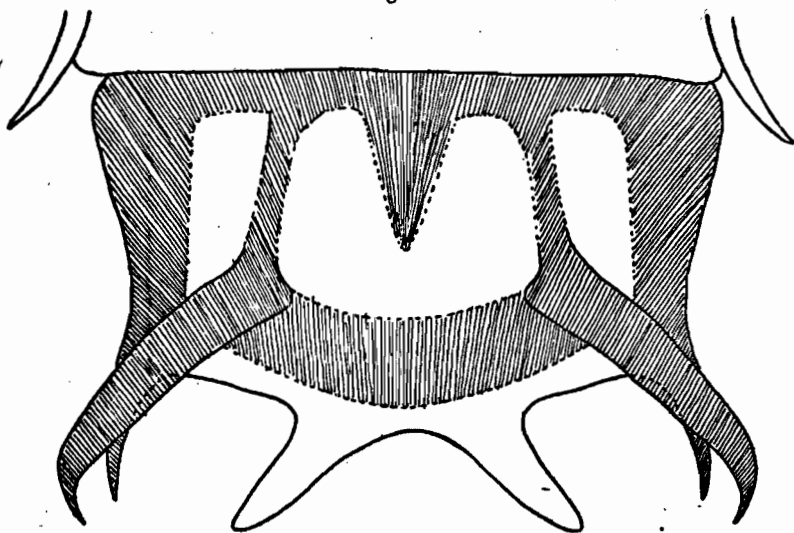
♂ (dried example). Head and eyes black, antennæ blackish grey, pronotum blackish grey with narrow black margins; meso- and metanotum pitch-brown, the former darker at the apex and with sutures narrowly black. Abdomen blackish grey, or olive-grey in transmitted light, the joints darker, the middle line along the back dark; rather lighter beneath than above; the long processes of the hind angles of the last segments (v. to ix.) are light-coloured. Legs blackish grey, front legs as a whole rather lighter than the hinder pairs; femora narrowly black along the upper, light blackish grey along the lower, edge, with dark olive-grey translucence; front tibiæ and all the tarsi lighter grey, base and apex of tibiæ black. Caudal setæ light blackish grey; the first seven or eight segments always lighter at the base than at the apex, narrowly black at the joints; last segments evenly light blackish grey. Wings very translucent, colourless, but the costal and subcostal spaces have a blackish-grey tone; the first three, and in less degree also the remaining, longitudinal veins are grey-black in reflected light; in transmitted light all the veins, excepting the thicker parts of the first three, are translucent whitish. On the last sternite (fig. 25) the lateral parts, a median elongated-triangular or tongue-shaped mark arising from the base, and the hind margin are broadly black, while the rest of the sternite is lighter; the "genital feet," also are black, the penis light; the former are long and narrow, ending in a slender curved point; penis deeply concave at its hind margin, with an almost semicircular emargination, so that the finger-shaped lobes diverge. Last five abdominal segments drawn out at the hind angles into long thorn-like processes.

♀ (preserved in alcohol). Eyes much smaller than in ♂, black. Head and pronotum black-brown, mesonotum black, metanotum black-brown; abdomen dark brown with light yellowish margins. Caudal setæ dark grey, about the first eight segments blackish, hairs short, erect. Lower surface of body lighter, dirty yellowish, margins of thoracic segments black, abdomen brownish grey with light margins;

hind angles of abdominal segments v.-viii. drawn out into short pointed processes. Wings transparent, colourless, the costal and subcostal spaces with a rather brownish-grey tone; veins very clear against a whitish background, dark brown to almost black-brown; in oblique light they look whitish, only the subcosta, radius, and large cross-vein remain dark.

Subimago (examples preserved dry and in alcohol). Entirely dark, wings blackish-grey, caudal setæ dark grey.

Fig. 25.



Cenis scotti ♂; genital appendages, ventral view.

Length of body 4 mm. (♂), 5 mm. (♀); of fore wing 4 mm. (♂), 5 mm. (♀); expanse of wings about 9–11 mm.

Loc. Near Addis Alam, ca. 8000 feet, 19. ix. 1926, 1 ♂, dried ex. (Scott); ravine of Akaki River, S.E. of Addis Ababa, 6500–7000 feet, at candle-light in tent, 17. x. 1926, 1 subimago, dried ex. (Scott); Debra Libanos, ca. 8000 feet, 2. i. 1927, 7 ex., ♀ and subimago, in alcohol (Scott).

A second ♂, taken at the same time and place as the ♀ listed above, is lighter coloured. I prefer not to describe it, as the genital appendages are not quite intact.

NOTE.—This species, which resembles our *Cenis macrura*, Steph. (*halterata*, Fabr., Eaton), even down to the colouring

of the last sternite, is a true *Cænis* (not *Cænodes*), since the front legs of the ♂ are of a length quite typical of the genus. *Cænis haywardi*, Navás (Bull. Soc. Roy. Ent. d'Égypte 1926, p. 211 (1927)), from Assouan and *C. fasciata*, Navás (Mem. Soc. Ent. Ital. vi. p. 89, fig. 3 (1927)), from Somaliland, are unknown to me; nothing is said in the descriptions about their front legs or genital appendages, but it is to be hoped that they are really species of *Cænis*.

