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Ephemerida.

By Esben-Petersen, Silkeborg.

The collection of Ephemerida, which I received through Dr. Philipp Zaitzev, to whom I am very much indebted and thankful for forwarding it to me, is very interesting. It showed that the Ephemerid Fauna of the investigated localities is very much like that of Arctic Scandinavia. We find again 3 genera: *Chitonophora*, *Sparrea* and *Metretopus* which have hitherto only been found in Norway and Sweden. Besides that we see that the Arctic Ephemerid Fauna is far from being sufficiently explored, and that we may expect to find many new forms, as soon as the researches are proceeded with.

The species found in the collection were the following:

1. *Chitonophora Aroni* Eat.
2. *Baëtis vernus* Curt.
3. *Sparrea norvegica* E.-Peters.
4. *Siphilurus Linnacanus* Etn.
5. *Siphilurus aestivalis* Eat.
6. *Siphilurus* sp.
7. *Ametropus fragilis* Alb.
8. *Metretopus norvegicus* Etn.
9. *Ecdyurus hyalinus* sp. nov.
10. *Heptagenia bipunctata* sp. nov.

Ametropus fragilis Alb. did not occur in the collection, but I have seen a single specimen from the Ural Government at the river Ular, collected by Mr. Basile Bostanjoglo, Moscow.

The collection contained many specimens, both dried and in alcohol, and we see, that *Baëtis vernus* occurred frequently. It was interesting to find, in the rich material of larvae,

the nymphs of *Sparrea norvegica* and *Metretopus norvegicus*. They were previously described by Dr. S. Bengtsson, to whom I am also very thankful for his generosity in presenting to me materials of several imagines and larvæ described in his «Beiträge zur Kenntniss der paläarktischen Ephemeriden».

A. Imagines.

Fam. Ephemerellidae.

This family, Section 6 of the Genera in A Rev. Mon. of rec. Ephem. or Mayflies by A. E. Eaton, contains 3 genera: 2 European-American (*Ephemerella* Walsh and *Chitonophora* Bengtss.) and 1 Asiatic (*Tetlogonodes* Etn.). The two first named genera are separated from each other in the following way:

- a. Hind femur and tibia about of equal length; hind tibia a little longer than hind tarsus.....*Ephemerella*.
- b. Hind tibia much longer than hind femur and about twice the length of hind tarsus.....*Chitonophora*.

Genus *Chitonophora*.

S. Bengtsson: Beiträge zur Kenntniss der paläarktischen Ephemeriden, Lund 1909.

Apart from the differences already pointed out, it may still be noticed that the anterior tibia of the male of the *Chitonophora* is a little longer than femur and that the tarsus is about twice as long as the tibia. Anterior tarsus, tibia and femur of the female almost of equal length. 2. joint of the forceps of the male terminates in a sharply marked quadrangular dilatation.

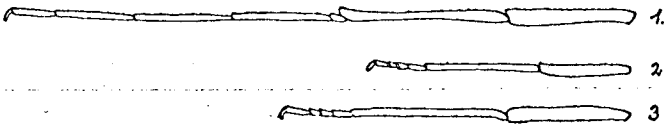


Fig. 1. *Chitonophora Aroni* Eat. Legs of the male.

The type for the genus is *Chitonophora Aurivillii* Bengtss. from Northern Sweden, and to this genus also belong *Chitonophora mucronata* Bengtss., from the same localities, and *Ephemerella Aroni* Eat. from Norwegian Finmarken and Finland.

Chilonophora Aroni Eat.

In Esben-Petersen. Bidrag til en Fortegnelse over arktisk Norges Neuropterfauna. Tromsø Museums Aarshefter 25. 1907—08.

The species was described by Eaton in the above named paper, where he also gave a figure of genitalia of ♂. As I have at hand richer material of the species than Eaton, I will supplement his description and give a better drawing of the genitalia of the male. I have compared the Russian specimens with the type-specimen, which is placed in my collection, and they agree very well.

♂. Imago (in alcohol). Head pitchy brown. The upper part of the eyes yellowish red, the lower part bluish black. Abdomen ventrally light with a faint brownish tinge; 8th segment, laterally, with a brown black streak. Length 10 mm.; anterior wing 10,5 mm.; setae 13 mm.

