A CATALOG OF THE MAYFLIES (EPHEMEROPTERA) OF HONG KONG

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This paper is a catalog of the Ephemeroptera known from the British Crown Colony of Hong Kong. It includes all known references for each species, along with an indication of the type localities and depositions of type specimens. For each reference the stage (male, female, or nymph) is indicated if relevant. Keys which include the species also are indicated. The recorded distribution for each species is listed. For each genus are given the reference to the original description, information on the type species, and any synonyms.

Abbreviations of places of type deposition are as follows: (BMNH), British Museum (Natural History), London; (Cornell), Cornell University, Ithaca, New York; (DEI), Deutsches Entomologisches Institut, Eberswalde; (Hamburg), Zoologisches Staatsinstitut und Zoologisches Museum, Hamburg; (Hsu), personal collection of Y.-C. Hsu [the late Prof. Hsu indicated (personal communication) that because of events in China over the past few decades these specimens should be considered destroyed or lost]; (Utah), University of Utah, Salt Lake City.

Although the taxonomic knowledge of the Hong Kong mayflies is still somewhat sketchy, there are substantial ecological studies ongoing at this time. Therefore, in order to facilitate future studies and comparisons of data, I have included in this catalog the "morphospecies" of Dudgeon (1982a, b, 1983, 1984a, b). The reader should be aware that many of the taxonomic assignments of these morphospecies are preliminary and actual placement will have to await future taxonomic studies.

This paper is one in a continuing series of catalogs of the Ephemeroptera (cf. Hubbard & Peters 1978, Hubbard & Pescador 1978, Hubbard & Savage 1981, Hubbard 1982a,b).

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Order **Ephemeroptera**

Family **Baetidae** Leach, 1815

Subfamily **Baetinae** Leach, 1815

Genus **Baetis** Leach, 1815

Baetis Leach, 1815:137.
Type species: **Ephemera fuscata** Linnaeus. Subsequent designation by Intern. Comm. Zool. Nomencl., 1966:209.

Brachyphlebia Westwood, 1840:25.
Type species: **Ephemera fuscata** Linnaeus (misidentified as **Ephemera bioculata**) [c.f. Intern. Comm. Zool. Nomencl., 1966:209]. Monotypic.

Acentrella Bengtsson, 1912:110.
Type species: **Acentrella laponica** Bengtsson. Monotypic.

Heterocloeon McDunnough, 1925:175.
Type species: **Centroptilum curiosum** McDunnough. Original designation.

Baetis sp. T_1

Baetis T_1 Dudgeon, 1982:14.
Baetis T_1 Dudgeon, 1982:225.
Baetis T_1 Dudgeon, 1983:441.
Baetis T_1 Dudgeon, 1984:73.
Baetis T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. T_2

Baetis T_2 Dudgeon, 1982:14.
Baetis T_2 Dudgeon, 1982:225.
Baetis T_2 Dudgeon, 1983:441.
Baetis T_2 Dudgeon, 1984:73.
Baetis T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. T_3

Baetis T_3 Dudgeon, 1982:14.
Baetis T_3 Dudgeon, 1982:225.
Baetis T_3 Dudgeon, 1983:441.
Baetis T_3 Dudgeon, 1984:73.
Baetis T_3 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. T_4

Baetis T_4 Dudgeon, 1982:225.
Baetis T_4 Dudgeon, 1983:441.
Baetis T_4 Dudgeon, 1984:73.

Baetis T_4 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. T_5
Baetis T_5 Dudgeon, 1984:73.
Baetis T_5 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. L_5
Baetis L_5 Dudgeon, 1984:73.
Baetis L_5 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. L_6
Baetis L_6 Dudgeon, 1984:73.
Baetis L_6 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. L_7
Baetis L_7 Dudgeon, 1984:73.
Baetis L_7 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. L_8
Baetis L_8 Dudgeon, 1984:73.
Baetis L_8 Dudgeon, 1984:210.
Distribution: Hong Kong.

Baetis sp. cf. T_3
Baetis cf. T_3 Dudgeon, 1984:73.
Baetis cf. T_3 Dudgeon, 1984:210.
Distribution: Hong Kong.

Subfamily **Cloeoninae** Newman, 1853

Genus **Centroptilum** Eaton, 1869
Centroptilum Eaton, 1869:132.
Type species: **Ephemera luteola** Müller. Original designation.