4. *Centroptilum* sp.

It is useless to describe the material, since this consists only of subimagines.

Loc. Ravine at Wachacha, S.W. of Addis Ababa, ca. 8000 feet, 9. ix. 1926, 2 subimagines, in alcohol (*Scott*).

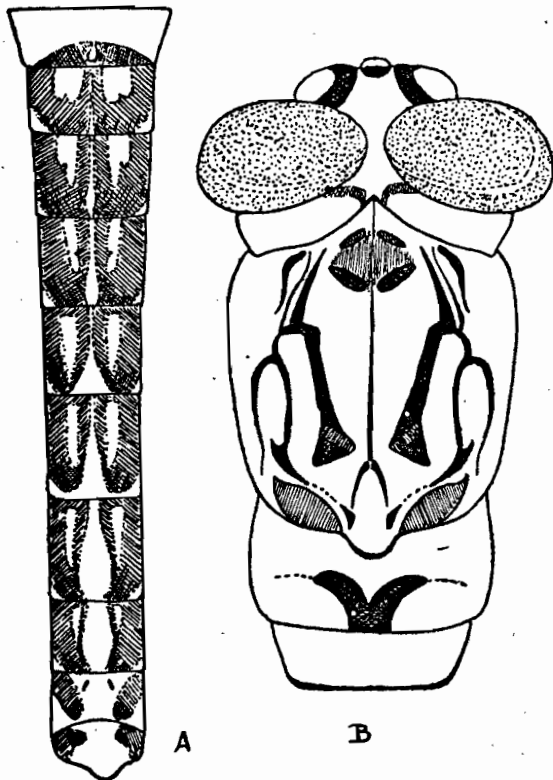
5. *Afronurus pulcher*, sp. n. (Figs. 26-28.)

In this case again there are only subimagines in the collection; but the characteristic pattern on thorax and abdomen justifies naming and description of the species.

Subimago ♂ (in alcohol). Eyes leaden-blackish, often with a narrow, dark purple-brown band round the margin; head (almost entirely occupied by the large eyes) yellow above, ocelli hemmed round with black. Thorax yellow or light yellow above, with clear dark markings (fig. 26). Front part of pronotum (much hidden by the eyes) margined with dark brown. Mesonotum with a median grey-brown patch in front, which is bordered anteriorly by two elongate-oval dark brown marks, posteriorly by two similarly shaped but larger black marks; on either half of the mesonotum a kneed black figure lies longitudinally but rather obliquely (approaching the middle line behind); this figure ends in the form of a sharp-pointed bayonet in front and of a broadened butt behind; from the knee-bend a fine dark brown line runs forwards (parallel to the "bayonet"), and a dark brown or brown-black serpentine line runs backwards, which latter extends to the margin of the mesonotal prominence and also sends off, from a little behind its point of origin (*i. e.*, near the knee-bend), yet another longitudinal branch, lying further outwards; this external branch and the above-described serpentine line together enclose a long-oval space; on either side of the mesonotal prominence lies an oblique dark brown mark, sharp at both ends (having about the form of a statoblast of the Bryozoan *Lophopus*); middle line of mesonotum sometimes brown, and in front of

the prominence lies on either side a little black narrowly triangular spot, from which a curved brown line runs forward to the middle line; lastly, the mesonotum presents in front on either side, externally to the two longitudinal dark markings described above, an S-shaped, serpentine,

Fig. 26.



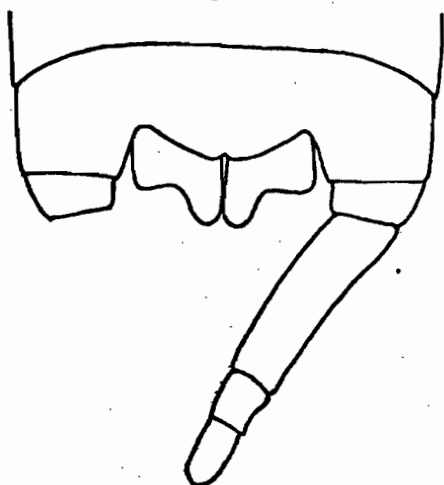
Afronurus pulcher ♂ (subimago).

A, dorsal view of abdomen; B, dorsal view of head and thorax.

longitudinal, black figure. Metanotum with a pair of black stripes curved outwards in front, touching one another in the middle line behind, and reaching the hind margin; they are together shaped rather like the front half of an X.

Abdomen yellowish, often with a weak reddish tone, ornamented with purple-brown marks; tergite i. with a dark area behind, with bow-shaped outline, the hind margin forming the string; the dorsum of the other tergites is crossed throughout by a broad dark stripe, in which the middle line and, in each of tergites ii. to viii., an elongated mark on either side of the middle, remain light; the light median part, very narrow on the front tergites, gets progressively broader on the posterior tergites, the dark lateral areas becoming narrower and further apart; the light lateral

Fig. 27.



