

THE MAYFLIES OF HUNGARY,
WITH THE DESCRIPTION OF A NEW SPECIES,
Baëtis pentaphleboodes sp. n.
(EPHEMEROPTERA)

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Compared to that of the neighbouring states, relatively few data are available on the mayfly fauna of Hungary. Whereas more than 60 species are known from the territory of both Roumania and Czechoslovakia, literature demonstrated merely 38 mayfly species from Hungary. In fascicle 5 (Mayflies — Ephemeroptera), volume V, of our Fauna Hungariae, published in 1959, I have listed 46 species as shown from Hungary, based partly on literature, partly on my own collectings, but my own locality data had not yet been published in details. Since that time, there accumulated a number of supplementary data, and my observations concerning a new *Baëtis* species also became ripe for publication; I thus deem a summary of our recent knowledge of our Ephemeropteran fauna justified for publication.

In the list of species, I submit also references to literature by a serial number. If no such data are given, the species is new for our fauna. I omit the locality data of the more common species, giving only those which refer to sporadic occurrences. Earlier identifications cannot be controlled, since, unfortunately, the verificatory specimens had been annihilated in the Collection of the Hungarian Natural History Museum in 1956. All data listed below, refer, with two exceptions, to specimens preserved in my collection, regardless of the collector. The two exceptions are *Siphonurus aestivalis* EAT., and *Leptophlebia vespertina* L., which I have listed on the basis of data checked and recorded by me prior to the destruction of the Museum's collection. Concerning collector data, I mark my name with Ú., that of a light trap of the National Light Trap Network, by lt.

List of species

Family 1: PALINGENIIDAE

1. *Palingenia longicauda* OLIV. — 1, 2, 6, 10.

Family 2: POLYMITARCIDAE

2. *Polymitarcis virgo* OLIV. — 1, 7; Kállósemjén, 19 July, 1960, leg. lt; Pacsa, 30 August, 1960; leg. lt; Szederkény, 14 August, 1960, leg. lt.; Tanakajd, 29 July, 1960, leg. lt.

Family 3: POTAMANTHIDAE

3. *Potamanthus luteus* L. — 1, 6, 8; Diósjeuő, 2 July, 1944, leg. Ú.

Family 4: EPHEMERIDAE

4. *Ephemera danica* MÜLL. — 1, 4, 5, 6. Everywhere frequent in June and July in the brooks of the Central Range.
 5. *Ephemera lineata* EAT. — 1, 3.
 6. *Ephemera vulgata* L. — 1, 2. The species occurs in many localities, in the slower moving brooks and rivers of the plains.

Family 5: SIPHLONURIDAE

7. *Siphonurus aestivalis* EAT. — Budapest, 24 May, 1924, leg. GY. FEKETE; Hortobágy, 18 May, 1942, leg. Z. SZILÁDY; Kőszeg, 9 June, 1940, leg. VISNYA. The known specimens of this taxon were in the destroyed collection of the Natural History Museum, Budapest.
 8. *Siphonurus armatus* EAT. — 1, 2; Lenti, 11 May, 1960, leg. Á. KÁROLYI; Tard, 16 May, 1959, leg. Ú.
 9. *Siphonurus lacustris* EAT. — Garadna valley, Mts. Bükk, 31 May, 1941, leg. Ú.
 10. *Isonychia ignota* WALK. — 1.