Centroptilum sp. L_1
Centroptilum L_1 Dudgeon, 1984:73.
Centroptilum L_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Genus **Cloeon** Leach, 1815
Cloeon Leach, 1815:137.
Type species: **Ephemera diptera** Linnaeus as **Cloeon pallidus** Leach. Monotypy.
Cloe Burmeister, 1839:797. [unjustified emendation of **Cloeon** Leach].
Type species: **Ephemera diptera** Linnaeus, objective synonymy.
Cloeopsis Eaton, 1866:146.
Type species: **Ephemera diptera** Linnaeus. Monotypy.
Austrocloeon Barnard, 1932:217. [nomen nudum].
Neocloeon Traver, 1932:365.
Type species: **Neocloeon alamance** Traver. Original designation.
Austrocloeon Barnard, 1940:616.
Type species: **Cloeon africanum** Esben-Petersen. Original designation.

Cloeon harveyi Kimmins
Procloeon harveyi Kimmins, 1947:94, fig. 2, 6, 10. (male, female). Type: female, Calcutta, Bengal (BMNH).
Procloeon harveyi - Gillies, 1949:176.
Procloeon harveyi - Kimmins, 1971:314.
Procloeon harveyi - Hubbard & Peters, 1978:11.
Procloeon harveyi - Hubbard & Srivastava, 1984:3.
Cloeon harveyi - Müller-Liebenau & Hubbard, 1986:538.
Distribution: Hong Kong, Malaysia, India.

Genus **Pseudocloeon** Klapálek, 1905
Pseudocloeon Klapálek, 1905:105.
Type species: **Pseudocloeon kraepelini** Klapálek. Monotypic.
Baetiella Uéno, 1931:220.
Type species: **Acentrella japonica** Imanishi. Original designation.

Pseudocloeon sp. T_1
Pseudocloeon T_1 Dudgeon, 1982:14.
Pseudocloeon T_1 Dudgeon, 1982:225.
Pseudocloeon T_1 Dudgeon, 1983:441.
Pseudocloeon T_1 Dudgeon, 1984:73.
Pseudocloeon T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Pseudocloeon sp. T_2
Pseudocloeon T_2 Dudgeon, 1982:14.
Pseudocloeon T_2 Dudgeon, 1982:225.
Pseudocloeon T_2 Dudgeon, 1983:441.
Pseudocloeon T_2 Dudgeon, 1984:73.
Pseudocloeon T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Pseudocloeon sp. L_3
Pseudocloeon L_3 Dudgeon, 1984:73.
Pseudocloeon L_3 Dudgeon, 1984:210.
Distribution: Hong Kong.

Pseudocloeon sp.
Baetella [sic] T_1 Dudgeon, 1983:441.
Distribution: Hong Kong.

Family **Caenidae** Newman, 1853

Genus **Caenis** Stephens, 1835
Caenis Stephens, 1835:60.
Type species: **Caenis macrura** Stephens. Subsequent designation by Westwood, 1840:47.
Oxycypha Burmeister, 1839:796.
Type species: **Oxycypha luctuosa** Burmeister. Subsequent designation by Jacob,

1974:96.
Ordella Campion, 1923:518.
Type species: **Caenis macrura** Stephens. Original designation.

Caenis sp. T_1
Caenis T_1 Dudgeon, 1982:14.
Caenis T_1 Dudgeon, 1982:225.
Caenis T_1 Dudgeon, 1984:73.
Caenis T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Caenis sp. T_2
Caenis T_2 Dudgeon, 1983:441.
Caenis T_2 Dudgeon, 1984:73.
Caenis T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Caenis sp. L_2
Caenis L_2 Dudgeon, 1984:73.
Caenis L_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Caenis sp. L_3
Caenis L_3 Dudgeon, 1984:73.
Caenis L_3 Dudgeon, 1984:210.
Distribution: Hong Kong.

Family **Ephemeridae** Latreille, 1810

Genus **Ephemera** Linnaeus, 1758
Ephemera Linnaeus, 1758:546.
Type species: **Ephemera vulgata** Linnaeus. Subsequent designation by Westwood, 1836:439.
Nirvius Navás, 1922:56.
Type species: **Nirvius punctatus** Navás. Original designation.