Afronurus pulcher ♂ (subimago); genital appendages, ventral view.

marks become gradually narrower from tergite ii. to viii.; the dark areas between the light middle line and the light lateral marks assume somewhat the shape of wedges from about tergite v. onwards; on tergites ix. and x. the light marks coalesce and the dark lateral areas become very small. Ventral surface of abdomen unmarked and having the yellow or yellowish tint which is the ground-colour of the whole body. Caudal setæ yellowish grey, with about the basal twelve segments clearly red or purple-red, with narrow darker rings at the joints. Legs yellow; outer surfaces of all the coxæ and apices of all the femora externally with a

very clear black mark; in transmitted light the front legs, especially the tibiae, are translucent reddish; front tarsi with segment i. almost as long as ii., and the segments diminishing in length in the following order: ii. and i. (about equal), iii. and v. (about equal), iv.; hind tarsi with segment i. $1\frac{1}{2}$ times as long as ii., segments decreasing in length in the following order: v., i., ii., iii., iv. Front tarsus about two-thirds as long as the tibia, hind tarsus scarcely one-third as long as the hind tibia. Wings translucent yellowish grey, longitudinal veins yellowish, cross-veins (less clearly in the hind wings) black and narrowly bordered with grey-black, so that the wings look latticed; fore wings proportionately narrow. Genital appendages (fig. 27) with their contours already recognizable; last tergite prolonged on either side at the hind margin into a truncated process

Fig. 28.

*Afronurus pulcher* ♀; end of abdomen, ventral view.

(which bears the "genital foot"), so that the hind margin is divided into three parts—a wider median, not extending so far back, and two narrower lateral; hind margin of the median part convex, rather bent in at the middle; lobes of the penis lying close together, shorter than broad, emarginate at the hind margin; their hind corners rounded off, broad, and the inner corners extending further back than the outer. "Genital feet" 4-segmented, segment i. short and broad, ii. the longest, iii. rather longer than i., iv. a little longer; iii. and iv. together about half as long as ii.

Subimago ♀ (in alcohol). Eyes much smaller, therefore concealing less of the surface of head and pronotum; head more or less washed over with grey-brown between the eyes and the pronotum, in front of the "marginal seam." Thorax and abdomen marked as in ♂, yet the patterns on the abdomen are often less clear or partly vanished; in particular the wedge-shaped stripes, and these again first on the

posterior segments, can quite disappear, so that the light marks of each segment are very much expanded and only the elongated-quadrangular lateral marks remain of the dark parts; and even these may be faint, especially on the middle segments. Caudal setæ, wings, and legs coloured as in ♂, except that the front legs are often entirely yellow. Front tarsi with segment i. rather shorter than ii.; segments decreasing in length in the order v., ii., i., iii., iv.; front tarsus nearly half as long as front tibia. Hind legs as in ♂. Last sternite prolonged into a plate with converging lateral margins, and hind margin semicircularly emarginate, so that the hind angles are sharp (fig. 28).

Length of body 8-9 mm.; of fore wing 10-11 mm.; expanse of wings about 21-23 mm.

Loc. Muger River Valley, ca. 5500 feet, at light, 27. xii. 1926, 4 ♂, 3 ♀, all subimagines; same place, 29. xii. 1926, 1 ♂, 2 ♀, all subimagines (*all Scott*).

Nymphs.

The numerous nymphs in the collection belong with one exception to the genera *Cænis* and *Cloëon*. The species cannot be determined. The material is as follows:—

1. *Indeterminable, perhaps Ecdyonurid* sp. Mulu, N. of Muger Valley, ca. 8000 feet, from rock-face of small waterfall, 20. xii. 1926 (*Scott*).

2. *Cænis* sp. Serpent Lake, Wouramboulchi*, ca. 9000 feet, 2, 4, & 5. x. 1926; stream below the same lake, 6. x. 1926; Wouramboulchi, 7. x. 1926; small stream S.W. of Mt. Zukwala [Zaquala], ca. 6000 feet, 30. x. 1926; Hora Horeso, Lakes of Addas, ca. 7000 feet, 1. xii. 1926 (*all Omer-Cooper*).

3. *Cloëon* sp. Addis Ababa, British Legation, Ponds nos. 1 & 2, ca. 8000 feet, 8. ix. 1926; Serpent Lake, Wouramboulchi, ca. 9000 feet, 4 & 5. x. 1926; stream below the same lake, 6. x. 1926; Jam-Jam [Djem-Djem] Forest, about 45 miles W. of Addis Ababa, Pond no. 2, ca. 8000 feet, 26. ix. 1926; Mt. Zukwala, in the crater-lake, ca. 9000 feet, 21 & 22. x. 1926; mouth of Sucsuci River, Lake Zwai, ca. 5500 feet, 13. xi. 1926; Lakes of Addas, Hora Horeso, 1. xii. 1926, and Hora Bishuoftu, 2 & 3. xii. 1926, both ca. 7000 feet (*all Omer-Cooper*).

* W. or N.W. of Jam-Jam Forest, that is, roughly W. of Addis Ababa, 50 miles or more; streams running eventually into Blue Nile System.