Family 6: BAËTIDAE

11. *Baëtis bioculatus* L. — 1, 2; Rómaifürdő, 6 Oct., 1943, leg. Ú; Veresegyház, 25 Oct., 1953, leg. Ú; Zebegény, 29 May, 1955, leg. Ú.
 12. *Baëtis pentaplebodes* sp. n. — Veresegyház, 22 April, 1956; 27 April, 1958; 11 April, 1965, leg. Ú.
 13. *Baëtis pumilus* BURM. — Aszófő, 29 Oct., 1957, leg. Ú; Mátrafüred, 29 May, 1954, leg. Ú.
 14. *Baëtis rhodani* PICT. — 2, 5, 6. Inhabiting most of the brooks of the Central Range.
 15. *Baëtis vernus* CURT. — Aszófő, 30 August, 1957, leg. Ú; Bernece, 29 July, 1958, leg. Ú; Veresegyház, 27 June, 1954, leg. Ú.
 16. *Cloëon dipterum* L. — 1, 2, 3, 6. Frequent in the whole country.
 17. *Cloëon inscriptum* BGTSS. — Szentmargitfalva, 20 August, 1958, leg. T. Pócs.
 18. *Cloëon rufulum* MÜLL. — 1, 3; Bernece, 27 July, 1958, leg. Ú; Zebegény, 10 Oct., 1943, leg. Ú.
 19. *Cloëon simile* EAT. (= *praetextum* BGTSS.) — Csorna, 3 Sept., 1957, leg. H. STEINMANN; Iharosberény, 6 Sept., 1957, leg. H. STEINMANN; Veresegyház, 2 Oct., 1955, leg. Ú.
 20. *Procloëon bifidum* BGTSS. — Szakonyfalu, 18 August, 1957, leg. Ú.
 21. *Centroptilum luteolum* MÜLL. — 1; Tard, 30 April, 1959, leg. Ú; Zebegény, 10 Oct., 1943, leg. Ú.
 22. *Centroptilum pennulatum* EAT. — 6; Bernece, 29 July, 1958, leg. Ú; Királyháza, Mts. Börzsöny, 25 August, 1954, leg. Ú; Szentendre, 30 July, 1943; 18 Oct., 1953; 26 Sept., 1954, leg. Ú; Veresegyház, 12 Sept., 1954, leg. Ú.

Family 7: OLIGONEURIIDAE

23. *Oligoneuriella rhenana* IMH. — 1; Nagytétény, 8 August, 1961, leg. lt; Kállósemjén, 6 July, 1961, leg. lt; Sopronhorpács, 7 July, 1960, leg. lt; Tanakajd, 3 July, 14 August, 1961, leg. lt.

Family 8: AMETROPODIDAE

24. *Ametropus fragilis* ALBDA. — 1.

25. *Metreletus hungaricus* ÚJH. — 9; Erdőbénye, 6 June, 1962, leg. P. TALLÓS.

Family 9: HEPTAGENIIDAE

26. *Epeorus assimilis* EAT. — It is highly interesting that this species, frequent in May—June, had not hitherto been captured by the earlier collectors. We have no data, though it is common in the Mts. Pilis, Börzsöny, Mátra, Bükk. Sátor, and it probably occurs also in other Hungarian mountains.

27. *Ecdyonurus forcipula* KOLLAR-PICT. — 3.

28. *Ecdyonurus helveticus* EAT. — 6. The author himself considers his own datum, from the Mts. Mátra, as uncertain.

29. *Ecdyonurus lateralis* CURT. (= *Heptagenia lateralis* CURT.). — Nor is this species recorded in literature, though it is frequent from the middle of April to the middle of May, in the Mts. Pilis and Börzsöny.

30. *Ecdyonurus subalpinus* KLP. — Aszófő, 29 August, 1957; 10 August, 1958, leg. Ú.

31. *Ecdyonurus venosus* F. — 3, 6. Common in our mountainous districts. The study of the biology, larval and subimaginal stages of the animals allegedly belonging to this species would probably reveal different taxa.

32. *Heptagenia coerulans* ROST. — 3.

33. *Heptagenia flava* ROST. — 1, 2; Baj, 13 August, 1960, leg. lt; Pacsa, 30 August, 1960, leg. lt; Romhány, 16 July, 1944, leg. Ú; Velence, 15 June, 1960, leg. lt.

34. *Heptagenia longicauda* STEPH. (= *flavipennis* DUF.). — 1, 4.

35. *Heptagenia sulphurea* MÜLL. — 1, 3, 7. Frequent along the Danube.

36. *Rhithrogena germanica* EAT. — 1. The datum is dubious.

37. *Rhithrogena semicolorata* CURT. — 3, 4, 6. Frequent in our mountainous districts.