♀. Subimago (dried). Thorax shining, reddish brown. Abdomen greyish black above, paler towards apex. Hind borders of segments pale. Venter light brown, greyish black towards side margins; the two hindmost segments, light brown without dark margins. Setae greyish black, basally reddish white, without distinct annulations.

Legs, yellowish brown; tarsi greyish black. Fore wings, faintly fumigated; hind wings with a pale yellow tinge. Subcosta and radius in the fore wings, greyish yellow; the other longitudinal main veins, pale greenish grey; cross veins indistinct.

5 specimens, dried, collected 16.—17. VII 1909 at the Kara river, tundra of Kara, Gov. of Tobolsk.

2 specimens in alcohol, collected 17. VII 1909 at the Kara river, tundra of Kara, Gov. of Tobolsk.

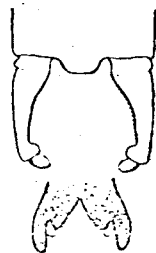


Fig. 2 *Chilonophora Aroni* Eat. Forceps and penis.

Fam. Baëtidae.

Genus Baëtis.

Baëtis vernus.

Curtis: Edinb. Phil. Mag. 1834.

Eaton: A. Rev. Mon. of recent Ephem. or Mayfl. 1883—8.

Many specimens present, some pinned, others in alcohol. 25. VII—23. VIII 1909 at tundra of Kara, Pe-mal and Pyderata.

Fam. Siphuridae.

Genus Siphurus.

Siphurus Linnaeanus Etn.

Trans. Ent. Soc. London. 1871; Trans. Linn. Soc. London 1883—88; The Ent. Monthl. Mag. Lond. 1904
Siphurella Thomsoni Bengts. Lunds Univers. Årsskrift 1909.

Of this rare species, which was described from a single specimen in the Linnean Museum in London, and afterwards was found in numbers at Aal in Norway, there is a pinned specimen, ♂, without setae, in the collection (found at 29. VIII. 1909, on the river Longot-johan).

The specimen agrees very well with the description given by Eaton. The fore legs, dark yellowish brown, the hind legs yellowish white. All the femora with a dark distal band; knees dark, and the joinings of the tarsal joints with dark annulations. The venter of most segments with markings as shown in Fig. 3*b*.

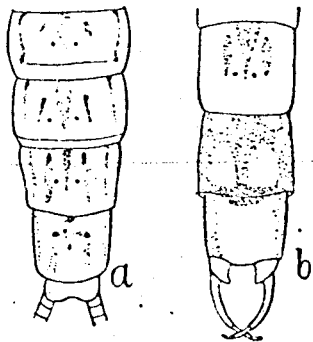


Fig. 3. *Siphylurus Linnaecanus* Eat. Ventral view. *a* Subimago, ♀, from Sweden. *b* Imago, ♂, from the river Longot-johan.

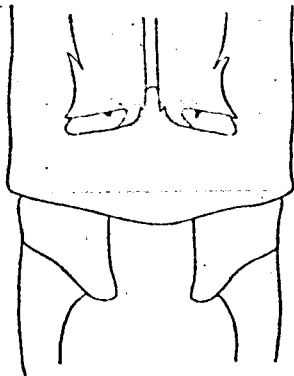


Fig. 4 *Siphylurus Linnaecanus* Etn. Dorsal view of penis and of basis of forceps.

When I have given *Siphylurella Thomsoni* as synonymous with the species of Eaton, it is according to a minute examination of original description and comparison with a couple of specimens, ♂ and ♀, subimagines from Småland, forwarded to me by Dr. S. Bengtsson.

I cannot follow S. Bengtsson in constituting a new genus on differences as to the proportional length of legs and tarsi within this genus. These variations, alluded to by Eaton (A Rev. Mon. of recent Ephem. or Mayfl. Lond. 1883—88 pag. 214), and also occurring, for instance, between *Siphylurus aestivalis* Etn. (*Siphyl. spinosus* Bengts.) and *Siphyluris lacustris* Etn. (*Siphyl. Zetterstedti* Bengts.), are of great specific but of no generic value. Regarding the shape of the penis the species is most allied to the *Siphylurus aestivalis*.

