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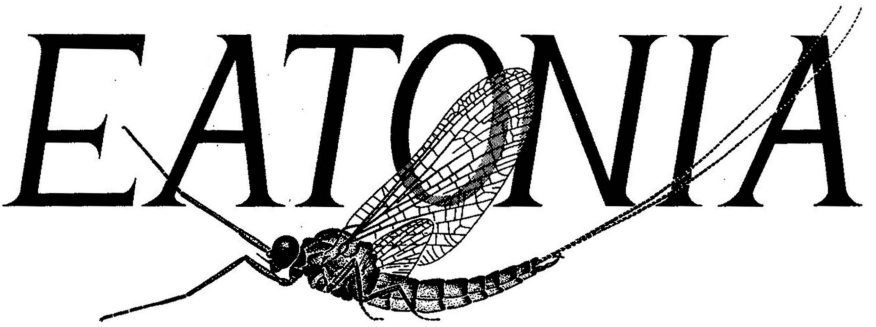
Eatonia No. 16, Mar. 15, 1973

William L. Peters

Janice Peters



No. 16 Florida A & M University, Tallahassee March 15, 1973

This issue of Eatonia is rather small and devoted almost entirely to recent literature. We very much appreciate receiving reprints on Ephemeroptera and sincerely thank all who have sent them. However, we would like once again to request articles of general interest for News and Notes. The editors need your help, your suggestions, and your contributions.

Individuals who wish to request Eatonia should write the editor, University P. O. Box 111, Florida A & M University. University and institutional library requests should be addressed to Dr. N. E. Gaymon, Director of Libraries, University P. O. Box 78, Florida A & M University, Tallahassee, Florida 32307.

News and Notes

The 14th International Congress of Entomology was held in Canberra, Australia, August 22-30. Those Ephemeropterists attending were: Dr. and Mrs. G. F. Edmunds, Dr. V. Landa, and Dr. and Mrs. W. L. Peters. Dr. and Mrs. E. F. Riek of Canberra welcomed all aquatic entomologists, arranged laboratory visits and other tours, and hosted a superb dinner. We thank the Rieks, as well as all members of the Congress committees, for making the Canberra Congress so enjoyable. The following papers on Ephemeroptera were presented: The origin of the mayfly family Caenidae, by G. F. Edmunds, and The adult habits of Dolania americana, by W. L. Peters.

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The Type Localities of the Ephemeroptera of North America North of Mexico by G. F. Edmunds (1962) is not available as a reprint but it can be purchased for $1.75 from the University of Utah Press, Salt Lake City, Utah 84112, USA. This paper contains the most recent list of species of North American Ephemeroptera.

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In Eatonia # 15, we inadvertently cited J. M. Elliott as the sole author of "The effects of electrofishing on the invertebrates of a Lake District stream" (1972) [18]. We sincerely apologize to T. B. Bagenal, co-author of this paper, for omitting his name.

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In Eatonia #13-14 and #15, we published references and abstracts from two publications written entirely in Japanese. We used some translations and transliterations different from those in use at Nara Women's University, Japan. With the kind help of Dr. M. Tsuda, Nara, we make the following corrections in author's names and translations of journal titles.

1. For the journal "Nara Rikusui Seibutsu Gakuhô" translate title as "Nara Hydrobiology" (NOT "Nara Freshwater Biological Reports")

2. Use corrected spellings for authors as follow: G. Okawara (for G. Ôgawara or S. Ôhgawara); T. Shiota (for T. Shioda); T. Tetsukawa (for A. Tetsukawa); and I. Tarutani (for I. Taruya).

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Corrections to Eatonia Index (Eatonia #15):

p. 11. Delete "female imago" to read: Baetis nigrescens Navas (nymph; redescription of male imago) Müller-Liebenau (1971) [56] p. 16.

Change female "subimago" to "imago" to read: Baetodes arizonensis sp. n. (male subimago, female imago, nymph; Arizona, USA) Koss (1972) [39] p. 96.

Change female "subimago" to "imago" to read: Baetodes edmundsi sp. n. (male & female imagos, nymph; Arizona to Texas, USA) Koss (1972) [39] p. 98.

p. 12. Change "p. 545" to "p. 547" to read: Afronurus curtus sp. n. (female imago; Northwest Himalaya, India) Dubey (1972) [16] p. 547.

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Recent Ephemeroptera Literature

Compiled by William L. Peters and George F. Edmunds, Jr.

Alekseev, V. A.

[1] -1971 (?). Sravnitel'naya ustoichivost' vodnykh nasekomykh i paukoobraznykh k fenolu. [Comparative resistance of aquatic insects and arachnids to phenol.] Biol. Vnutr. Vod, Inf. Bull., 11:49-52.

EATONIA

A NEWSLETTER FOR EPHEMEROPTERISTS

Prepared by the S. H. Coleman Library, Florida A & M University

in cooperation with

School of Agriculture and Home Economics, Florida A & M University

Department of Biology, University of Utah

Janice G. Peters - Editor
William L. Peters and George F. Edmunds, Jr. - Editorial Committee

This public document was promulgated at an annual cost of $620.00 or $0.33 per copy for the purposes of (1) acquainting all workers with the current research of others, (2) promoting increased knowledge of the literature, especially among workers recently entering the field, and (3) promoting more precise methods and techniques of studying Ephemeroptera. It appears twice each year.

Alekseev (continued)

[2] -1971. Issledovanie ostroi fenol'noi intoksikatsii nekotorykh vidov nasekomykh i paukoobraznykh (Soobshchenie II). [Study of acute phenol intoxication of some species of insects and arachnids (Report II).] Gidrobiol. Zh., 7(3):44-48, 2 figs., 1 table.

Allen, R. K. & E. S. Chao

[3] -1972. A new species of Baetodes from Arizona (Ephemeroptera: Baetidae). Bull. South. Calif. Acad. Sci., 71:52, 2 figs.

Arvy, L.

[4] -1971. Spirinella adipophila, Arvy et Delage 1966, parasite d'Ephemera vulgata, une énigme. C. R. 1er. Multicolloq. Eur. Parasitol., 1971, p. 431.

Bohle, H. V.