Family 10: LEPTOPHLEBIIDAE

38. *Leptophlebia marginata* L. — 3.

39. *Leptophlebia vespertina* L. — There were some specimens labelled "Cuha valley, Mts. Bakony" in the destroyed collection of the Natural History Museum.

40. *Paraleptophlebia cincta* RETZ. — 1; Kőkapu, Mts. Sátor, 10 June, 1958, leg. Ú.

41. *Paraleptophlebia submarginata* STEPH. — 1; Mátrafüred, 16 May, 1954, leg. Ú; Kemence brook, Mts. Sátor, 1 June, 1957, leg. Ú.

42. *Paraleptophlebia wernerii* ULM. — 7; Tard, 1 May, 1959, leg. Ú; Tard, 16 May, 1959, leg. S. TÓTH.

43. *Habrophlebia fusca* CURT. — 5. Contrarily to the single known locality Pécs, it occurs probably in the entire Transdanubian area. Bakonybél, 15 July, 1958, leg. Ú; Cuha valley, 19 June, 1955, leg. Ú; Sopron, 10 July, 1954, leg. Ú; Szakonyfalu, 18 August, 1957, leg. Ú.

44. *Habrophlebia lauta* Mc L. — 6; Bernece, 27 July, 1958, leg. Ú; Kemence brook, Mts. Sátor, 1 June 1957, leg. Ú; Kőkapu, Mts. Sátor, 10 June, 1958, leg. Ú; Szentendre, 16 June, 1944, 8 Oct., 1962, leg. Ú; Visegrád, 22 July, 1953, leg. Ú; Zebegény, 7 July, 1944, leg. Ú.

45. *Habroleptoides modesta* HAG. — Astonishingly, this species is not listed in literature, though it is frequent in early spring in our mountainous districts. My earliest datum is: 10 April, 1950, and the latest: 1 June, 1944 and 1955.

Family 11: EPHEMERELLIDAE

46. *Ephemerella ignita* PODA — 1, 3; Bakonybél, 19 July, 1958, leg. Ú; Felsőtárkány, 9 July, 1961, leg. lt; Jósvalfő, 18—20 August, 1959, leg. Ú; Királyháza, Mts. Börzsöny, 25 August, 1954, leg. Ú; Sopronhorpács, 10 June, 1960, leg. lt; Szakonyfalu, 12 August, 1957, leg. Ú; Szentendre, 16 June, 1944, leg. Ú; Tanakajd, 17 June, 1960, leg. lt; Visegrád, 22 July, 1953, leg. Ú.

47. *Torleya major* KLP. — I collected only the larval stage of this species: Kőkapu, Mts. Sátor, 1, 11 May, 1958, leg. Ú.

Family 12: PROSOPISTOMATIDAE

48. *Prosopistoma foliaceum* FOURC. — The larvae of this species were collected by DR. A. KESSELYÁK, in September, 1942, first in the mouth of the river Maros near Szeged, and later also in the Tisza. He gave a lecture on the occurrence of this animal in Hungary,

in the Zoological Section of the Hungarian Natural History Society, but his untimely death prevented the publication of his findings. I have 5 larvae of his material, collected in Szeged in 1943, in my collection.

Family 13: CAENIDAE

49. *Caenis horaria* L. — Barbaes, 9 August, 1953, leg. Ú; Hódmezővásárhely, 13 August, 1960, leg. lt; Kállósmjén, 11 July, 1960, leg. lt; Kenderes, 26 May, 1960, leg. lt; Kismegyer, 6 August, 1960, leg. lt; Kompolt, 15 August, 1960, leg. lt; Martonvásár, 4 June, 1960, leg. lt; Miskolc, 3 June, 1960, leg. lt; Tarhos, 6 August, 1960, leg. lt; Velence, 4 June, 1960, leg. lt.

50. *Caenis macrura* STEPH. — 1, 3; Bernece, 27 July, 1958, leg. Ú; Dömös, 8 Sept., 1957, leg. Ú; Királyháza, Mts. Börzsöny, 17 August, 1954, leg. Ú.