Siphylurus sp.

A single, defective specimen ♂, is present (found 25. VII. 09 at the Kara river). It is doubtless a new species.

Besides this there is a subimago ♀, in alcohol, which specimen cannot be referred to any of the previously described species. It is found 17. VIII. 09 at the Kara river.

Sparrea norvegica E.-Peters.

Deutsche Ent. Zeitschr. 1909. Tromsø Museums Aarshefter 31 og. 32. 1910.
Potameis elegans S. Bengtss. Lunds Univ. Årsskrift 1909.

The genus and species are based upon specimens from Karasjok in Norwegian Finmarken. Afterwards specimens have been found in Sweden. In the collection there is 1 pinned specimen from the tundra of Kara, 13. VII. 09 and 1 ♂, subimago, in alcohol, from the Kara river, 22. VII. 09.

After having read S. Bengtsson's description of the species and seen specimens from his collection, I have been convinced that *Potameis elegans* is the same as *Sparrea norvegica*.

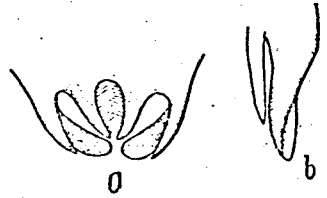


Fig. 5. *Sparrea norvegica* E.-Peters. ♂. —
 a Penis from above. b Penis from side.

Fam. Ametropidae.

Genus Ametropus Alb.

Ametropus fragilis Alb.

Albarda, Ent. Monthl. Mag. 1878; Eaton, A rev. Mon. of recent Ephem. or Mayfl. 1933—38.

As mentioned before, this species did not occur in the collection, but I have seen a single specimen, subimago, collected by Mr. Basile Bostanjoglo, Moscow, at the river Ular, 48 $\frac{1}{2}$ ° lat., Ural Government. The specimen has lost its legs and got the body accidentally compressed, but I am inclined to consider the specimen as a *A. fragilis*.

Genus Metretopus Etn.

Eaton, Ent. Monthl. Mag. 1901 pag. 253.

Bengtsson, Palaarktischen Ephemeriden, Lunds Univ. Årsskrift 1909.

The description of this genus and species was based upon specimens found in Norway. Later on examples were discovered in several places in Sweden.

I have several specimens before me. Dried and pinned: 2 ♂♂ and 1 ♀ imag., 1 ♀ subim. 23. VIII. 1909 from, Jenser-Keu. In alcohol: 1 ♂, imag. 14. VIII. № 256 from the river Nemsi-jaha; 1 ♀ subimag. 19. VIII. № 269 from the Pyderata river; 1 ♀ subim. 17. VIII. № 264 from the Pyderata river; 1 ♀ subim. 21. VIII. № 277 from the river Niada-jaha; 1 ♀ subim. 20. VIII from the Pyderata river.

Fam. Ecdyuridae.

Genus *Ecdyurus* Etn.*Ecdyurus hyalinus* sp. nov.

♂. Imago (dried). Thorax above dark brown, shining, with the sides paler. 1st, 9th and 10th segments dorsally dark brown; 8th segment dark brown in front, with a U-shaped, pale brown figure.

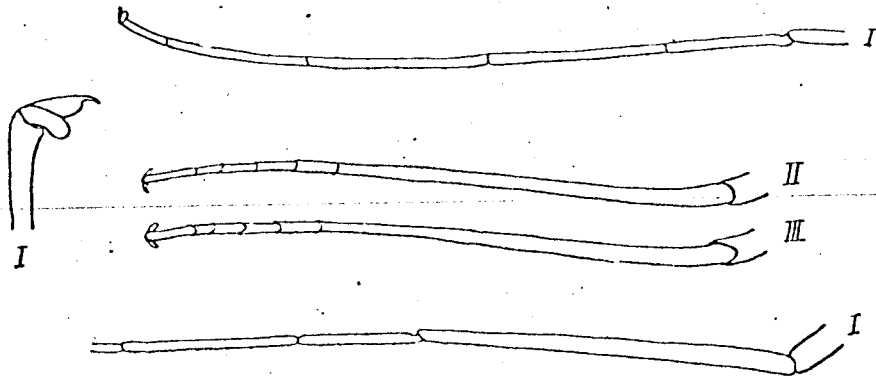


Fig. 6. *Ecdyurus hyalinus* sp. nov. Tibiae and tarsi of ♂.

