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William L. Peters

Janice Peters

EATONIA

No. 19 Florida A & M University, Tallahassee September 23, 1974

Eatonia is produced with the help of all workers on Ephemeroptera. We sincerely thank all those who have sent reprints and we continue to request articles, news items, comments, or suggestions. Special thanks go to U. Jacob who did the illustrations for this issue.

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

Planning for the Second International Conference on Ephemeroptera continues. We remind all interested persons to contact I. Müller-Liebenau for information.

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There is now one international center for the establishment of journal title abbreviations, the Centre International d'Enregistrement des Publications en Série, 20, rue Bachaumont, 75002 Paris. Their publication International List of Periodical Title Word Abbreviations (1970) should be ordered from ICSU-AB Secrétariat, 17, rue Mirabeau,

75016 Paris, and supplements to the 1970 list are ordered from Mrs. M. Rosenbaum, Director ICRSP, 20, rue Bachaumont, 75002 Paris. The International List is temporarily out of print, but supplements are available.

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The 1974 meetings of the Midwest Benthological Society, held in Cincinnati, Ohio, brought together many North American Ephemeroptera workers for an informal symposium on current developments in mayfly ecology and systematics. Participants included W. L. Peters (chairman), R. K. Allen, P. H. Carlson, G. F. Edmunds, C. R. Fremling, J. Jones, P. A. Lewis, W. P. McCafferty, and M. L. Pescador. Data on Ephemeroptera were presented in numerous papers in sessions on benthic sampling and effects of introduced substances on benthos. In addition, R. J. Hall, L. Berner & E. Cook presented "Observations on the biology of Tricorythodes atratus McDunnough (Ephemeroptera: Tricorythidae) in the headwaters of the Mississippi," and A. V. Provonsha & W. P. McCafferty spoke on "Techniques for association aquatic insect stages." C. R. Fremling showed the film The Mayfly: Ecology of an Aquatic Insect at a noon luncheon. This beautiful and highly recommended film has recently won the Golden Eagle Award for nature films. Special thanks go to P. A. Lewis, host for Ephemeroptera workers, and R. Sinclair, program chairman, for a most enjoyable meeting.

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We have received some questions concerning O. A. Tshernova's 1972 paper on Asian Ephemerellidae cited in Eatonia # 18 [69]. The synonyms Cincticostella = Asiatella and Cincticostella tshernovae (Baikova) = C. imanishii (Allen) were included in an addendum at the end of this paper. Originally published in the Russian language journal Entomologicheskoe Obozrenie, the English translation Entomological Review accidentally omitted the addendum.

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R. W. Koss writes that he is no longer in the field of entomology, and suggests that other workers might wish to remove his name from their reprint mailing lists. Requests for reprints by Dr. Koss should be addressed to G. F. Edmunds.

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Streams and Ponds, a set of multilithed study guides (trial material), has recently been prepared by the Ecological Field Guide Project, UNDP (UNESCO), at the University of the South Pacific, Fiji. There are three parts, a Teachers' Guide (1973), Students' Exercises (1973), and a Reference Booklet (1974). The guides give a basic outline of freshwater ecology and findings on aquatic fauna and flora of Fiji. "The macrofauna of freshwaters," p. 63-87 in the Reference Booklet, was prepared by J. McLean who also served as photographer for the project; McLean reports three unnamed species of Ephemeroptera. These works provide an excellent beginning for serious study of the limnology of Fiji and other South Pacific islands.

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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.

Limnology of a Small Malayan River Sungai Gombak, by J. E. Bishop, 1973, Monogr. Biol. 22, Junk, The Hague, 485 p.

Sungai Gombak represents the results of an extensive two-year study on the limnology of a tropical stream in Malaya. Large parts of the book are devoted to physical and chemical characteristics, algae, and vertebrates. In the section on invertebrates, 44 species of Ephemeroptera are recorded, their longitudinal distribution and habitat preferences discussed, and their food preferences noted. Similar data are given for all invertebrates. Zonation, community structure, species segregation, seasonal variation, vertical distribution, production, drift, and vectored imaginal flight are also treated. While conclusive results were not always possible, the discussions of the problems studied could stand by themselves in a second book.

Although limited by a lack of data on taxonomy and life histories of most invertebrates, the author manages to draw many interesting conclusions concerning this tropical stream. There is high diversity, an at best modest production rate, and a lack of cyclicity in seasonal development. Hatching was continuous, development of any particular species asynchronous, and population increases more dependent on habitat stability (lack of flooding) than on any seasonal pattern. Also of interest was the apparent downstream flight of imagos.

It is impossible to review this book in any detail or to treat its other major divisions. Suffice it to say it is filled with tables and figures, a large bibliography, and enough information and theory to become a reference work for future studies on tropical streams.