[5] -1972. Die Temperaturabhängigkeit der Embryogenese und der embryonalen Diapause von Ephemerella ignita (Poda) (Insecta, Ephemeroptera). Oecologia (Berl.), 10:253-268, 8 figs.

Burton, G. J. & T. M. McRae

[6] -1972. Phoretic attachment of Simulium larvae and pupae to mayfly and dragonfly nymphs. Mosquito News, 32:436-443, 1 fig., 1 table.

Carlson, D.

[7] -1972. Comparative value of black light and cool white lamps in attracting insects to aquatic traps. J. Kans. Entomol. Soc., 45:194-199, 7 figs., 2 tables.

Clifford, H. F.

[8] -1972. Comparison of samples of stream bottom fauna collected during the day and at night. Limnol. Oceanogr., 17:475-478, 2 tables.

[9] -1972. A year's study of the drifting organisms in a brown-water stream of Alberta, Canada. Can. J. Zool., 50:975-983, 4 figs., 5 tables.

[10] -1972. Drift of invertebrates in an intermittent stream draining marshy terrain of west-central Alberta. Can. J. Zool., 50:985-991, 4 figs., 4 tables.

Cohen, S. D. & R. K. Allen

[11] -1972. New species of Baetodes from Mexico and Central America (Ephemeroptera: Baetidae). Pan-Pac. Entomol., 48:123-135, 23 figs.

Dickson, K. L. & J. Cairns, Jr.

[12] -1972. The relationship of fresh-water macroinvertebrate communities collected by floating artificial substrates to the MacArthur-Wilson equilibrium model. Am. Midl. Nat., 88:68-75, 3 figs., 5 tables.

Dubey, O. P.

[13] -1971(1970). Description of a new ephemerid from India. Agra Univ. J. Res. Sci., 19(3):67-68, figs.

Edmunds, G. F., Jr. & R. W. Koss

[14] -1972. A review of the Acanthametropodinae with a description of a new genus (Ephemeroptera: Siphlonuridae). Pan-Pac. Entomol., 48:136-144, 7 figs.

Elliott, J. M. & J. Corlett

[15] -1972. The ecology of Morecambe Bay IV. Invertebrate drift into and from the River Leven. J. Appl. Ecol., 9:195-205, 1 fig., 8 tables.

Fahy, E.

[16] -1972. An automatic separator for the removal of aquatic insects from detritus. J. Appl. Ecol., 9:655-658, 3 figs., 1 table, 1 plate.

Fisher, S. G. & A. LaVoy

[17] -1972. Differences in littoral fauna due to fluctuating water levels below a hydroelectric dam. J. Fish. Res. Board Can., 29:1472-1476, 1 fig., 2 tables.

Gibson, H. R. & D. W. Chapman

[18] -1972. Effects of Zectran insecticide on aquatic organisms in Bear Valley Creek, Idaho. Trans. Am. Fish. Soc., 101:330-344, 11 figs., 8 tables.

Glime, J. M. & R. M. Clemons

[19] -1972. Species diversity of stream insects on Fontinalis spp. compared to diversity on artificial substrates. Ecology, 53:458-464, 2 figs., 1 table.

Gose, K.

[20] -1971. [Life cycles of mayflies and stoneflies in Minagase on the Takami River.] (in Japanese) Yoshinogawa no Seibuzu-Seisanryoku no Kenkyu [Invest. Prod. Yoshino River], 3:8-13, 25 figs.

Hamilton, K. G. A.

[21] -1972. The insect wing, Part IV. Venational trends and the phylogeny of the winged orders. J. Kans. Entomol. Soc., 45:295-308, 35 figs.

Hinckley, T. M. & H. D. Kennedy

[22] -1972. Fluctuations of aquatic and terrestrial invertebrates in drift samples from Convict Creek, California. Northwest Sci., 46:270-276, 2 figs., 3 tables.

Inagaki, S.

[23] -1970. Éthologie et morphologie d'une éphémère Cloeon sp. et experiences sur sa survie imaginale. Cah. Nat., Bull. B. P., 26:45-52, 2 figs.

Kroger, R. L.

[24] -1972. Underestimation of standing crop by the Surber sampler. Limnol. Oceanogr., 17:475-478, 2 tables.

Langford, T. E. & R. J. Aston

[25] -1972. The ecology of some British rivers in relation to warm water discharges from power stations. Proc. R. Soc. Lond. (B), 180:407-419, 16 figs., 1 table.

Lehmkuhl, D. M.

[26] -1972. Change in thermal regime as a cause of reduction of benthic fauna downstream of a reservoir. J. Fish. Res. Board Can., 29:1329-1332, 2 figs.

[27] -1972. Baetisca (Ephemeroptera: Baetiscidae) from the western interior of Canada with notes on the life cycle. Can. J. Zool., 50:1015-1017, 5 figs.

Lehmkuhl, D. M. & N. H. Anderson

[28] -1972. Microdistribution and density as factors affecting the downstream drift of mayflies. Ecology, 53:661-667, 7 figs., 2 tables.

Levanidova, I. M.

[29] -1972. Podenki Kamchatskogo poluostrova (ekologo-faunisticheskii obzor). [The mayflies of Kamchatka (an ecological-faunistic review).] Izv. Tikhookean. Nauchno-Issled. Inst. Rybn. Khoz. Okeanogr., 82:93-115, 6 tables.

Lewis, D. J. & R. H. L. Disney

[30] -1972. Five Simuliidae (Diptera) from West Cameroon. J. Entomol. (B), 41:59-67, 28 figs.

Macek, K. J., D. F. Walsh, J. W. Hogan & D. D. Holz

[31] -1972. Toxicity of the insecticide Dursban® to fish and aquatic invertebrates in ponds. Trans. Am. Fish. Soc., 101:420-427, 2 figs., 3 tables.

Mackenthun, K. M. & L. E. Keup

[32] -1972. "Water pollution. Freshwater macroinvertebrates," in Literature Review. J. Water Pollut. Control Fed., 44:1137-1150.

McKinley, R. E., R. Prins & L. E. Jech

[33] -1972. Occurrence and distribution of arthropods in Travertine Creek, Platt National Park, Murray County, Oklahoma. Proc. Okla. Acad. Sci., 52:49-52, 2 figs., 1 table.