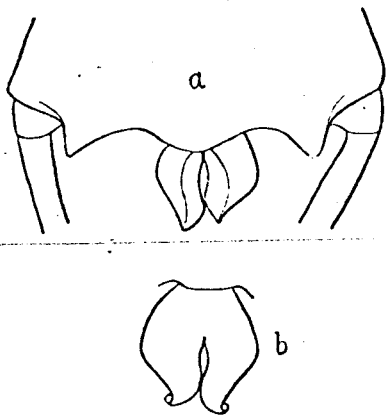


Fig. 7. *Ecdyurus hyalinus* sp. nov. a Apex of abdomen with penis from beneath. b Penis from above.

Segments 2 to 7 of abdomen colourless, water-clear and transparent. Apical border of each of segments 2 to 7 dorsally of a dark brown colour as the thorax. From the above mentioned dark border, at each side, two dark spine shaped figures, forming a U, are projecting forwards, reaching the middle of each segment. On the middle of abdomen, on most segments, two very narrow longitudinal, brown lines are perceptible. The pleura with a fine brown line; being darker at the distal end, especially in the 6th and 7th segments. Underside colourless. 8th and 9th segments with a flesh coloured tinge. On 8th segment are two longitudinal, short streaks at the base. Setae yellow brown, at the base with narrow darker annulations at the joinings. Legs yellowish brown; fore tarsi paler. All the femora with two dark brown

rings and with dark brown apex; all the tibiae with a dark brown ring at the tip and a paler one in the middle. Forceps yellow brown. Wings hyaline; longitudinal veins slightly darker than the membrane. Costa, subcosta and radius with a yellowish tinge. Pterostigmatic region with yellowish tinge, branched and anastomosed cross veinlets.

Length 11 mm.; fore wing 11,5 mm; setae 23 mm.

One specimen ♂, captured 17. VII. 1909 at the Kara river.

Easily recognized by its pale abdomen, dark ringed femora and tibiae and by its hyaline wings.

Genus *Heptagenia* Walsh.

Heptagenia bipunctata sp. nov.

♀. Imago (dried). Head pale yellow. Eyes greyish blue and with a short purple streak before their fore margin. Prothorax above pale yellow with two purple red longitudinal

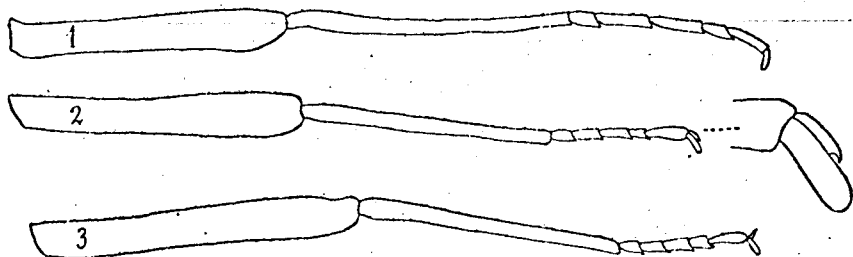


Fig. 8. *Heptagenia bipunctata* sp. nov. Legs of ♀.

bands, which are broadest behind. Meso- and metathorax above pale yellow with a faint purple red spot in front and with smaller spots of the same colour between the wings.

Abdomen above rich yellow and with a purple red longitudinal band, being narrower on the 8th segment and indistinct on the 9th and 10th.

On the dorsum of each segment at the side margins is a purple subtriangular spot, being prolonged and pointed in front, while at the hind margin it is so broad, that it touches the longitudinal middle band. But this is only the case with the spots on the 1st to

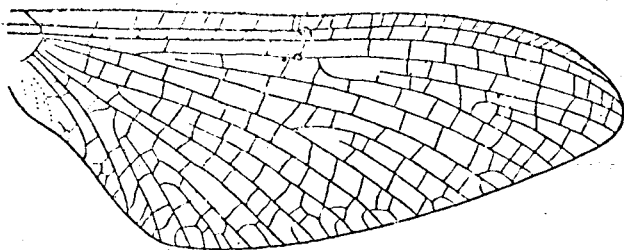


Fig. 9. *Heptagenia bipunctata* sp. nov. Fore wing of ♀.