51. *Caenis robusta* EAT. — 1.

Of the 51 species listed above, and discounting the preliminary publication of some taxa mentioned above, 13 were not yet shown from our fauna. One of the thirteen, *Prosopistoma foliaceum*, had been discussed by KESSELYÁK in a lecture.

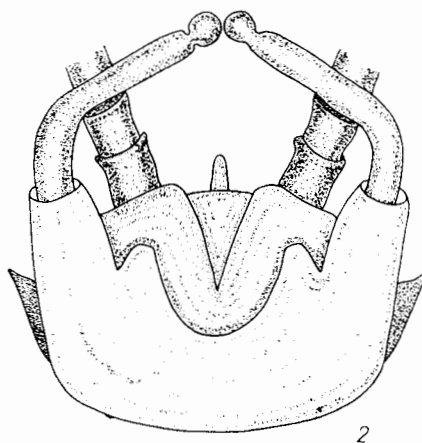
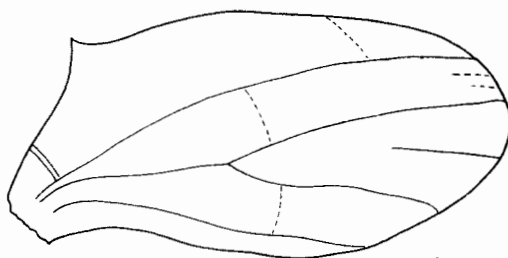
***Baëtis pentaplebodes* sp. n.**

(Figs. 1—3)

♂. -- Head, dorsal side of meso- and metathorax chocolate brown. Compound eyes semispherical, black, ocelli oval, their diameter (parallel with corporeal axis) twice as long as transversal one. Ocelli dark brown in living animal, tending to orange red in those preserved in alcohol. Prothorax ventrally and meso- and metathorax laterally light brown. Legs, venation and dorsal side of median abdominal segments also light brown. All these light brown parts, however, becoming colourless in alcohol. Pinned animals retain their colour. On abdominal tergites, discoloured in alcohol, two comma-shaped spots followed by two dots medially; this pattern hardly discernible on pinned specimens. Fore wing of a shape and venation of *Baëtis* taxa. 9—10 cross veins between costa and subcosta in apex of wing. Shape of hind wing (Fig. 1) not differing from those of *Baëtis* species, resembling that of *B. rhodani*, but its venation characteristic and easily distinguishable from that of its known congeners. Three longitudinal veins present, with second vein branching. Usually a longitudinal vein also present in outer portion of wing, between longitudinal veins 2 and 3, terminating mostly blind proximally, or joining (in some specimens) longitudinal veins 2 or 3, or very rarely both. Wing with varying numbers of cross veins, best discernible in transmitted light: namely one between costa and longitudinal vein 1, one between longitudinal vein 1 and anterior branch of longitudinal vein 2, and one between posterior branch of longitudinal vein 2 and longitudinal vein 3. Occasionally another veinlet present between longitudinal veins 1 and 2. Fore leg rather short, not reaching apex of fore wing. Longest joint tibia, femur and tarsus about equally long. First tarsal joint longest, second shorter, third even

shorter, and fourth shortest. Last two abdominal segments of male dark brown above, colourless in alcohol. When seen from below, inner side of basal joint of gonopodium (Fig. 2) with a protuberance. Joint 2 curving inwards beyond a short, straight section, last joint almost spherical. First 3 joints of cerci brown, others gradually lightening to brownish-white.

Length of body: 7–9, length of fore wing: 7–8, length of cerci: 13–15 mm.



Figs. 1–2. *Baëtis pentaplebodes* sp. n. 1 = right hind wing. 2 = abdominal end of male from below

Holotype: male imago in alcohol, larva collected 11 April, 1965, Veresegyház, hatched from larva on 12 April, subimago molted 13 April. **Paratypes:** 2 male imagos in alcohol, bred from larvae collected as Holotype; 11 male and 1 female imagos, pinned, collected 22 April, 1956, Veresegyház; 5 male imagos, pinned, collected 27 April, 1958, Veresegyház. Types in my collection.