Nebeker, A. V.

[34] -1972. Effect of low oxygen concentration on survival and emergence of aquatic insects. Trans. Am. Fish. Soc., 101:675-679, 3 figs., 3 tables.

Pearson, W. D. & R. H. Kramer

[35] -1972. Drift and production of two aquatic insects in a mountain stream. Ecol. Monogr., 24:365-385, 14 figs., 14 tables.

Peterka, J. J.

[36] -1972. Benthic invertebrates in Lake Ashtabula Reservoir, North Dakota. Am. Midl. Nat., 88:408-418, 3 figs., 1 table.

Peters, W. L. & G. F. Edmunds, Jr.

[37] -1972. A revision of the generic classification of certain Leptophlebiidae from southern South America. Ann. Entomol. Soc. Am., 65:1398-1414, 93 figs.

Peters, W. L. & P. T. P. Tsui

[38] -1972. New species of Thraulus from Asia (Leptophlebiidae: Ephemeroptera). Orient. Insects, 6:1-17, 61 figs.

Puthz, V.

[39] -1972. Ueber Dicercomyzon sjostedti (Ulmer) (Insecta, Ephemeroptera). Rev. Zool. Bot. Afr., 85:183-186.

[40] -1972. Eine neue Rhithrogena aus Südosteuropa (Insecta, Ephemeroptera). Ent. Mitt. Zool. Mus. Hamb., 4(79):303-307, 5 figs.

Reisen, W. K. & R. Prins

[41] -1972. Some ecological relationships of the invertebrate drift in Praters Creek, Pickens County, South Carolina. Ecology, 53:876-884, 3 figs., 3 tables.

Ressl, F.

[42] -1970. Über Massenauftreten und Erscheinungslücken einiger Insektenarten im Bezirk Scheibbs (N.Ö.). Entomol. Nachrichtenbl., 22:29-31.

Särkkä, J.

[43] -1972. The bottom macrofauna of the oligotrophic Lake Konnevesi, Finland. Ann. Zool. Fenn., 9:141-146, 3 figs., 3 tables.

Simmons, G. M., Jr.

[44] -1972. A pre-impoundment study of the North Anna River, Virginia. VPI-WRRC-Bull. (Va. Polytech. Inst. — Water Resourc. Res. Cent.), 55:1-76, 20 figs., 7 tables, 11 appendices.

[45] -1972. A preliminary report on the use of the sequential comparison index to evaluate acid mine drainage on the macrobenthos in a pre-impoundment basin. Trans. Am. Fish. Soc., 101:701-713, 10 figs., 5 tables.

Simmons, G. M., Jr. & A. Winfield

[46] -1971. A feasibility study using conservation webbing as an artificial substrate in macrobenthic studies. Va. J. Sci., 22:52-59, 8 figs., 1 table.

Tetsukawa, T., T. Kawai & K. Ikeuchi

[47] -1971. Takamigawa no kawagishi ni mirareru suiseikonchu. [Aquatic insects in the banks of the Takami River.] (in Japanese) Yoshinogawa no Seibuzu-Seisanryoku no Kenkyu [Invest. Prod. Yoshino River], 3:19, 2 tables.

Thibault, M.

[48] -1971. Écologie d'un ruisseau à truites des Pyrénées-Atlantiques, le Lissuraga I. — Étude critique du milieu. Ann. Hydrobiol., 2:209-239, 7 figs., 5 tables.

[49] -1971. Écologie d'un ruisseau à truites des Pyrénées-Atlantiques, le Lissuraga II. — Les fluctuations thermiques de l'eau; répercussion sur les périodes de sortie et la taille de quelques Éphéméroptères, Plécoptères et Trichoptères. Ann. Hydrobiol., 2:241-274, 7 figs., 5 tables.

Tjønneland, A.

[50] -1972. Observations on Centroptilum notabile Kimmins (Ephemeroptera) at Jinja Uganda. Årbok Univ. Bergen, Mat.-Naturvit. Ser., 1971(1):3-9, 3 figs., 1 table.

Tshernova, O. A. (or Chernova)

[51] -1971. Podenka iz iskopaemoi smoly melovykh otlozhenii polyarnoi Sibiri (Ephemeroptera, Leptophlebiidae). [A mayfly (Ephemeroptera, Leptophlebiidae) from fossil resin of Cretaceous deposits in the polar regions of Siberia.] Entomol. Obozr., 50:612-618, 5 figs.

Tsuda, M.

[52] -1972. Interim results of the Yoshino River productivity survey, especially on benthic animals. Proc. IBP-UNESCO Symp. Prod. Probl. Freshwaters, 1970, p. 827-841, 19 figs.

Tsuda, M., T. Watanabe & K. Tani

[53] -1970. Pollution — a biological study of some receiving waters in Hokkaido. Int. Symp. Water Pollut. Cold Clim., 1970, p. 113-124, 1 fig., 4 tables.

Tsui, P. T. P. & W. L. Peters

[54] -1972. The comparative morphology of the thorax of selected genera of the Leptophlebiidae (Ephemeroptera). J. Zool., Lond., 168:309-367, 55 figs.

Ulanoski, J. T. & W. F. McDiffett

[55] -1972. Diurnal variations in respiration of mayfly nymphs (Ephemeroptera). Physiol. Zool., 45:97-105, 3 figs.

Wichard, W., H. Komnick & J. H. Abel, Jr.

[56] -1972. Typology of ephemerid chloride cells. Z. Zellforsch., 132:533-551, 9 figs., 1 table.

Woodall, R. W., Jr. & J. B. Wallace

[57] -1972. The benthic fauna in four small southern Appalachian streams. Am. Midl. Nat., 88:393-407, 6 tables.

Eatonia Index

compiled by Janice G. Peters

The numbers in brackets refer to paper numbers listed in the Recent Ephemeroptera Literature. In this and subsequent issues we list subject matter only once, with the obvious exception of taxonomy and associated geographical distribution. When a paper treats two or more topics, or when it easily could be treated in different ways, we give one abstract with short cross references at the end of other significant sections.

TAXONOMY

BAETIDAE

Baetodes adustus sp. n. (male & female nymphs; Mexico) Cohen & Allen (1972) [11] p. 123.