5th segments; on the 6th to 8th segments they become gradually narrower, and on the 9th to 10th they are indistinct. Underside of the body rich yellow. Setae yellowish white with narrow, slightly reddish annulations at the joinings. Legs yellow; claws yellowish grey. Anterior femora with two purplish red bands, one in the middle and one at apex. Middle and hind femora with an indistinct brownish red ring towards apex. Wings hyaline with yellowish tinge. Fore wings in the marginal and submarginal areas tinged with rich yellow; in the pterostigmatic region the yellow colour has a reddish tint. The marginal area, in the hind wings, only tinged with yellow at the base. Longitudinal nervures light greyish yellow; the cross veins dark greyish yellow in the fore wings, paler in the hind wings. In the fore wing, in the middle of subcosta, is a larger, conspicuous, oblong, dark dot. A smaller one is placed just behind it on the subradius.

Length 12 mm.; fore wing 15,5 mm.; setae 20 mm.

In the collection was a female, preserved in alcohol, taken the 31. VIII. 1909 at the Obi river (Sango-pan).

Besides this one I have seen a ♀, collected by Mr. Basile Bostanjoglo in a valley at the Volga, near Moscow, 8. VI. 1909. The description is given from the last named specimen.

It is a fine and conspicuous species, easily recognized by its strongly pronounced purplish red colour and by the two dots on subcosta and subradius.

B. Larvae.

Baëtis sp. 1.

Nymph. Light reddish brown. Head and thorax, with a fine pale median line. A few darker spot are visible on the upper side of thorax and abdomen. Underside unicolourous. Femora slightly darker than tibiae and tarsi. Middle seta most often the shorter. Antennae dark at the base, paler towards apex. Length 7—8 mm.; setae 5 mm. Several specimens present.

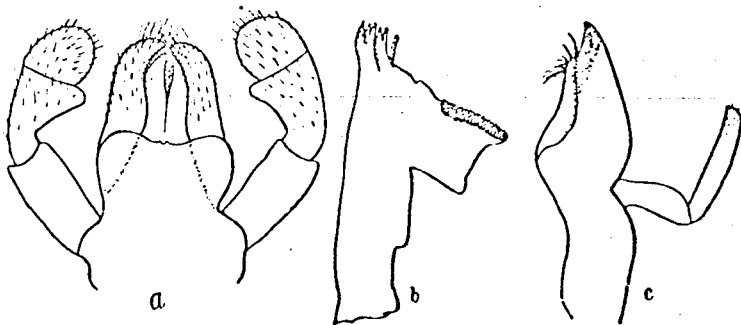


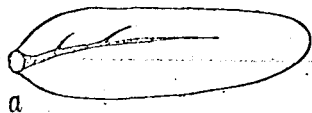
Fig. 10. *Baëtis larva* I. a Labium, b left mandible, c left maxilla.

9. VIII. 09 № 89, at the Talota river; 3. VIII. 09 № 93, at the tundra of Kara; 20. VIII. 09 № 274, on the Pyderata river; 27. VIII. 09 № 69 on the Stschutschja river.

The nymph is readily recognized by its very long tracheal gills, and it is quite probable that it belongs to *Baëtis vernus* Curt.

Baëtis sp. II.

Nymph. Regarding the shape of the mouthparts it is much like *Baëtis I*, but it differs from it by its shorter tracheal gills. Greyish. Head and thorax with a fine, pale median line. The borders of the abdominal segments — as a rule also those of the venter — darker. Middle seta considerably shorter than the two others. Length 4,5—5,5 mm.; setae 3,5 mm.



a



b

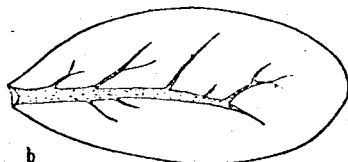


c

Fig. 11. *Baëtis larva I*. Tracheal gills. a 7th gill, b 4th gill, c 1st gill.



a



b



c

Fig. 12. *Baëtis larva II*. Tracheal gills. a 7th gill, b 4th gill, c 1st gill.