Subgenus **Ephemera** Linnaeus, 1758

Ephemera (Ephemera) pulcherrima Eaton
Ephemera pulcherrima Eaton, 1892:185. (female). Type: female, Tenasserim Valley, Burma (BMNH).
Ephemera pulcherrima - Ulmer, 1926:86, fig. 80-81. (male, key).
Ephemera pulcherrima - Lestage, 1927:99. (key).
Ephemera pulcherrima - Wu, 1935:248.
Ephemera pulcherrima - Hsu, 1936:233, fig. 1. (female).
Ephemera pulcherrima - Ulmer, 1936:204.
Ephemera pulcherrima - Hafiz, 1937:368.
Ephemera pulcherrima - Hsu, 1937:433, fig. 25-26. (male, female, key).
Ephemera pulcherrima - Kimmins, 1960:308.
Ephemera pulcherrima - Kimmins, 1971:319.
Ephemera pulcherrima - Hubbard & Peters, 1978:17.
Distribution: Hong Kong, China, Burma, India.

Ephemera (Ephemera) serica Eaton
Ephemera serica Eaton, 1871:75, pl. 4 fig. 12-12a. (male, female). Type: N. China (BMNH).
Ephemera serica - M'Lachlan, 1875:169.
Ephemera serica - Eaton, 1883:73. (male, female).
Ephemera serica - Ulmer, 1926:89, fig. 82-83. (male, female, key).
Ephemera serica - Lestage, 1927:99. (key).
Ephemera serica - Navás, 1930:15.
Ephemera serica - Navás, 1930:138.
Ephemera serica - Wu, 1935:248.
Ephemera serica - Ulmer, 1936:206.
Ephemera serica - Hsu, 1937:438. (male, female, key).
Ephemera serica - Kimmins, 1960:309, fig. 53. (male). [designation of lectotype].
Ephemera serica - Kimmins, 1971:320.
Distribution: Hong Kong, China, Vietnam.

Ephemera (subgenus incertus)

Ephemera sp. T_1
Ephemera T_1 Dudgeon, 1982:225.
Distribution: Hong Kong.

Ephemera sp. T_2
Ephemera T_2 Dudgeon, 1983:441.
Distribution: Hong Kong.

Ephemera sp.
Ephemera sp. Dudgeon, 1984:73.
Ephemera sp. Dudgeon, 1984:210.
Distribution: Hong Kong.

Family **Ephemerellidae** Klapálek, 1909

Subfamily **Ephemerellinae** Klapálek, 1909

Genus **Ephemerella** Walsh, 1863
Ephemerella Walsh, 1863:377.
Type species: **Ephemerella excrucians** Walsh. Subsequent designation by Eaton, 1868:87.

Ephemerella sp. T_1
Ephemerella T_1 Dudgeon, 1982:14.
Ephemerella T_1 Dudgeon, 1982:225.
Ephemerella T_1 Dudgeon, 1983:441.
Ephemerella T_1 Dudgeon, 1984:73.
Ephemerella T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Ephemerella sp. T_2
Ephemerella T_2 Dudgeon, 1982:14.
Ephemerella T_2 Dudgeon, 1982:225.
Ephemerella T_2 Dudgeon, 1984:73.
Ephemerella T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Ephemerella sp. L_3
Ephemerella L_3 Dudgeon, 1984:73.
Ephemerella L_3 Dudgeon, 1984:210.
Distribution: Hong Kong.

Family **Heptageniidae** Needham in Needham & Betten, 1901

Subfamily **Heptageniidae** Needham in Needham & Betten, 1901

Genus **Compsoneuria** Eaton, 1881
Compsoneuria Eaton, 1881:23.
Type species: **Compsoneuria spectabilis** Eaton. Original designation.
Cosmetogenia Eaton, 1883:18, pl. 23.
Type species: **Compsoneuria spectabilis** Eaton. Monotypy.