Baetodes caritus sp. n. (male & female nymphs; Guatemala - also El Salvador, Mexico, Honduras) Cohen & Allen (1972) [11] p. 124.

Baetodes deficiens sp. n. (male & female nymphs; Honduras - also Mexico) Cohen & Allen (1972) [11] p. 126.

Baetodes fuscipes sp. n. (male & female nymphs; Mexico - also Honduras) Cohen & Allen (1972) [11] p. 128.

Baetodes inermis sp. n. (male & female nymphs; Mexico) Cohen & Allen (1972) [11] p. 129.

Baetodes noventus sp. n. (male & female nymphs; El Salvador - also Guatemala, Honduras) Cohen & Allen (1972) [11] p. 130.

Baetodes pallidus sp. n. (male & female nymphs; Honduras - also Mexico) Cohen & Allen (1972) [11] p. 132.

Baetodes pictus sp. n. (female nymph; Mexico) Cohen & Allen (1972) [11] p. 133.

Baetodes sigillatus sp. n. (male & female nymphs; Arizona, USA) Allen & Chao (1972) [3] p. 52.

Baetodes tritus sp. n. (male & female nymphs; Mexico - also Guatemala, Honduras) Cohen & Allen (1972) [11] p. 133.

EUTHYPLOCIIDAE

Euthyplocia punensis sp. n. (Poona, India) Dubey (1971) [13] p. 67.

HEPTAGENIIDAE

Rhithrogena germanica of authors NEC Eaton, 1885
SEE Rhithrogena sowai

Rhithrogena sowai sp. n. (= Rhithrogena germanica of Klápalek, 1906,1909, Ulmer, 1927, 1929, Schoenemund, 1930, Mikulski, 1931,1936, Boisset, 1939, Bogoescu, 1958, Ujhelyi, 1959 NEC Eaton, 1885; male imago redescribed) Puthz (1972) [40] p. 304.

LEPTOPHLEBIIDAE

Genus Atalonella Needham & Murphy (redescription) Peters & Edmunds (1972) [37] p. 1411.

Atalonella ophis Needham & Murphy (designated type species of genus) Peters & Edmunds (1972) [37] p. 1411.

Atalophlebia anastomosis Demoulin
SEE Hapsiphlebia anastomosis

Atalophlebia chilensis Eaton
SEE Penaphlebia chilensis

Atalophlebia fulvipes Needham & Murphy
SEE Penaphlebia fulvipes

Atalophlebia sepia Thew
SEE Penaphlebia sepia

Atalophlebia vinosa Demoulin
SEE Penaphlebia vinosa

Deleatidium biobionicum Ulmer
SEE Meridialaris biobionica

Deleatidium chiloeense Demoulin
SEE Meridialaris chiloeense

Deleatidium diguillinum Demoulin
SEE Meridialaris diguillina

Deleatidium illapeli Demoulin
SEE Meridialaris illapeli

Deleatidium laminatum Ulmer
SEE Meridialaris laminata

Deleatidium patagonicum (Lestage)
SEE Meridialaris patagonica

Deleatidium penai Demoulin
SEE Meridialaris penai

Genus Hapsiphlebia gen. n. Peters & Edmunds (1972) [37] p. 1401.

Hapsiphlebia anastomosis (Demoulin) (transferred from genus Atalophlebia) Peters & Edmunds (1972) [37] p. 1401.

Genus Massartella Lestage (redescription) Peters & Edmunds (1972) [37] p. 1404.

Genus Massartellopsis Demoulin (redescription; nymph) Peters & Edmunds (1972) [37] p. 1409.

Genus Meridialaris gen. n. Peters & Edmunds (1972) [37] p. 1405.

Meridialaris biobionica (Ulmer) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris chiloeense (Demoulin) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris diguillina (Demoulin) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris illapeli (Demoulin) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris laminata (Ulmer) (transferred from genus Deleatidium; type species of genus) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris patagonica (Lestage) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Meridialaris penai (Demoulin) (transferred from genus Deleatidium) Peters & Edmunds (1972) [37] p. 1405.

Genus Penaphlebia gen. n. Peters & Edmunds (1972) [37] p. 1399.

Penaphlebia chilensis (Eaton) (transferred from genus Atalophlebia; type species of genus) Peters & Edmunds (1972) [37] p. 1399.

Penaphlebia fulvipes (Needham & Murphy) (transferred from genus Atalophlebia) Peters & Edmunds (1972) [37] p. 1399.

Penaphlebia sepia (Thew) (transferred from genus Atalophlebia) Peters & Edmunds (1972) [37] p. 1399.

Penaphlebia vinosa (Demoulin) (transferred from genus Atalophlebia) Peters & Edmunds (1972) [37] p. 1399.

Thraulus bishopi sp. n. (male & female imagos, nymph; West Malaysia) Peters & Tsui (1972) [38] p. 8.

Thraulus hsui sp. n. (male imago, nymph; New Guinea) Peters & Tsui (1972) [38] p. 5.

Thraulus maculatus sp. n. (male imago, nymph; Thailand) Peters & Tsui (1972) [38] p. 7.

Thraulus mariae sp. n. (male & female imagos, nymph; New Guinea) Peters & Tsui (1972) [38] p. 3.

SIPHLONURIDAE, Acanthametropodinae

Genus Analetris gen. n. Edmunds IN Edmunds & Koss (1972) [14] p. 138.

Analetris eximia sp. n. (male subimago, nymph; Wyoming - also Utah, USA, Saskatchewan, Canada; = genus et species incertus of Edmunds, 1954; = genus et species novum of Edmunds & Musser, 1960; = undescribed genus of Edmunds, 1957, Edmunds, Allen & Peters, 1963, Lehmkuhl, 1970) Edmunds IN Edmunds & Koss (1972) [14] p. 138.

Genus Siphluriscus Ulmer (transferred from subfamily Siphlonurinae) Edmunds & Koss (1972) [14] p. 136.

SIPHLONURIDAE, Siphlonurinae

Genus Siphluriscus Ulmer
SEE Subfamily Acanthametropodinae

TRICORYTHIDAE

Dicercomyzon marginatum Kimmins
SEE Dicercomyzon sjostedti

Dicercomyzon sjostedti (Ulmer) (= Dicercomyzon marginatum Kimmins syn. n.) Puthz (1972) [39] p. 185.