Several specimens present.

7. VII. 09. № 212, near mount Minisej; 9. VIII. 09 № 89, on the Talota river.

Sparrea norvegica E.-Peters.

As Bengtsson has described the larva, I only give a short description.

Nymph. Parallel sided. Head a little narrower than mesothorax. Upperside light brown, underside paler. Round the eyes a pale ring.

Overside of thorax and abdomen with several pale spots.

Antennae yellowish white, long and slender. Legs yellowish white and not densely haired. Setae of equal length, yellowish and with indistinct annulations at the joinings; the two uttermost hairy on their innerside, the middle one on both sides. Hair dark. Hind angles of 5th to 9th segments produced into short, broad and spiny teeth. 7 pairs of single tracheal gills on each of the 1st to 7th segments.

Length 10 mm.; setae 5 mm.

The characteristic shape of the mouthparts indicates that the genus must be placed near the *Ameletus*.

2 specimens are in the collection. 5. VII. 09 № 33, near mount Minisej.

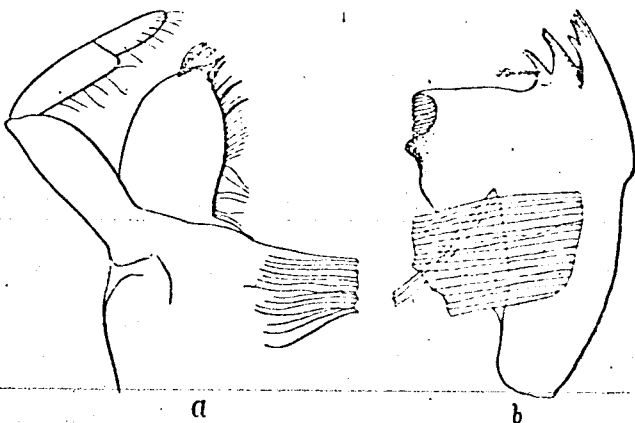


Fig. 13. *Sparrea norvegica* E.-Peters. Nymph. a left maxilla, b left mandible.

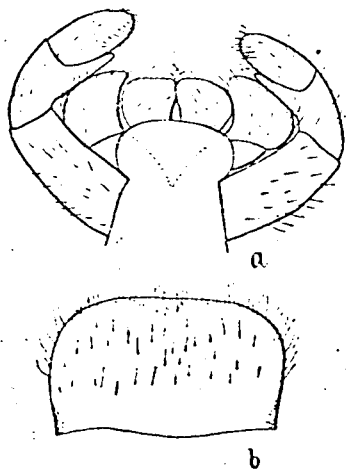


Fig. 14. *Sparrea norvegica* E.-Peters. Nymph. a Labium, b Labrum.

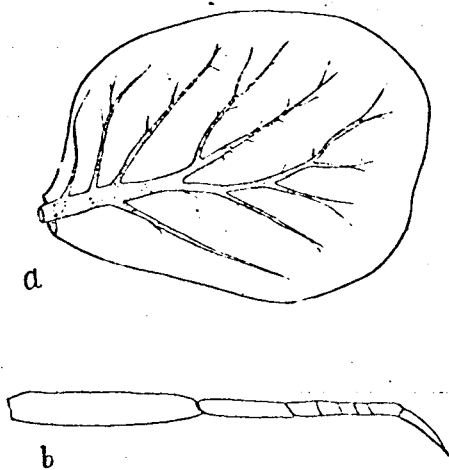


Fig. 15. *Sparrea norvegica* E.-Peters. Nymph. a 4th tracheal gill, b Hind leg.

Siphurus aestivalis Etn.

Eaton, Ent. Monthl. Mag. London 1903.

Siphurus spinosus Bengtsson, Paläarktischen Ephemeriden, Lund. 1903.

A single larva was found. It agrees in all parts completely with the larva from Denmark, 15. VII. 09 № 49, at the tundra of Kara.

Siphurulus sp.

5 larva were found of a species of *Siphurulus*. I do not venture to regard them as belonging to any of the known imagines. I have seen the larva of *Siphurulus Linnacanus* from Sweden.