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Pesticides and Freshwater Fauna, by R. C. Muirhead-Thomson, 1971, Academic Press, New York, 248 p.

This book was written to try "to bring together, under one cover, the most significant problems in pesticide impact on freshwater, and the most significant evaluation methods . . ." Basic terms and techniques are defined in an initial chapter on fish; then the major direct uses of pesticides in freshwater (control of trash fish, molluscs, and biting flies) are each reviewed in a separate chapter. The remaining two chapters concern the impact of pesticides on invertebrates and the physical-chemical properties of water and their action on pesticides. Within the chapter on invertebrates, roughly 8 pages (p. 167-175) are devoted to "Impact of various insecticides on caddis flies, mayflies and stoneflies," involving 15 references and new data of the author. While the references are well chosen and the information well presented, one wishes that more would have been included. In this respect we recommend the discussion in Dr. Muirhead-Thomson's recent paper cited in this Eatonia [46]. By trying to cover many facets of pesticide uses and problems, specialized treatments are brief. Still, Pesticides and Freshwater Fauna makes available a wealth of information in a useful, convenient form.

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Nymphs: A Complete Guide to Naturals and Their Imitations, by E. Schweibert, 1973, Winchester Press, New York, 339 p.

This beautiful book for fishermen in North American trout streams is filled with anecdotes, descriptions, and instructions for tying imitation flies for selected species of nymphs of Plecoptera, Odonata, Trichoptera, and Ephemeroptera, with shorter sections devoted to Crustaceans, Neuroptera, Coleoptera, Hemiptera, and Diptera. The book is distinguished by its original illustrations, all done by the author — 149 species of mayfly nymphs are illustrated in full color. Unfortunately, the taxonomy is not as good as the drawings. For example, four Epeorus synonyms are figured twice (E. vitreus = E. humeralis, E. longimanus = E. proprius, E. albertae = E. youngi, E. pleuralis = E. fraudator) while all Baetisca nymphs are treated together as the species are "virtually indistinguishable."

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River Ecology and Man, edited by R. T. Oglesby, C. A. Carlson & J. A. McCann, 1972, Academic Press, New York, 465 p.

We normally discuss only books concerning Ephemeroptera or stream ecology, but this is an exception. Only two papers in this book have any direct relationship to mayflies: K. W. Cummins' zoological description of a river (cited in this issue) and T. E. Langford's paper on effects of thermal effluents on rivers (Eatonia # 17). Otherwise, mayflies, when mentioned, are generally part of the historical record. But the book is a fascinating account of river use and management from a variety of perspectives, and it is well organized.

River Ecology and Man is the result of the Symposium on River Ecology and the Impact of Man, University of Massachusetts, Amherst, 1971. It opens with three varying definitions of a river — geomorphological, zoological, and botanical — and proceeds to give case histories of six rivers. The rivers are

reviewed as broadly as possible, giving benefits, needs, and problems of use. These include the Thames, the oldest and best documented of managed rivers; the Delaware, a small river providing municipal and industrial water for a large population; the Illinois, used for sewage disposal and navigation; the Nile and the Columbia, both dammed for hydroelectricity and irrigation, but at latitudes different enough to present special problems; and the Danube, a truly "multiple use" river touching eight countries with a grand variety of needs and uses.

The third division of the book covers "Effects of River Use," a group of reviews of specialized topics of varying levels of interest depending on the reader: discharge, morphometric changes, sedimentation, thermal problems, pesticides and industrial wastes, radionucleides, and nutrients. The final division is devoted to multiple use: its reasons, economics, and politics. Each major division is followed by a commentary by an expert in the field. Also scattered within the remaining papers and commentaries are smaller case histories, some as interesting or more interesting than the major presentations. All in all, a recommended book.

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The Mayfly, by R. E. Hutchins, illustrated by J. D. Zallinger, 1970, Addison-Wesley, Reading, Mass., 48 p.

This is a book we shouldn't mention, except we fear someone might buy it. The book is intended as a popular work on natural history for children from 9-12. The text is reasonably accurate, but sometimes oversimplified to a degree that is misleading. Our quarrel is not with the text but with the illustrations which comprise more than 2/3 of the book. A scientific note says the work is about Ephemerella but there are no drawings of Ephemerella. Some of the figures can be vaguely assigned to other families, some have wing pads like Zygoptera, and one has 8 gills. One figure of a copulating male riding on the back of a female directly contradicts the text. The book is a disappointment.

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The following two papers are not included in the Recent Ephemeroptera Literature because we have been unable to obtain copies so far. We do know that they are important taxonomic works, so we mention their existence now. In some future issue, we will cite them again and include them in Eatonia Index.

Baikova, O. Ya.