FOSSIL EPHEMEROPTERA

AMETROPODIDAE

Subfamily Mesonetinae Tshernova
SEE Family Leptophlebiidae

LEPTOPHLEBIIDAE

Subfamily Mesonetinae Tshernova (transferred from family Ametropodidae) Tshernova (1971) [51] p. 612.

Genus Cretoneta gen. n. Tshernova (1971) [51] p. 614.

Cretoneta zherichini sp. n. Tshernova (1971) [51] p. 614.

SIPHLONURIDAE, Acanthametropodinae

Genus Stackelbergisca Tshernova (transferred from subfamily Siphlonurinae) Edmunds & Koss (1972) [14] p. 136.

SIPHLONURIDAE, Siphlonurinae

Genus Stackelbergisca Tshernova
SEE Subfamily Acanthametropodinae

OTHER TAXONOMY

Keys to and phylogeny of southern South American genera of Leptophlebiidae. Discussion of the status of Nousia delicata Navas. The species delicata is not identifiable, but Nousia is probably a senior synonym of Atalonella. Peters & Edmunds (1972) [37].

The Rhithrogena germanica Eaton problem with new verifications of specimens correctly identified in the literature. Puthz (1972) [40].

Taxonomic notes on Cloeon sp. 1 (near languidum Grandi) from Gif-sur-Yvette, France. Inagaki (1970) [23].

Keys to nymphs and adults of Thraulus, with notes on variation in gill types. Peters & Tsui (1972) [38].

Comments on Epeoromimus beybienkoi Tshernova with reasons why it cannot be a Baetidae. Tshernova (1971) [51].
(FOSSIL EPHEMEROPTERA)

BIOLOGY - life histories

Effects of temperature on embryonic development of Ephemerella ignita. Diapause is obligatory with few exceptions, occurs at stage 10 (nearly mature), and is terminated only at comparatively low temperatures. Postdiapause development is influenced by temperature and is fastest between 19.2° and 24.1° C. Discussion of the role of diapause in the developmental cycle. Bohle (1972) [5].

Life cycle and biology of Baetisca bajkovi. Lehmkuhl (1972) [27].

Life cycles of mayflies of the Kamchatka Peninsula, USSR. Ephemerella tricantha and Iron maculatus show rapid summer growth, with little growth during the rest of the year. Nymphs of Chitonophora aurivillii, C. mucronata, Cinygmula malaisei, Baetis tenax, and Ameletus camtschaticus develop all year. Other species are also discussed. Levanidova (1972) [29].

Life cycles of stoneflies and 18 species of mayflies in the Takami River, Japan. Data indicate 2 generations per year for Paraleptophlebia chocorata, Choroterpes trifurcata, Ephemerella rufa, E. longicaudata, Baetis yamatoensis, Baetiella japonica, and Epeorus latifolium. Univoltine species are Paraleptophlebia spinosa, Ephemerella trispina, E. basalis, E. yoshinoensis, E. nigra, Ameletus montanus, A. costalis, Epeorus ikanonis, E. uenoi, Ecdyonurus yoshidae, and Rhithrogena japonica. Gose (1971) [20].

ALSO SEE: Pearson & Kramer [35] life cycle and growth rates of Baetis bicaudatus.

BIOLOGY - adult activity

Comparison of adult emergence periods for 7 aquatic insects from 2 similar streams with many years of accurate temperature records. Six species emerge 1-3 months earlier while 1 autumn species emerges later in the warmer French stream than in the colder English stream. Ephemerella ignita and Baetis muticus emerge 3 and 2 months earlier and extend the emergence period 2 and 4 months longer respectively. Discussion of role of temperature in development and emergence. Thibault (1971) [49].

Effect of humidity on duration of Cloeon sp. 1 (near languidum Grandi). Two female imagos lived more than 3 weeks at 100% humidity. Experiments on male imagos resulted in curves of increased longevity with increased humidity, males surviving up to 4 days at 52% and 58%, 5 days at 67%, 7 days at 76%, and up to 9-10 days at humidities of 82% and above. Males fly in full sunlight and at twilight. Discussion of evolution of Cloeon from aquatic environment. Inagaki (1970) [23].

Report of mass occurrence of Caenis sp. and other insects in Austria. Ressl (1970) [42].

Analysis of nightly light-trap catches of Centroptilum notabile in Uganda. Catches are influenced by wind. Factors biasing the sex ratio in favor of females are discussed. Tjønneland (1972) [50].

BIOLOGY - nymphal activity

Drift, and the relation of current speed to substrate selection, for 5 Oregon, USA, Ephemeroptera — Baetis tricaudatus, B. parvus, Paraleptophlebia debilis, P. temporalis, Cinygmula reticulata. Discussion of benthos and drift relationships, with emphasis on species differences and the role of drift in population dispersal. Lehmkuhl & Anderson (1972) [28].

Drift and production of Baetis bicaudatus and Oligophlebodes sigma in a Utah stream, USA. Fifty-five percent of the drift of B. bicaudatus is accounted for by 17 independent variables. Most significant in day drift were discharge, density of B. bicaudatus, density of other selected invertebrate species, solar radiation, and distance below source; in night drift major factors were discharge, length of period, density of Rhyacophila, mean temperature, and growth of O. sigma. Pearson & Kramer (1972) [35].

Effects of water velocity on drift in a California stream, USA. An 18% increase in velocity increased drift of terrestrial insects only. A 78% increase caused an immediate but temporary increase in drifting aquatic organisms. Most insects were night active. Hinckley & Kennedy (1972) [22].

Diel and seasonal fluctuations in drift of invertebrates in a South Carolina stream, USA. Among Ephemeroptera, drift of Ephemerella sp. was density dependent while drift of Baetis sp. was probably related to pre-emergence activity. In this stream, community biomass cannot be estimated from drift. Reisen & Prins (1972) [41].

Daily change in upstream migration of benthic animals in the Yoshino River, Japan. Gose IN Tsuda (1972) [52].