Compsoneuria sp. T_1
Ecdyonurus T_1 Dudgeon, 1982:14.
Ecdyonurus T_1 Dudgeon, 1982:225.
Ecdyonurus T_1 Dudgeon, 1983:441.
Ecdyonurus T_1 Dudgeon, 1984:73.
Compsoneuria T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Compsoneuria sp. T_2
Ecdyonurus T_2 Dudgeon, 1982:225.
Ecdyonurus T_2 Dudgeon, 1984:73.
Compsoneuria T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Genus **Ecdyonurus** Eaton, 1868
Ecdyonurus Eaton, 1868:142.
Type species: **Ephemera venosa** Fabricius. Original designation.
Ecdyurus Eaton, 1868:90.
Type species: **Ephemera venosa** Fabricius. Objective synonymy. [unjustifed emendation of **Ecdyonurus**].
Paracinygmula Bajkova, 1975:54.
Type species: **Paracinygmula zhilzovae** Bajkova. Original designation.

Ecdyonurus herklotsi Hsu, 1936
Ecdyonurus herklotsi Hsu:233, fig. 2-4. (male). Type: male, Pokfulum [Pokfulam], Hong Kong (Hsu).
Distribution: Hong Kong.

Genus **Epeorus** Eaton, 1881
Epeorus Eaton, 1881:26.
Type species: **Epeorus torrentium** Eaton. Original designation.

Subgenus **Iron** Eaton, 1883
Iron Eaton, 1883: pl. 24.
Type species: **Epeorus longimanus** Eaton. Monotypy.

Epeorus (Iron) sp.
Iron sp. Dudgeon, 1984:73.
Iron sp. Dudgeon, 1984:210.
Distribution: Hong Kong.

Epeorus (subgenus incertus)

Epeorus sp. T_1
Epeorus T_1 Dudgeon, 1982:14
Epeorus T_1 Dudgeon, 1982:225.
Epeorus T_1 Dudgeon, 1983:441.
Epeorus T_1 Dudgeon, 1984:73.
Epeorus T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Epeorus sp. T_2
Epeorus T_2 Dudgeon, 1984:73.
Epeorus T_2 Dudgeon, 1984:210.
Distribution: Hong Kong.

Genus **Heptagenia** Walsh, 1863
Heptagenia Walsh, 1863:197.
Type species: **Palingenia flavescens** Walsh. Subsequent designation by Eaton, 1868, Entomol. Mon. Mag. 5:90.
Kageronia Matsumura, 1931:1479.
Type species: **Kageronia suzukiella** Matsumura. Monotypic.

Heptagenia ngi Hsu, 1936
Heptagenia ngi Hsu, 1936:235, fig. 5-7. (male). Type: male, Shaukiwan, Hong Kong (Hsu).
Distribution: Hong Kong.

Genus **Paegniodes** Eaton, 1881
Paegniodes Eaton, 1881:23.
Type species: **Heptagenia cupulata** Eaton. Original designation.

Paegniodes cupulatus (Eaton, 1871)
Heptagenia cupulata Eaton, 1871:138, pl. 6 fig. 14-14a. (male, female). Type: Northern China (BMNH).
Paegniodes cupulatus - Eaton, 1881:23.
Heptagenia cupulata - Palmén, 1884:74.
Paegniodes cupulatus - Eaton, 1885:261, pl. 23 fig. 4, pl. 24 fig. 4. (male, female).
Paegniodes cupulatus - Ulmer, 1926:107, figs. 98-102. (male, female).
Paegniodes cupulatus - Hsu, 1932:39.
Paegniodes fukienensis - Hsu, 1932:39, fig. 1-3. (male). Type: male, Ling Sioh, Fuken Prov. China (Cornell).
Paegniodes cupulatus - Wu, 1935:252.
Paegniodes fukienensis - Wu, 1935:252.
Paegniodes cupulata - Hsu, 1936:236, fig. 8-13. (male, female).
Paegniodes cupulatus - Ulmer, 1936:211. (male).

Paegniodes cupulatus - Kimmins, 1960:283. [designation of lectotype].
Paegniodes cupulatus - Uéno, 1969:228, fig. 26-36. (male).
Heptagenia cupulata - Kimmins, 1971:312.
Paegniodes cupulatus - Tshernova, 1976:343, fig. 41. (nymph).
Paegniodes fukiensis [sic] - Tshernova, 1976:343.
Distribution: Hong Kong, China, Tibet.

Genus **Thalerosphyrus** Eaton, 1881
Thalerosphyrus Eaton, 1881:22.
Type species: **Baetis determinatus** Walker. Original designation.