-1972. K poznaniyu podenok basseina Amura: I. Imagines (Ephemeroptera: Ephemerellidae). [Contribution to knowledge of mayflies of the Amur Basin: I. Imagines (Ephemeroptera: Ephemerellidae).] Izv. Tikhookean. Nauch.-Issled. Inst. Ryb. Khoz. Okeanogr., 77:178-206.

-1972. K poznaniyu podenok (Ephemeroptera) basseina Amura: II. Imagines (Rhithrogena, Heptagenia). [Contribution to knowledge of mayflies (Ephemeroptera) of the Amur basin: II. Imagines (Rhithrogena, Heptagenia).] Izv. Tikhookean. Nauch.-Issled. Inst. Ryb. Khoz. Okeanogr., 77:207-232.

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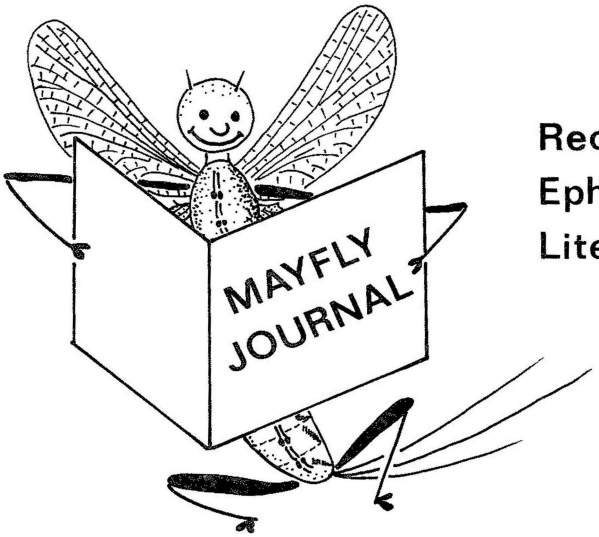

Recent Ephemeroptera Literature

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

Ali, S. R.

[1] -1971. Certain mayfly nymphs (Order; Ephemeroptera) of Azad Kashmir and Swat. Pak. J. Sci., 23:209-214, 46 figs.

Allen, R. K.

[2] -1974. Neochoroterpes, a new subgenus of Choroterpes Eaton from North America (Ephemeroptera: Leptophlebiidae). Can. Entomol., 106:161-168, 19 figs.

[3] -1973. New species of Leptohyphes Eaton (Ephemeroptera: Tricorythidae). Pan-Pac. Entomol., 49:363-372, 22 figs.

Brittain, J.

[4] -1973. Døgnfluers funksjon i økosystemet. [The function of mayflies (Ephemeroptera) in the ecosystem.] (in Norwegian, English summary) Fauna (Oslo), 26:198-206, 3 figs.

Brusven, M. A. & C. MacPhee

[5] -1974. An evaluation of squoxin on insect drift. Trans. Am. Fish. Soc., 103:362-365, 1 fig., 1 table.

Butz, I.

[6] -1973. Strömungsverhalten von Ephemerella ignita (Ephemeroptera). Oikos, 24:469-472, 1 fig.

Chaston, I.

[7] -1972. Non-catastrophic drift in lotic systems, p. 33-51, 5 figs., 3 tables, IN Clark, R. B. & R. J. Wootton [eds.], Essays in Hydrobiology Presented to Leslie Harvey. Univ. Exeter, Exeter. 136 p.

Chutter, F. M.

[8] -1973. An ecological account of the past and future of South African rivers. News Lett. Limnol. Soc. South. Afr., 21:22-34.

Corbet, S. A., J. Green, J. Griffith & E. Betney

[9] -1973. Ecological studies on crater lakes in West Cameroon. Lakes Kotto and Mboandong. J. Zool., Lond., 170:309-324, 6 figs.

Corbet, S. A., R. D. Sellick & N. G. Willoughby

[10] -1974. Notes on the biology of the mayfly Povilla adusta in West Africa. J. Zool., Lond., 172:491-502, 9 figs., 1 table.

Cummins, K. W.

[11] -1972. What is a river? — Zoological description, p. 33-52, 5 figs., 1 table, IN Oglesby, R. T. et al. [eds.], River Ecology and Man (Proc. Int. Symp. River Ecol. Impact Man, 1971). Academic Press, New York. 465 p.

Dahlby, R.

[12] -1973. A check-list and synonyms of the Norwegian species of Ephemeroptera. Norsk Entomol. Tiddskr., 20:249-252.

Décamps, H. & R. Rouch

[13] -1973. Recherches sur les eaux souterraines 19. Le système karstique du Baget. I. Premières estimations sur la dérive des invertébrés aquatiques d'origine épigée. Ann. Spéléol., 28:89-110, 9 figs., 12 tables.

Demoulin, G.