♀. — Highly resembling male, but colour slightly lighter brown, less discolouring in alcohol, also legs remaining brown. Longest joint of leg:

femur, tibia shorter, tarsus shortest. Shortest tarsal joint 3, joint 2 longer, joint 1 still longer, joint 4 longest.

Length of body: 8—9, length of fore wing 8—9, length of cercus: 15 mm.

Allotype: female preserved in alcohol, collected as larva on 11 April, 1965, Veresgyház, hatched from larva on 16 April, molted from subimago on 17 April.

S u b i m a g o: colour light brown, resembling that of female imago, wing unicolourous, intransparent greyish-brown. Length of body: 10, length of fore wing: 8, length of cerci: 11 mm. Two subimagos hatched from larvae collected together with type material.

L a r v a: Mature larva light brown, shape corresponding to that of other *Baëtis* larvae. Light brown colour tending to a darker shade on day preceding molting. On male larvae, ocelli appearing in dark brown colour, turning to reddish-brown in alcohol. Alar sheath of males becoming nearly black prior to molting. Prothorax, mesothorax, and on bases of alar sheaths an irregular darker pattern. Posterior margin of abdominal segments with a thin, dark line, disappearing during darkening before hatching. Medially of segments a slightly lighter stripe, interrupted by dark posterior margins of segments. Segments also with a light V-shaped pattern, open posteriorad, backed caudally also by two light dots; pattern discernible especially on first five tergites. Abdomen ventrally coloured as dorsally, segmental margins with a dark line each, decurrent parallel with longitudinal axis of body. Antennae and cerci coloured as body, terminal filum slightly lighter. Colour of legs also agreeing with that of body. Oral organs of larva shown on figure 3. Seven oval tracheal gills on first seven abdominal segments, not differing from usual gill-construction of *Baëtis* larvae.

Length of body: 9—12, length of cercus: 7, length of terminal filum: 5 mm.

O c c u r r e n c e a n d l i f e h a b i t s. I found the species only in Veresgyház, Hungary. Two brooks flow in wet meadows toward the lake of Veresgyház, confluent about 1 km before reaching the lake. Along this section, the brook is rather rapid and about 1 m deep in its middle in spring. I found the larvae in this reach of the brook, and invariably in the deep water, on *Typha* and *Phragmites* leaves floating in the direction of the current. These leaves are dead remnants of the vegetation of the preceding year, and are mostly covered with algae. It was only very rarely that I found specimens on the leaves of green plants, and then *Myosotis*, nearer to the banks of the brook. I found the imagos above the meadows surrounding this section, in the second half of April. They were swarming also in the forenoon on cloudy days. No imagos were found in May.

R e a r i n g o f l a r v a e. I collected about 50 larvae on 11 April, 1965, in the above mentioned site, transporting them to Budapest in a vessel containing one liter of water taken