Thalerosphyrus sp. T_1
Thalerosphyrus T_1 Dudgeon, 1982:14.
Thalerosphyrus T_1 Dudgeon, 1983:441.
Thalerosphyrus T_1 Dudgeon, 1984:73.
Thalerosphyrus T_1 Dudgeon, 1984:210.
Distribution: Hong Kong.

Family **Leptophlebiidae** Banks, 1900

Subfamily **Atalophlebiinae** Peters, 1980

Genus **Choroterpes** Eaton, 1881
Choroterpes Eaton, 1881:194.
Type species: **Choroterpes lusitanica** Eaton. Original designation.

Subgenus **Euthraulus** Barnard, 1932
Euthraulus Barnard, 1932:249.
Type species: **Euthraulus elegans** Barnard. Monotypy.
Thraululus Ulmer, 1939:499.
Type species: **Thraulus marginatus** Ulmer. Original designation.

Choroterpes (Euthraulus) sp.
Choroterpes (Euthraulus) sp. Dudgeon, 1984:73.
Choroterpes (Euthraulus) sp. Dudgeon, 1984:210.
Distribution: Hong Kong.

Choroterpes (subgenus incertus)

Choroterpes sp. T_1
Choroterpes T_1 Dudgeon, 1982:14.
Choroterpes T_1 Dudgeon, 1983:441.
Distribution: Hong Kong.

Genus **Cryptopenella** Gillies, 1951
Cryptopenella Gillies, 1951:125.
Type species: **Cryptopenella facialis** Gillies. Original designation.

Cryptopenella facialis Gillies, 1951
Cryptopenella facialis Gillies, 1951:127, fig. 11-12, 14. (male, female, nymph).
Type: River Shing Man [Shing Mun River], near Kowloon, Hong Kong (BMNH).
Cryptopenella facialis - Peters & Edmunds, 1970:202, fig. 46-47, 93-94, 122, 145, 336-345. (male, female, nymph).
Cryptopenella facialis - Kimmins, 1971:313.
Distribution: Hong Kong.

Genus **Habrophlebiodes** Ulmer, 1920
Habrophlebiodes Ulmer, 1920:39.
Type species: **Habrophlebia americana** Banks. Original designation.

Habrophlebiodes gilliesi Peters, 1963
Habrophlebiodes gilliesi Peters, 1963:41, fig. 1-11. (male, female). Type: male, Fan Ling near Kowloon, Hong Kong (Utah).
Habrophlebiodes gilliesi - Peters & Edmunds, 1970:187, fig. 19-21, 77, 112, 135, 323. (male, female).
Habrophlebiodes gilliesi - Tsui & Peters, 1970:89, fig. 1-13. (nymph).
Habrophlebiodes gilliesi - Dudgeon, 1982:225.
Distribution: Hong Kong.

Genus **Isca** Gillies, 1951
Isca Gillies, 1951:127.
Type species: **Isca purpurea** Gillies. Original designation.

Subgenus **Isca** Gillies, 1951

Isca (Isca) purpurea Gillies, 1951
Isca purpurea Gillies, 1951:128, fig. 15-22. (male, female). Types: male, female, Hong Kong, 15-20 mi inland from Kowloon (BMNH).
Isca (Isca) purpurea - Peters & Edmunds, 1970:215, fig. 71, 106, 330, 350-357. (male, nymph).
Isca purpurea - Kimmins, 1971:319.
Isca (Isca) purpurea - Hubbard & Peters, 1978:24.
Distribution: Hong Kong, India.

Isca (subgenus incertus)

Isca sp. T_1
Isca T_1 Dudgeon, 1982:225.
Isca T_1 Dudgeon, 1983:441.
Distribution: Hong Kong.

Isca sp.
Isca sp. Dudgeon, 1984:73.
Isca sp. Dudgeon, 1984:210.
Distribution: Hong Kong.

Genus **Thraulus** Eaton, 1881
Thraulus Eaton, 1881:195.
Type species: **Thraulus bellus** Eaton. Original designation.

Masharikella Peters, Gillies & Edmunds, 1964:118.
Type species: **Hagenulus fasciatus** Kimmins. Original designation.

Thraulus sp. T_1

Thraulus T_1 Dudgeon, 1982:225.
Thraulus T_1 Dudgeon, 1983:441.
Distribution: Hong Kong.