[14] -1973. Éphéméroptères de Madagascar. III. Bull. Inst. R. Sci. Nat. Belg., Entomol., 49(7):1-20, 9 figs.

[15] -1973. Contribution à l'étude des Éphéméroptères d'Israel: Introduction et I. Heptageniidae. Bull. Inst. R. Sci. Nat. Belg., Entomol., 49(8): 1-19, 10 figs.

[16] -1974. Remarques critiques sur les Acanthametropodinae et sur certaines formes affines (Ephemeroptera Siphlonuridae). Bull. Inst. R. Sci. Nat. Belg., Entomol., 50(2):1-5.

Dorgelo, J. & N. Lair

[17] -1973. Downstream drift in two brooks of Auvergne: preliminary observations. Ann. Stn. Biol. Besse-en-Chandesse, 8:103-117, 7 figs.

Fahy, E.

[18] -1973. Observations on the growth of Ephemeroptera in fluctuating and constant temperature conditions. Proc. R. Irish Acad., B, 73:133-149, 11 figs., 7 tables.

[19] -1974. Distribution data on the Ephemeroptera and Plecoptera in Ireland. Entomol. Gaz., 25:141-146, 3 figs., 1 table.

Fremling, C.

[20] -1973. Environmental synchronization of mass Hexagenia bilineata (Ephemeroptera) emergences from the Mississippi River. Verh. Int. Ver. Theor. Angew. Limnol., 18:1521-1526, 2 figs.

Frempong, E. & B. Nijjhar

[21] -1973. Some preliminary observations on the fauna and flora of Barekese Lake, Ghana. Bull. Inst. Fondam. Afr. Noire, Sér. A, 35:67-78, 3 figs., 3 tables.

Green, J., S. A. Corbet & E. Betney

[22] -1974. Ecological studies on crater lakes in West Cameroon. Debundsha Lake. J. Zool., Lond., 173:199-223, 17 figs., 2 tables.

Hayden, W. & H. F. Clifford

[23] -1974. Seasonal movements of the mayfly Leptophlebia cupida (Say) in a brown-water stream of Alberta, Canada. Am. Midl. Nat., 91:90-102, 7 figs., 1 table.

Helan, J., F. Kubíček, B. Losos, E. Sedlák & M. Zelinka

[24] -1973. Production conditions in the trout brooks of the Beskydy Mountains. Results of the research carried out within the framework of the I. B. P. in the years 1966 to 1971. Folia Fac. Sci. Nat. Univ. Purkynianae Brun., Biol. 38, 14(4):1-105, 35 figs., 54 tables.

Holopainen, I. J.

[25] -1973. Päivänkorentojen (Ephemeroptera) lisääntymisbiologiasta ja eliniästä. [On the breeding biology and life length of mayflies (Ephemeroptera).] (in Finnish) Luonnon Tutkija, 77:32-37, 7 figs.

Hunt, P. C. & J. W. Jones

[26] -1972. The profundal fauna of Llyn Tegid, North Wales. J. Zool., Lond., 168:9-49, 31 figs., 13 tables, 1 appendix.

Hynes, H. B. N.

[27] -1974. Further studies on the distribution of stream animals within the substratum. Limnol. Oceanogr., 19:92-99, 1 fig., 3 tables.

Jacob, U.

[28] -1973. Zum systematischen Status von Cloeon szegedi Jacob, 1969 (Baetidae, Ephemeroptera). Folia Entomol. Hung. (Ser. Nova), 26 suppl.: 91-95, 4 figs.

[29] -1974. Die bisher nachgewiesenen Ephemeropteren der Deutschen Demokratischen Republik. Entomol. Nachr., 18:1-7.

Jaeger, D.

[30] -1972. Faunistisch-ökologische Untersuchungen an wasser lebenden Insektenlarven (Trichopteren, Plecopteren und Ephemeropteren) in der Wiehl, einem Wiesen-Mittelgebirgsbach im oberbergischen Land. Decheniana, 125:23-41, 2 figs., 4 tables, 4 plate figs.

Jażdżewska, T.

[31] -1972. Fauna Niebieskich Źródeł. Jętki (Ephemeroptera) na terenie rezerwatu. [Fauna of Niebieskich Źródła: Mayflies (Ephemeroptera) of the preserve.] (in Polish, English summary) Zesz. Nauk. Uniw. Łodz., Nauki Mat.-Przyr., Ser. II, 46:35-39, 1 table.

[32] -1973. Notes on the biology and ecology of the mayfly Ametropus eatoni Brodskij (Ephemeroptera). Uwagi o biologii i ekologii jętki Ametropus eatoni Brodskij (Ephemeroptera). Pol. Pismo Entomol., 43:469-477, 4 figs.