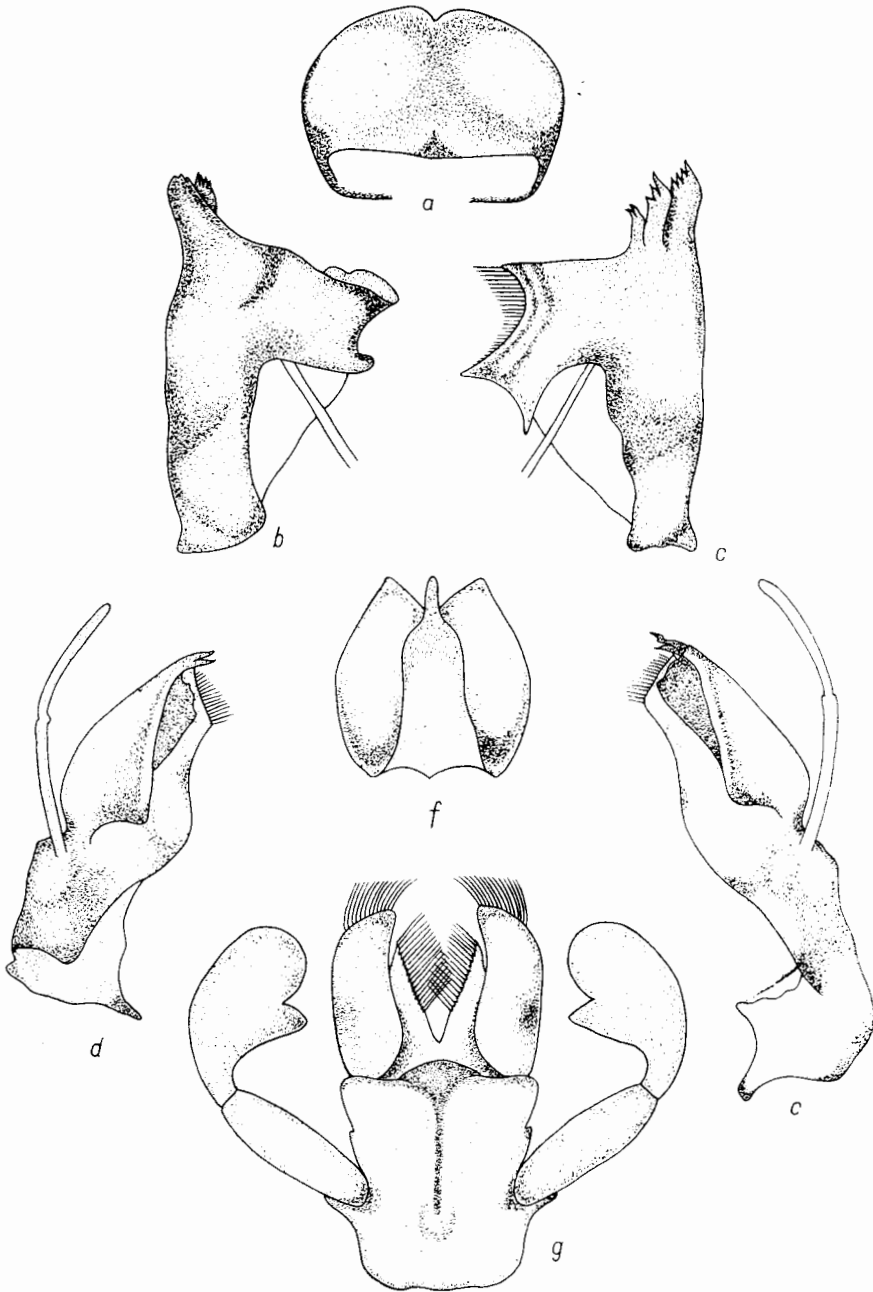


Fig. 3. *Baëtis pentaplebodes* sp. n., larval oral organs: a = labrum, b = mandibula sinistra, c = mandibula dextra, d = maxilla sinistra, e = maxilla dextra, f = hypopharynx, g = labium

from the brook, and also some decaying *Typha* and *Phragmites*, as well as green leaves, serving for the habitat of the larvae. The larvae tolerated the journey (3–4 hours) rather well. In the laboratory, I made three subgroups. One of them were placed in a 1 liter vessel with current tap-water, together with a portion of the reed and bulrush leaves. The temperature of the water was invariably 14.8 C°. These larvae died in 24 hours, probably due to the chlorine content of the water. A smaller part of the larva, about 10 specimens, were left in the original brook-water, among *Cabomba* and other green, aquatic plants. Also these larvae perished in 24 hours. I left the third subgroup, about 20 specimens, also in the original brook-water, but with a perfusion of a rather strong current of air rich in oxygen, through a capillary tube. The temperature of the water was constantly 20.4 C°. Of these larvae, there hatched 1 male subimago on 12 April, 4 males on 13 April, and 1 female on 16 April; the other larvae perished. The subimagos molted into imagos always within 24 hours. I preserved 2 subimagos in alcohol, and put the molted imagos also in alcohol.

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