ALSO SEE: Ulanoski & McDiffett [55] light influence on diurnal activity as measured by hourly oxygen consumption; Clifford [9] drift of species in the Bigoray River, Alberta, Canada; Clifford [10] drift in an intermittent tributary of the Bigoray River, Canada, with notes on Leptophlebia cupida; Elliott & Corlett [15] drift data for invertebrate species in the River Leven, England-UK.

ECOLOGY

Comparison of aquatic insect communities on brook moss (Fontinalis spp.) with those populating similar string and plastic artificial substrates. Communities were similar on all substrates, although string was preferred to plastic and numbers were greater on moss, indicating moss serves primarily as a substrate. Ephemeroptera on moss were Ephemerella deficiens, E. funeralis, Leptophlebia sp., and Baetis sp. Glime & Clemons (1972) [19].

Faunal communities of a freshwater "intertidal" zone created by seasonal and daily fluctuations of water level below a hydro-electric dam on the Connecticut River, USA. Total individuals, biomass, taxa, and diversity were much higher in areas constantly under water, but a community (primarily chironomid-oligochaete) including Tricorythodes sp. existed in areas out-of-water up to 70% of the time; most insects were probably washed onto shallow areas during high water. Fisher & LaVoy (1972) [17].

Comparison of 4 Appalachian, USA, mountain streams in 4 different vegetational communities. Invertebrate genera were the same, but their relative proportion in the benthic community changed in each stream. Biomass was lowest in white pine, higher in hardwood, old field, and highest in coppice stream. Vegetation is probably the main factor affecting species composition in these streams. Woodall & Wallace (1972) [57].

Aquatic insects living in the reed, Phragmites japonica, in the Takami River, Japan. The habitat was preferred by young nymphs in the 1-5 mm size class, particularly Caenis sp. CB. Tetsukawa, Kawai & Ikeuchi (1971) [47].

ALSO SEE: Dickson & Cairns [12] community structure on artificial substrates.

EVOLUTION AND PHYLOGENY

Phylogeny and evolution of recent and fossil insect orders based on basal portion of wings and venational types. Hamilton (1972) [21].

FAUNAL STUDIES - geographical

New distribution records in Canada for Baetisca obesa and B. bajkovi. Lehmkuhl (1972) [27].

Mayfly species of the Kamchatka Peninsula, USSR, their distribution and relationships. Levanidova (1972) [29].

FAUNAL STUDIES - limnological

Arthropods, including Ephemeroptera species, of Travertine Creek, Platt National Park, Oklahoma, USA. McKinley, Prins & Jech (1972) [33].

Macrofauna of Lake Konnevesi, Finland. Ephemera vulgata is common in the sublittoral zone. Caenis spp. are also present. Särkkä (1972) [43].

ALSO SEE: Simmons [45] invertebrate species of North Anna River, Virginia, USA; Simmons & Winfield [46] invertebrate species of a small tributary of the North Anna River, USA.

HYDROBIOLOGY

Seasonal patterns and biomass of drift in a brown-water stream, Alberta, Canada. Most species were distributed evenly in the water column, and were night-active. The Bigoray River is characterized by low winter drift and a large number of drifting entomostracans (small crustaceans). Net size problems are discussed. Clifford (1972) [9].

Seasonal patterns and biomass of drift in an intermittent, marsh-fed tributary of the Bigoray River, Alberta, Canada. Entomostracans, rotifers, and insect taxa predominated. Abundant taxa were day-active. The tributary contributes planktonic animals to the river fauna; marsh drainage could damage the ecology of the river. Clifford (1972) [10].

Survey of Ephemeroptera and other insects downstream from a dam on the Saskatchewan River, Canada, shows a near absence of mayfly fauna below the dam with slow recovery downstream. Most physical factors were unchanged above and below the dam, except temperature. Known temperature requirements of Ephoron album and Ephemera simulans are compared with water temperatures above and below the dam, showing below-dam temperatures too low for a complete life cycle. Comments are included on other species where

temperature signals coordinating life cycles are affected. Lehmkuhl (1972) [26].

Standing crop and seasonal changes in biomass of benthic invertebrates in Lake Ashtabula, North Dakota, USA. Standing crop of Caenis and Hexagenia decreased in late summer. Peterka (1972) [36].

Use of the sequential comparison diversity index proved unsatisfactory in evaluating recovery from acid-mine drainage in a Virginia stream, USA. At the point below acid-mine drainage where the index indicated complete recovery, the benthic community structure was changed and standing crop reduced 50% compared with data from above the pollution source. Mollusca were absent and Ephemeroptera taxa reduced by 62.5% at the area of supposed recovery. Simmons (1972) [45].

Pre-impoundment study of the North Anna River, Virginia, USA, with geological, physical, and chemical data and information on benthic community structure. Simmons (1972) [44].

Invertebrate drift in the River Leven, England-UK, to determine potential colonizers of a proposed lake. Elliott & Corlett (1972) [15].

Preliminary results of studies on temperature changes and their effects in British streams resulting from power plant cooling water discharges. Water temperatures rose (up to an average of 6° C in streams studied) and daily temperature fluctuations destabilized. Species diversity seemed unaffected; nymphs of species studied, including Heptagenia sulphurea and Ephemerella ignita, can tolerate temperatures up to 28° C. Langford & Aston (1972) [25].

Geological, physical, and chemical description of the Lissuraga, a Pyrenees trout stream, France (preliminary report in ecological series). Thibault (1971) [48].

Comparison of number and weight of invertebrates collected by Surber sampler and by hand collections in the Snake River, USA, immediately after a dam closed stopping water flow. Data indicate that the sampler underestimates standing crop and misrepresents relative abundance of invertebrate groups. Kroger (1972) [24].

Bottom samples taken over a year in the afternoon and at night give very similar pictures of the composition of bottom fauna in the Bigoray River, Alberta, Canada. Clifford (1972) [8].

Colonization of artificial plastic substrate samplers (3M #200 conservation web) did not reach the point of stability predicted by the Mac-Arthur-Wilson equilibrium model. Thus the plastic web should not be used for quantitative data. However, it did collect insects, including Ephemeroptera, which are good indicators of water quality. Dickson & Cairns (1972) [12].