Kacalova, O. & I. Skrube (or Kachalova, Katshalova)

[33] -1971. Jaunas zīpas par Latvijas PSR upju viendienītēm (Ephemeroptera). Novye dannye o podenkakh rek Latviyskoi SSR (Ephemeroptera). [New data on mayflies of Latvian SSR rivers (Ephemeroptera).] (in Latvian, Russian summary) Latv. Entomol., 13:15-25, 1 fig.

Koslucher, D. G. & G. W. Minshall

[34] -1973. Food habits of some benthic invertebrates in a northern cool-desert stream (Deep Creek, Curlew Valley, Idaho-Utah). Trans. Am. Microsc. Soc., 92:441-452, 1 fig., 4 tables.

Kownacki, A. & M. Kownacka

[35] -1973. Rozmieszczenie fauny dennej w kilku potokach Bałkanu Środkowego w okresie letnim. The distribution of the bottom fauna in several streams of the Middle Balkan in the summer period. Acta Hydrobiol., 15:295-310, 1 fig., 4 tables.

Kubíček, F., J. Libosvársky & S. Lusk

[36] -1972. Research on two small trout streams (Czechoslovakia), p. 857-870, 4 figs., 7 tables, IN Kajak, Z. & A. Hillbricht-Ilkowska [eds.], Productivity Problems of Freshwaters (Proc. IBP-UNESCO Symp. Prod. Probl. Freshwaters, Poland, 1970). Warszawa-Kraków.

Lichtenberg, R.

[37] -1972. Hydrobiologische Untersuchungen an einem südlich von Wien gelegenen Ziegelteich (Hallateich). Sitzungsber. Österr. Akad. Wiss., Math.-Naturwiss. Kl., I, 180:280-316, 9 figs.

[38] -1973. Die Entwicklung einiger charakteristischer Benthosorganismen des „Hallateiches" südlich von Wien. Ann. Naturhist. Mus. Wien, 77:305-311, 2 figs., 1 table.

Mason, W. T., Jr., C. I. Weber, P. A. Lewis & E. C. Julian

[39] -1973. Factors affecting the performance of basket and multiplate macroinvertebrate samplers. Freshwater Biol., 3:409-436, 11 figs., 11 tables, 1 plate.

Mayo, V. K.

[40] -1973. A new species of Baetis from Ecuador (Ephemeroptera: Baetidae). Pan-Pac. Entomol., 49:285-288, 10 figs.

[41] -1973. Four new species of the genus Baetodes (Ephemeroptera: Baetidae). Pan-Pac. Entomol., 49:308-314, 28 figs.

McCafferty, W. P.

[42] -1973. Commentary on the genus Ichthybotus (Ephemeridae) and the misplaced I. dodecus Dubey. Orient. Insects, 7:351-352.

McCafferty, W. P. & G. F. Edmunds, Jr.

[43] -1973. Subgeneric classification of Ephemera (Ephemeroptera: Ephemeridae). Pan-Pac. Entomol., 49:300-307, 22 figs.

Meyer-Rochow, V. B.

[44] -1971. Fixierung von Insektenorganen mit Hilfe eines Netzmittels. Das Dorsalauge der Eintagsfliege Atalophlebia costalis. Mikrokosmos, 60:348-352, 9 figs.

Meynell, P. J.

[45] -1973. A hydrobiological survey of a small Spanish river grossly polluted by oil refinery and petrochemical wastes. Freshwater Biol., 3:503-520, 8 figs., 3 tables.

Muirhead-Thomson, R. C.

[46] -1973. Laboratory evaluation of pesticide impact on stream invertebrates. Freshwater Biol., 3:479-498, 3 tables, 2 plates.

Müller, K.

[47] -1972. Rytmiskt beteend hos djur i den subarktiska sommaren. [Rhythmic behavior in animals.] (in Swedish, English summary) Fauna & Flora (Stockh.), 67:23-29, 11 figs.

[48] -1973. Circadian rhythms of locomotor activity in aquatic organisms in the subarctic summer. Aquillo, Ser. Zool., 14:1-18, 27 figs.

Müller-Liebenau, I.

[49] -1973. Systematisch-ökologische Beziehungen zwischen europäischen und aussereuropäischen Baetidae (Insecta, Ephemeroptera). Verh. Int. Ver. Theor. Angew. Limnol., 18:1505-1511, 2 figs.

Muravlyeva, P. E. & O. V. Zhitnikova (or Muravleva)

[50] -1973. Donnaya fauna prudov rybkhoza "Karamet-Niyaz." [Benthic fauna of ponds of the Karamet-Niyaz fish-breeding farm.] Izv. Akad. Nauk Turkm. SSR, 1973(4):45-51, 2 figs.

Nuttall, P. M.