LITERATURE CITED

Bajkova, O. Ya. 1975. [New genus of mayfly from Primoriya.] (in Russian). Izvestia Sibirskogo Otdeleniya Akademii Nauk SSSR 1(5):54-57.

Banks, N. 1900. New genera and species of Nearctic neuropteroid insects. Transactions of the American Entomological Society 26:239-259.

Barnard, K. H. 1932. South African Mayflies (Ephemeroptera). Transactions of the Royal Society of South Africa 20:201-259.

Barnard, K. H. 1940. Additional records, and descriptions of new species, of South African alder-flies (Megaloptera), Mayflies (Ephemeroptera), caddis-flies (Trichoptera), stone-flies (Perlaria), and dragon-flies (Odonata). Annals of the South African Museum 32:609-661.

Bengtsson, S. 1912. Neue Ephemeriden aus Schweden. Entomologisk Tidskrift 33:107-117.

Burks, B. D. 1953. The mayflies, or Ephemeroptera, of Illinois. Bulletin of the Illinois Natural History Survey 26:1-216.

Burmeister, H. 1839. Ephemerina. Handbuch der Entomologie 2(2):788-804, 1014.

Campion, H. 1923. On the use of the generic name **Brachycercus** in Plectoptera and Orthoptera. Annals and Magazine of Natural History (9)11:515-518.

Dudgeon, D. 1982a. Aspects of the microdistribution of insect macrobenthos in a forest stream in Hong Kong. Archiv für Hydrobiologie Supplement 64:221-239.

Dudgeon, D. 1982b. An investigation of physical and biological processing of two species of leaf litter in Tai Po Kau Forest Stream, New Territories, Hong Kong. Archiv für Hydrobiologie 96:1-32.

Dudgeon, D. 1983. An investigation of the drift of aquatic insects in Tai Po Kau Forest Stream, New Territories, Hong Kong. Archiv für Hydrobiologie 96:434-447.

Dudgeon, D. 1984a. Seasonal and long-term changes in the hydrobiology of the Lam Tsuen River, New Territories, Hong Kong, with special reference to benthic macroinvertebrate distribution and abundance. Archiv für Hydrobiologie Supplement 69:55-129.

Dudgeon, D. 1984b. Longitudinal and temporal changes in functional organization of macroinvertebrate communities in the Lam Tsuen River, Hong Kong. Hydrobiologia 111:207-217.

Eaton, A. E. 1866. Notes on some species of the orthopterous genus **Cloëon**, Leach (as limited by M. Pictet). Annals and Magazine of Natural History (3)18:145-148.

Eaton, A. E. 1868a. Remarks upon the homologies of the ovipositor. Transactions of the Entomological Society 1868:141-144.

Eaton, A. E. 1868b. An outline of a rearrangement of the genera of Ephemeridae. Entomologist's Monthly Magazine 5:82-91.

Eaton, A. E. 1869. On **Centroptilum**, a new genus of the Ephemeridae. Entomologist's Monthly Magazine 6:131-132.

Eaton, A. E. 1871. A monograph on the Ephemeridae. Transactions of the Entomological Society 1871:1-164, 6 pl.

Eaton, A. E. 1881a. An announcement of new genera of the Ephemeridae. Entomologist's Monthly Magazine 17:191-197.

Eaton, A. E. 1881b. An announcement of new genera of the Ephemeridae. Entomologist's Monthly Magazine 18:21-27.

Eaton, A. E. 1883-1885. A revisional monograph of recent Ephemeridae or mayflies. Transactions of the Linnean Society of London, Second Series, Zoology 3:1-352, 65 pl.

Eaton, A. E. 1892. New species of Ephemeridae from the Tenasserim Valley. Transactions of the Entomological Society of London 1892:185-190.

Gillies, M. T. 1949. Notes on some Ephemeroptera Baëtidae from India and South-East Asia. Transactions of the Royal Entomological Society London 100:161-177.

Gillies, M. T. 1951. Further notes on Ephemeroptera from India and South East Asia. Proceedings of the Royal Entomological Society of London (B)20:121-130.

Hafiz, H. A. 1937. The Indian Ephemeroptera (mayflies) of the sub-order Ephemeroidea. Records of the Indian Museum 39:351-370, pl. 4-5.