22. VII. 09 № 62, near the mouth of the Kara river.

Metretopus norvegicus Eat.

The larva of this species also is described by Bengtsson.

Nymph. Head small, only half as wide as the mesothorax. Ocelli large; front greyish yellow with yellow middle line. Thorax, wing sheaths and abdomen grey-yellow. On thorax a few small brownish dots are present. On the wing sheaths is seen a dark line following

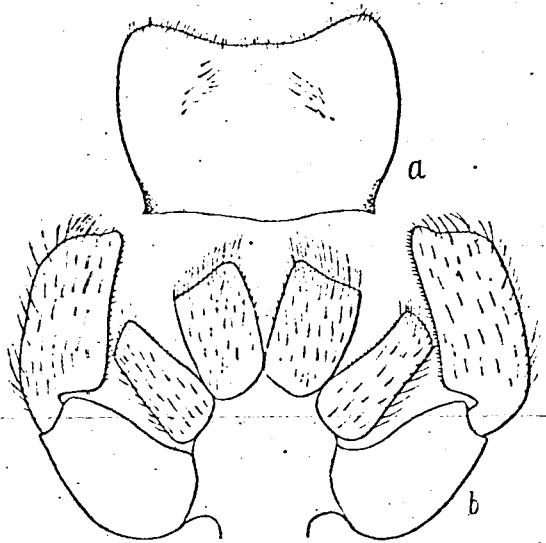


Fig. 16. *Metretopus norvegicus* Eat. Nymph. a Labrum, b Labium.

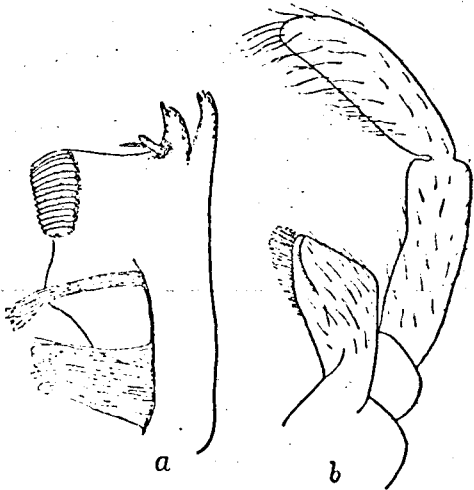


Fig. 17. *Metretopus norvegicus* Eat. Nymph. a Left mandible, b Left maxilla.

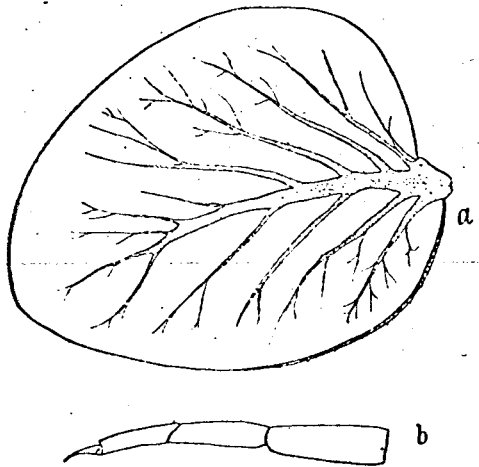


Fig. 18. *Metretopus norvegicus* Eat. Nymph. a 7th tracheal gill, b Hind leg.

the median nervure till the point where this is forked. Abdomen above with several, smaller and larger, brownish spots. Venter pale greyish yellow. Antennae, legs and setae pale greyish yellow. The middle joints of setae dark brown on the sides. Hind angle of segments terminating in a long, spiny tooth. Antennae thin and short. Setae equal in length; the two uttermost hairy on their inner side, the middle one on both sides. 7 pairs of nearly uniform tracheal gills being each apically broadly rounded and only with few tracheal branches. Length 13—14 mm.; setae 5 mm.

The larva is slender and much like the *Baëtis* larva. A series of larva, in the nymphal stage, were present.

1. VIII. 09 № 89, at the tundra of Kara; 16. VIII. 09 № 262, on the Pyderata river; 21. VIII. 09 № 277 on the river Niada-jaha.