[51] -1973. The effects of refuse-tip liquor upon stream biology. Environ. Pollut., 4:215-222, 1 fig., 2 tables.

Nuttall, P. M. & G. H. Bielby

[52] -1973. The effect of china-clay wastes on stream invertebrates. Environ. Pollut., 5:77-86, 2 figs., 4 tables.

Oehme, G.

[53] -1972. Zur maximalen Lebensdauer von Cloeon dipterum L. (Eph. Baetidae). Entomol. Nachr., 16:131-133.

Perret, P.

[54] -1973. Untersuchungen über die Bodenfauna des Litorals im eutrophierenden Sempachersee. Schweiz. Z. Hydrol., 35:69-113, 8 figs., 9 tables.

Pescador, M. L. & W. L. Peters

[55] -1974. The life history and ecology of Baetisca rogersi Berner (Ephemeroptera: Baetiscidae). Bull. Fla. State Mus., 17:151-209, 25 figs., 12 tables.

Petr, T.

[56] -1974. Dynamics of benthic invertebrates in a tropical man-made lake (Volta Lake 1964-1968). Standing crop and bathymetric distribution. Arch. Hydrobiol., 73:245-265, 6 figs., 3 tables.

Poinar, G. O., Jr. & J. J. Doelman

[57] -1974. A reexamination of Neochordodes occidentalis (Montg.) comb. n. (Chordodidae: Gordioidea): larval penetration and defense reaction in Culex pipiens L. J. Parasitol., 60:327-335, 17 figs.

Puthz, V.

[58] -1974. Niekol'ko Ephemeropter z Juhoslávie, prevažne z Čiernej Hory a Srbska. Einige Ephemeropteren aus Jugoslawien, vorwiegend aus Montenegro und Serbien (Insecta, Ephemeroptera). Acta Rerum Nat. Mus. Natl. Slovaci, Bratislava, 19:147-156, 2 figs.

Rosowski, J. M. & P. Kugrens

[59] -1973. Observations on the euglenoid Colacium with special reference to the formation and morphology of attachment material. J. Phycol., 9: 370-383, 22 figs., 2 tables.

Rothschein, J.

[60] -1973. O vplyve plánovaných dunajských vodných diel na hydrofaunu československého úseku Dunaja. Über den Einfluss der geplanten Donaukraftwerke auf die Hydrofauna des tschechoslowakischen Donauabschnittes. Acta Rerum Nat. Mus. Natl. Slovaci, Bratislava [Zb. Slov. Nar. Mus. Prír. Vedy], 19:79-97, 2 figs., 6 tables.

Rupprecht, R.

[61] -1973. Die Schwereorientierung von Imagines und Larven von aquatisch lebenden Insekten ausserhalf des Wassers. The gravity orientation of imagos and larvae of aquatic insects outside of water. Orientation géotactique des larves et imagos d'insectes aquatiques hors de l'eau. Forma & Functio, 6:323-336, 6 figs.

Săftoiu, A.

[62] -1969. Phénomènes de neurosécrétion des imagos d'Éphéméroptères (Insecta, Ephemeroptera). Rev. Roum. Biol., Sér. Zool. (Bucarest), 14:411-420, 7 figs., 1 plate.

[63] -1970. La neurosécretion cérébrale aux stades avancés des espèces de Caenis (Fam. Caenidae, O. Ephemeroptera). Rev. Roum. Biol., Sér. Zool. (Bucarest), 15:153-158, 1 fig., 2 plates.

Samaan, A. A. & A. A. Aleem

[64] -1973. The ecology of zooplankton in Lake Mariut, Egypt. Bull. Inst. Oceanogr. Fish., 2:339-371, figs.

Selgeby, J. H.

[65] -1974. Immature insects (Plecoptera, Trichoptera, and Ephemeroptera) collected from deep water in western Lake Superior. J. Fish. Res. Board Can., 31:109-111, 1 fig., 1 table.

Sinitchenkova, N. D.

[66] -1973. K poznaniyu roda Rhithrogena Eaton. (Ephemeroptera, Heptageniidae). [To the question about the knowledge of the genus Rhithrogena (Ephemeroptera, Heptageniidae).] Vestn. Mosk. Univ., Biol., Pochvoved., 1973(3):16-22, 2 figs.

[67] -1973. Lichinki podenok palearkticheskikh vidov roda Rhithrogena Eaton (Ephemeroptera, Heptageniidae). [Mayfly larvae of the palaearctic species of the genus Rhithrogena Eaton (Ephemeroptera, Heptageniidae).] Vestn. Mosk. Univ., Biol., Pochvoved., 1973(5):9-17, 3 figs.