Hsu, Y.-C. 1932. Two new species of mayflies from China (Order Ephemerida). Peking Natural History Bulletin 6:39-41, 1 pl.

Hsu, Y.-C. 1936. Mayflies of Hong Kong with descriptions of two new species (Ephemeroptera). Hong Kong Naturalist 7:233-238.

Hsu, Y.-C. 1937-8. The mayflies of China. Peking Natural History Bulletin (1937) 11:129-148, 287-296, 433-440; (1938)

12:53-56, 125-126, 221-224.

Hubbard, M. D. 1982a. Catálogo abreviado de Ephemeroptera da América do Sul. Papéis Avulsos de Zoologia 34:257-282.

Hubbard, M. D. 1982b. Catalog of the Ephemeroptera: family-group taxa. Aquatic Insects 4:49-53.

Hubbard, M. D., and M. L. Pescador. 1978. A catalog of the Ephemeroptera of the Philippines. Pacific Insects 19:91-99.

Hubbard, M. D., and W. L. Peters. 1978. A catalogue of the Ephemeroptera of the Indian Subregion. Oriental Insects Supplement 9:1-43.

Hubbard, M. D., and W. L. Peters. 1984. Ephemeroptera of Sri Lanka: an introduction to their ecology and biogeography. Pages 257-274 in C. H. Fernando (ed.), Ecology and Biogeography in Sri Lanka. Dr. W. Junk Publishers, The Hague.

Hubbard, M. D., and H. M. Savage. 1981. The fossil Leptophlebiidae (Ephemeroptera): a systematic and phylogenetic review. Journal of Paleontology 55:810-813.

Hubbard, M. D., and V. D. Srivastava. 1984. Ephemeroptera type-specimens in the Zoological Survey of India, Calcutta. Oriental Insects 18:1-4.

International Commission on Zoological Nomenclature. 1966. Opinion 787. Bulletin of Zoological Nomenclature 23:209-210.

Jacob, U. 1974. Zur Kenntnis zweier **Oxycypha**-Arten Hermann Burmeisters (Ephemeroptera, Caenidae). Reichenbachia 15:93-97.

Kimmins, D. E. 1947. New species of Indian Ephemeroptera. Proceedings of the Royal Entomological Society of London (B)16:92-100.

Kimmins, D. E. 1960. The Ephemeroptera types of species described by A. E. Eaton, R. McLachlan and F. Walker, with particular reference to those in the British Museum (Natural History). Bulletin of the British Museum (Natural History) Entomology 9:269-318.

Kimmins, D. E. 1971. A list of the type-specimens of Ephemeroptera in the British Museum (Natural History). Bulletin of the British Museum (Natural History) Entomology 25:307-324.

Klapálek, F. 1905. Plecopteren und Ephemeriden aus Java, gesammelt von Prof. K. Kraepelin 1904. Mitteilungen aus dem Naturhistorischen Museum in Hamburg 22:103-107.

Klapálek, F. 1909. Ephemerida, Eintagsfliegen. Süsswasserfauna Deutschlands 8:1-32.

Klyuchareva, O. A. 1963. [On downstream and diurnal vertical migrations of benthic invertebrates in the Amur.] (in Russian). Zoologicheskii Zhurnal 42:1601-1612.

Latreille, P. A. 1810. Considérations générales sur l'ordre naturel des animaux composant les classes des Crustacés, des Arachnides et des Insectes. Chez I. Schoell, Paris. 444pp.

Leach, W. E. 1815. Entomology. Brewster's Edinburgh Encyclopaedia 9:57-172.

Lestage, J. A. 1927. Une **Ephemera** nouvelle du Tonkin et tableau des espèces de la faune orientale. Annales de la Société Entomologique de France 96:93-100.

Linnaeus, C. 1758. Systema Naturae. Ed. X. Holmae. Vol. 1

M'Lachlan, R. 1875. A sketch of our present knowledge of the Neuropterous fauna of Japan (excluding Odonata and Trichoptera). Transactions of the Entomological Society 1875:167-190.

McDunnough, J. 1925. New Canadian Ephemeridae with notes. III. Canadian Entomologist 57:168-176.

Matsumura, S. 1931. [6,000 Illustrated Insects of the Japanese Empire.] (in Japanese). Tokyo.