Comparison of fauna colonizing an artificial substrate (plastic conservation webbing) with that collected by Surber sampler in a small stream, Virginia, USA. Diptera and Plecoptera colonized the substrate extensively. Many other groups were rare or absent on the artificial substrate. Ephemeroptera and Trichoptera were collected in the webbing regularly in low densities. Simmons & Winfield (1971) [46].

Sampler, using electric current, for separating aquatic insects from detritus. Fahy (1972) [16].

Comparison of aquatic insects collected in traps using black light, cool white light, and no light. Emerging Ephemeroptera, Hexagenia limbata and Caenis spp., preferred cool white light. Carlson (1972) [7].

ALSO SEE: McKinley, Prins & Jech [33] comments on arthropod distribution in a temporary stream, USA; Fisher & LaVoy [17] effects on benthic fauna of fluctuating water levels below a dam, USA; Särkkä [43] composition and diversity of macrofauna of an oligotrophic lake, Finland; Thibault [49] critical study of temperature regime of a Pyrenees trout stream, France; Levanidova [29] production and biomass of Ephemeroptera in rivers of the Kamchatka Peninsula, USSR.

MORPHOLOGY AND PHYSIOLOGY

Comparative thoracic morphology of 6 genera of the Leptophlebiidae. The thoracic musculature of Leptophlebia pacifica is also given. Sexual dimorphism, specific differences, and evolutionary trends in thoracic development are discussed. Tsui & Peters (1972) [54].

Comparative morphology of chloride cell complexes in gills of 16 species (from 6 families) of mayflies. Caviform cell types and coni-, bulbi-, and filiform cell complexes occur. Cells in all families have the similar function of salt absorption. Different combinations of cell types occur consistently within families. Wichard, Komnick & Abel (1972) [56].

Experimental laboratory determination of short and long term effects of low oxygen concentrations on aquatic insects. Fifty percent of individuals of mayfly species tested died after 96 hours at O_2 concentrations of 3.9 mg/liter for Ephemerella subvaria, 3.5 mg/l for Baetisca laurentina, 2.2 mg/l for Leptophlebia nebulosa, and 1.4 mg/l for Hexagenia limbata. After 30 days, 50% mortality occurred at O_2 concentrations of 4.5 mg/l for Ephemera simulans and 5.0 mg/l for B. laurentina. Continued through emergence, no mayfly tested could emerge at 96 hr LC50 O_2 values. Percentage of individuals successfully emerging increased with increased O_2 concentrations. Nebeker (1972) [34].

Comparison of oxygen consumption of Isonychia sp. and Stenonema fuscum under natural and artificial lighting conditions. Isonychia sp. used more O_2 at night (5.4 µliters/hr) than during daylight (3.6 µliters/hr). Oxygen consumption for S. fuscum was relatively constant averaging 3.4 µliters/hr. Oxygen consumption rates of Isonychia sp. reversed under reversed photoperiod. Ulanoski & McDiffett (1972) [55].

Experimental study of seasonal influence on phenol resistance of selected aquatic arthropods. Phenol resistance is greater in the winter than in summer. For example, at 20° C in summer, lethal concentration (100% mortality) of phenol after 48 hours for Cloeon dipterum was 6 mg/l but at 20° C in winter CL_{100} = 36 mg/l. Resistance was greater at 2° C, but much higher in winter (CL_{100} = 2000 mg/l) than summer (CL_{100} = 16 mg/l). Similar results were obtained in Ordella maxima where tolerance levels were higher. Growth phases must be considered in studying resistance. Alekseev (1971) [2].

Experimental determination of lethal phenol concentrations for aquatic arthropods in 48 hour tests. Fifty percent mortality occurred at 5 mg/l and 100% mortality at 6 mg/l in Cloeon dipterum. For Ordella maxima [= Neoephemera

maxima, Ed.] CL_{50} = 60 mg/l and CL_{100} = 180 mg/l. Alekseev (1971) [1].

ALSO SEE: Bohle [5] role of temperature in morphogenesis of Ephemerella ignita.

PARASITES AND SYMBIOTIC ASSOCIATES

Spirinella adipophila, parasite of Ephemera vulgata, may be a spore of a Fungi. Histological reasons for this theory are given. Arvy (1971) [4].

Description of a new species of Simuliidae Simulium (Phoretomyia) baetiphilum from West Cameroon. A new species group, the diceros-group (S. diceros and S. baetiphilum, both on baetids) is distinguished in the phoretic African simuliids. Lewis & Disney (1972) [30].

Review and discussion of literature on simuliid associations with aquatic insects, and report of Simulium spp. on dragonfly nymphs. Burton & McRae (1972) [6].

PESTICIDES AND POLLUTION

Effects of Zectran® insecticide on fish and aquatic insects in Bear Valley Creek, Idaho, USA. Fish were unaffected. An increase in drift of immature Heptageniidae and certain other insect groups occurred immediately after insecticide spraying, but total standing crop remained unchanged. Gibson & Chapman (1972) [18].

Effects of Dursban® insecticide on fish and aquatic invertebrates in replicate ponds, Missouri, USA. Concentrations at 0.01 lb active ingredient per acre reduced insect numbers; at 0.05 lb/A caddisflies were eliminated, mayflies reduced to 1/10th, and Chironomidae also greatly reduced. Fish mortality was high. Macek, Walsh, Hogan & Holz (1972) [31].

Biological description using aquatic invertebrates of the Ishikari River, Hokkaido, Japan. Benthic fauna is abundant and diverse at the river source. Coal mine effluents, pulp mill effluents, fertilizer effluents, sewage, and industrial effluents reduce the fauna to a few tolerant organisms. A saprobic system analysis can be used with all the river contaminants except coal mine silt. Tsuda, Watanabe & Tani (1970) [53].

ALSO SEE: Nebeker [34] effects of low oxygen over short and long time periods on survival and emergence of aquatic insects; Alekseev [1] [2] effects of phenol on aquatic insects and arachnids; Simmons [45] effects of acid-mine drainage on stream benthos.

REVIEWS

Review of recent research in water pollution and effects on freshwater invertebrates. Mackenthun & Keup (1972) [32].

Review of recent research on the productivity and ecology of benthic invertebrates of the Yoshino River, Japan. Tsuda (1972) [52].

ALSO SEE: Burton & McRae [6] review of literature on simuliid-aquatic insect associations.