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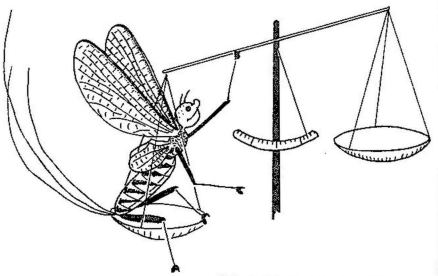
compiled by Janice G. Peters

The numbers in brackets refer to paper numbers listed in the Recent Ephemeroptera Literature. 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.



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Oligoneuriella tskhomelidzei sp. n. (female nymph; Adzhar ASSR, Georgian SSR, USSR) Sowa & Zosidze (1973) [70] p. 601.

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Key to male imagos of Palearctic species of Rhithrogena. Sinitshenkova (1973) [66].

Key to nymphs of Palearctic species of Rhithrogena. Sinitshenkova (1973) [67].

Key to nymphs of Palearctic species of Oligoneuriella. Sowa (1973) [69].

Discussion of relationships between Acanthametropus, Analetris, Siphluriscus, and Stackelbergisca. The latter 2 genera are removed from established subfamilies to a subfamily incerta status. Demoulin (1974) [16].

Systematic and ecological problems in the classification of the Baetidae, particularly in Baetis, Pseudocloeon, and related genera. Generic characters such as hind wing development and terminal filament length occur independently, in different combinations, throughout the world. The present concept of genera in Baetidae will surely change. Müller-Liebenau (1973) [49].

Discussion of relationships among Central Asian members of the Heptageniidae. Afghanurus rubrofasciatus is probably assigned incorrectly. Demoulin (1973) [15].

Ephemeroptera records from Yugoslavia, with descriptive notes on nymphs of 2 species of Ecdyonurus and one species of Baetis. Puthz (1974) [58].

Taxonomic notes on the egg, nymph, and imagos of Ametropus eatoni. Jażdżewska (1973) [32].

Description of egg and instars of Baetisca rogersi, with redescription of mature nymph and imagos. Differentiation of B. rogersi from B. becki. Pescador & Peters (1974) [55].

Cloeon szegedi placed in dipterum-complex and discussion of the dipterum-complex. Jacob (1973) [28].

Discussion of identity of Ichthybotus dodecus Dubey and designation of this species as a taxon inquirenda. McCafferty (1973) [42].

BIBLIOGRAPHY

Bibliography and list of species of aquatic insects of New Zealand. Wise (1973) [81].

BIOLOGY — life histories

Life history and ecology of Baetisca rogersi, a univoltine species from Florida, USA. Subjects included are growth, behavior (light responses, swimming, feeding, respiration, microhabitat selection), emergence, and egg number. Pescador & Peters (1974) [55].

Life cycles of some Norwegian mayflies. Baetis rhodani and Cloeon dipterum are multivoltine; Heptagenia fuscogrisea, Baetis macani, Siphlonurus lacustris, and Leptophlebia vespertina are univoltine. Size class differences between L. vespertina and L. marginata are illustrated, and nutrition, drift, and the role

of mayflies in the ecosystem are discussed. Brittain (1973) [4].

Life cycles of Baetis rhodani, B. muticus, B. scambus, Ecdyonurus venosus, Rhithrogena semicolorata, Heptagenia lateralis, Ephemerella ignita, Paraleptophlebia submarginata, and Caenis rivulorum in a stream in Ireland. The life cycles of Baetis rhodani and Ephemerella ignita are compared from a fluctuating and a constant temperature stream by "day-degrees" (temperature × time) required for development. Growth of Ephemerella ignita was temperature dependent; Baetis rhodani completed development at wide ranges of temperature. Fahy (1973) [18].

Life cycles of 2 Ephemeroptera and one Odonata species in a pond south of Vienna, Austria. The winter generation of Cloeon dipterum took 7 months while the summer generation required only 2 months to develop. Maximum duration of development for Caenis horaria was one year. Lichtenberg (1973) [38].

Ephemeroptera growth and development in the Lissuraga, a French Pyrenees trout stream. Percentage eclosion of eggs was generally highest from 15-25° C. Optimum embryonic development occurred at 25° C, except for Habrophlebia lauta (15° C) and Ephemerella ignita (10° C). Life cycles were univoltine or polyvoltine. Information is included on nymphal and adult populations, seasonal fluctuations, drift, and mayfly frequency in trout diet. Thibault IN Thibault, Cuinat & Lesel (1971) [75].

ALSO SEE: Jażdżewska [32] life cycle of Ametropus eatoni; Thibault, Cuinat & Lesel [76] data on egg development, life cycles, growth, and adult distribution of Ephemeroptera of a French Pyrenees stream; Corbet, Sellick & Willoughby [10] life cycle of Povilla adusta in a Cameroon lake, and reduced size of this species at high temperature.