Müller-Liebenau, I., and M. D. Hubbard. 1986. Baetidae from Sri Lanka with some general remarks on the Baetidae of the Oriental Region (Insecta: Ephemeroptera). Florida Entomologist 68:537-561.

Navás, L. 1922. Efemerópteros nuevos o poco conocidos. Boletin de la Sociedad Entomológica de España 5:54-63.

Navás, L. 1930a. Insectos del Museo de Paris. 5ª Série. Brotéria (Série Zoologica) 24:5-24.

Navás, L. 1930b. Insectos del Museo de Paris. 6ª Série. Brotéria (Série Zoologica) 24:120-144.

Needham, J. G., and C. Betten. 1901. Aquatic insects in the Adirondacks. Bulletin of the New York State Museum 47:384-612, 36 pl.

Newman, E. 1853. Proposed division of Neuroptera into two classes. The Zoologist 11(appendix):181-204.

Palmén, J. A. 1884. Über paarige Ausführungsgänge der Geschlectsorgane bei Insecten. Eine morphologische Untersuchung. Dissertation, Helsingfors. 108pp, 5 pl.

Peters, W. L. 1963. A new species of **Habrophlebiodes** from China (Ephemeroptera: Leptophlebiidae). Proceedings of the Royal Entomological Society of London (B)32:41-43.

Peters, W. L. 1980. Phylogeny of the Leptophlebiidae (Ephemeroptera): an introduction. Pages 33-31 in J. F. Flannagan and K. E. Marshall, eds. Advances in Ephemeroptera Biology. Plenum Press, New York.

Peters, W. L., and G. F. Edmunds, Jr. 1970. Revision of the generic classification of

the Eastern Hemisphere Leptophlebiidae (Ephemeroptera). Pacific Insects 12:157-240.

Peters, W. L., M. T. Gillies, and G. F. Edmunds, Jr. 1964. Two new genera of mayflies from the Ethiopian and Oriental Regions (Ephemeroptera: Leptophlebiidae). Proceedings of the Royal Entomological Society of London (B)33:117-124.

Stephens, J. F. 1835. Illustrations of British Entomology, Mandibulata 6:53-70, pl. 29.

Traver, J. R. 1932. **Neocloeon**, a new mayfly genus (Ephemerida). Journal of the New York Entomological Society 40:365-372, 1 pl.

Tshernova, O. A. 1976. [A key to the larvae of genera of Heptageniidae (Ephemeroptera) from the Holarctic and Oriental Regions.] (in Russian). Entomologicheskoe Obozrenie 55:332-346.

Tsui, P. T. P., and W. L. Peters. 1970. The nymph of **Habrophlebiodes gilliesi** Peters (Ephemeroptera: Leptophlebiidae). Proceedings of the Royal Entomological Society of London 45:89-90.

Uéno, M. 1931. Contributions to the knowledge of Japanese Ephemeroptera. Annotationes Zoologicae Japoneses 13:189-226, pl. 12-13.

Uéno, M. 1969. Mayflies (Ephemeroptera) from various regions of Southeast Asia. Oriental Insects 3:221-238.

Ulmer, G. 1920. Neue Ephemeropteren. Archiv für Naturgeschichte (A)85(11):1-80.

Ulmer, G. 1926. Trichopteren und Ephemeropteren. In: Beiträge zur Fauna sinaica. Archiv für Naturgeschichte (A)91(5):19-110.

Ulmer, G. 1936. Neue chinesische Ephemeropteren, nebst übersicht über die bischer aus China bekannten Arten. Peking Natural History Bulletin 10:201-215.

Ulmer, G. 1939-1940. Eintagfliegen (Ephemeropteren) von den Sunda-Inseln. Archiv für Hydrobiologie Supplement 16:443-692.

Walsh, B. D. 1863. Observations on certain N. A. Neuroptera. Proceedings of the Entomological Society of Philadelphia 2:167-272.

Westwood, J. O. 1836. **Ephemera** (Linnaeus). Partington's British Cyclopaedia of Natural History 2:438-439.

Westwood, J. O. 1840. An introduction to the modern classification of insects. Longman, Orme, Brown, Green, and Longmans, London. 2 vol.

Wu, C. F. 1935. Order VII. Ephemeroptera. Catalogus Insectorum Sinensium 1:247-253.