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ADDRESSES

New addresses of Ephemeropterists and all obtainable addresses of authors listed in the Recent Ephemeroptera Literature are included. Address changes are typed in capital letters.

V. A. Alekseev
Institute of the Biology of Inland Waters
Academy of Sciences of the USSR
P/O Borok, Jaroslavskoi obl.,
Nekouz, USSR

R. K. Allen
Department of Zoology
California State College at Los Angeles
5151 State College Drive
Los Angeles, California 90032, USA

L. Arvy
Laboratoire d'Histoenzymologie
Faculté de Médecine
45, rue des Saints-Pères
Paris 6°, France

H. W. Bohle
Zoologisches Institut
Fachbereich Biologie der Philipps-Universität
355 Marburg/Lahn
Ketzerbach 63, Germany (DBR)

G. J. Burton
Landow Building, Room C309
NIH, National Cancer Institute
Bethesda, Maryland 20014, USA

D. Carlson
Washington Park High School
Racine, Wisconsin 53403, USA

H. F. Clifford
Department of Zoology
The University of Alberta
Edmonton 7, Alberta, Canada

K. L. Dickson
Department of Biology
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061, USA

O. P. Dubey
School of Entomology
St. John's College
Agra-2, U. P., India

G. F. Edmunds, Jr.
Department of Biology
University of Utah
Salt Lake City, Utah 84112, USA

J. M. Elliott
Freshwater Biological Association
The Ferry House, Far Sawrey
Ambleside, Westmorland, England

E. Fahy
National Institute for Physical Planning and Construction Research
St. Martin's House
Waterloo Road
Dublin 4, Ireland

S. G. Fisher
Department of Biology
Amherst College
Amherst, Massachusetts 01002, USA

H. R. Gibson
Idaho Cooperative Fishery Unit
University of Idaho
Moscow, Idaho 83843, USA

J. M. Glime
Boyd Hall
Plymouth State College
Plymouth, New Hampshire 03264, USA

K. Gose
7, Honmachi 2 Chome
Gojo City, Nara Prefecture
Japan

K. G. A. HAMILTON
Entomology, Research Institute
Central Experimental Farm
Ottawa, Ontario K1A PC6, Canada

T. M. Hinckley
School of Forestry, Agricultural Building
University of Missouri - Columbia
Columbia, Missouri 65201, USA

F. P. IDE
P. O. Box 10
Washago, Ontario, Canada

S. Inagaki
Laboratoire de Génétique évolutive
et de Biométrie du CNRS
91-Gif-sur-Yvette
France

S. L. JENSEN
Department of Life Sciences
Southwest Missouri State College
Springfield, Missouri 65802, USA

H. D. Kennedy
Bureau of Sport Fisheries and
Wildlife
Pesticide Surveillance Project
Room 9001, P. O. Box 1306
Albuquerque, New Mexico 87103, USA

T. E. Langford
C.E.R.L., Freshwater Biology Unit
c/o Scientific Services Centre
Ratcliffe-on-Soar, Nottingham NG 11 OEE
England

D. M. Lehmkuhl
Department of Biology
University of Saskatchewan
Saskatoon, Saskatchewan, Canada

I. M. Levanidova
Biology and Pedology Institute
Far-Eastern Scientific Center
USSR Academy of Sciences
690022 Vladivostok, USSR

K. J. Macek
Bionomics Inc.
Wareham, Massachusetts 02571, USA

K. M. Mackenthum
Applied Technology Division
EPA, Office of Air and Water Programs
Washington, D. C. 20460, USA

A. V. Nebeker
EPA, National Environmental Research
Center
200 Southwest 35th St.
Corvallis, Oregon 97330, USA

W. D. Pearson
Department of Biological Sciences
North Texas State University
Denton, Texas 76203, USA

J. J. Peterka
Department of Zoology
North Dakota State University
Fargo, North Dakota 58102, USA

W. L. Peters
Univ. P. O. Box 111
Florida A & M University
Tallahassee, Florida 32307, USA

R. Prins
Department of Biology
Western Kentucky University
Bowling Green, Kentucky 42101, USA

V. Puthz
Limnologische Flussstation des Max-
Planck-Institut für Limnologie
6407 Schlitz/Hessen
Postfach 102, Germany (DBR)

W. K. Reisen
Department of Zoology
University of Oklahoma
Norman, Oklahoma 73069, USA

F. Ressl
A-3251 Purgstall a. D. Erlauf No. 8
Nieder Österreich, Austria

J. Särkkä
Jyväskylän Yliopisto
Biologian Laitos
Vapaudenkatu 4
40100 Jyväskylä 10, Finland

G. M. Simmons, Jr.
Department of Biology
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia 24061, USA

M. Thibault
Laboratoire de Zoologie, E.N.S.A.
65 rue de St. Brieuc
35-Rennes, France

A. Tjønneland
Zoologisk Laboratorium
Bergen, Norway

O. A. Tshernova
Department of Entomology
University of Moscow
Leninskije Gory
Moscow W-234, USSR

M. Tsuda
Zoological Institute
Faculty of Science
Nara Women's University
Nara, Japan

P. T. P. Tsui
University P. O. Box 111
Florida A & M University
Tallahassee, Florida 32307, USA

J. T. Ulanoski
Division of Water Quality
Department of Environmental Resources
P. O. Box 2351
Harrisburg, Pennsylvania 17105, USA

W. Wichard
Institut für Cytologie und
Mikromorphologie der Universität
53 Bonn
Gartenstrasse 61a, Germany (DBR)

W. R. WOODALL, Jr.
Environmental Specialist
Georgia Power Company
791 Dekalb Industrial Way
Decatur, Georgia 30033, USA

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ADDENDUM

Dr. Edgar F. Riek of the CSIRO, Canberra, Australia, is spending a year at Florida A & M University as a research associate. He is currently studying phylogeny and relationships of certain Leptophlebiidae. His wife is accompanying him. Dr. G. F. Edmunds, University of Utah, Salt Lake City, and Dr. H. H. Ross, University of Georgia, Athens, will also be in Tallahassee in April, 1973, where they will visit the Laboratory of Aquatic Entomology and participate in a conference on Methods of Phylogeny.