BIOLOGY — adult activity

Environmental factors coordinating synchronous emergences (every 6-11 days) of Hexagenia bilineata in the Mississippi River, USA. The first early summer emergence is synchronized by temperature. In further emergences, last instar nymphs may secrete ectocrines suppressing the development of younger nymphs. Reported emergences are actually reports of observed activity. Fremling (1973) [20].

Emergence of Povilla adusta in 5 West African lakes. Lunar periodicity was evident in Barombi Mbo and another Cameroon lake, while emergences in 2 Cameroon lakes and Kainji Lake, Nigeria, were not associated with lunar phase. At Kainji Lake this may be caused by the drawdown of the lake. The lakes where emergence was associated with moon phase were much clearer than the others. Corbet, Sellick & Willoughby (1974) [10].

Swarming and mating behavior of Ephemera vulgata, Leptophlebia marginata, Siphlonurus linnaeanus, Heptagenia fuscogrisea, and Caenis horaria in Finland. Holopainen (1973) [25].

Observation of life span of virgin female imagos of Cloeon dipterum. Specimens survived 24 and 28 days. Oehme (1972) [53].

ALSO SEE: Hayden & Clifford [23] emergence and oviposition data on Leptophlebia cupida in Canada; Pescador & Peters [55] emergence of Baetisca rogersi, USA; Müller [48] review of emergence and flight activity of aquatic insects in subarctic conditions; Solem [68] information on emergence of

Leptophlebia marginata in a Norwegian lake; Sutcliffe & Carrick [71] study indicating that female imagos of Baetis rhodani avoid laying eggs in streams with a pH below 6.0

BIOLOGY — nymphal activity

The upstream "en masse" migration of Leptophlebia cupida nymphs in the Bigoray River, Alberta, Canada. Migration is initiated by high water and occurs near shore, during daylight, at an average rate of 10 m/hr, and proceeds into tributaries and then into marshes. Normally night active, L. cupida nymphs drift during daylight during migration. After emergence in the marshes, females return to the main river to oviposit. Hayden & Clifford (1974) [23].

Experimental artificial stream study of influence of current velocity on drift and direction of movement of Ephemerella ignita. At 2.5 cm/sec 50% of the nymphs moved upstream; the others moved downstream or laterally. At 7 cm/sec the nymphs moved out of the current, and at 10 cm/sec no movement was possible without drift. The species prefers calm water and has little current resistance. Butz (1973) [6].

Daily activity patterns of Leptophlebia marginata and L. vespertina in a lake in Norway. Both species showed nocturnal activity in March and April, then shifted to a diurnal pattern with midday activity in May and early June, in association with day emergence. Solem (1973) [68].

Observations on development, feeding, and behavior of nymphs of Ametropus eatoni in Polish rivers. Jażdżewska (1973) [32].

Seasonal and daily patterns of downstream drift for Baetis rhodani, Baetis sp., and Habroleptoides modesta in the Lissuraga, a French Pyrenees trout stream. A single nightly peak is evident in May (8 hrs darkness) while samples taken in March and September (12 hrs darkness) show evidence of a second peak. Thibault (1970) [73].

Drift of aquatic invertebrates, by order, in 2 small streams of Auvergne, France. Ephemeroptera exhibited a late-night peak in activity. Dorgelo & Lair (1973) [17].

ALSO SEE: Müller [47] [48] review of nymphal activity of aquatic insects in subarctic conditions; Chaston [7] review and discussion of factors influencing non-catastrophic drift in running waters; Wootton [82] fossil history of aquatic insects with discussion of the history and evolution of feeding behavior; Rupprecht [61] gravity orientation of Ephemera danica; Koslucher & Minshall [34] food habits of Baetis tricaudatus and Tricorythodes minutus in an Idaho stream, USA; Brusven & MacPhee [5] diel drift data for some Ephemeroptera species of St. Joe River, Idaho, USA; Pescador & Peters [55] nymphal behavior of Baetisca rogersi, USA; Jażdżewska [31] factors affecting distribution of Ephemeroptera species in a spring and stream of Niebieskie Źródła preserve, Poland; Kubíček et al. [36], Helan et al. [24] habitat preferences of Ephemeroptera species in 2 Czechoslovakian brooks; Perret [54] locality, depth, and habitat data for Ephemeroptera species of the Sempachersee, Switzerland; Lichtenberg [37] habitat and food preferences of some Ephemeroptera species of an Austrian pond; Décamps & Rouch [13] drift of Baetidae through a subterranean river system, France; Petr [56] Povilla in Lake Volta, Ghana.

ECOLOGY

Exposition of Monshadsky's definition of ecological factors, with discussion of effects of the following factors on aquatic invertebrates: 2 primary periodical (temperature, photoperiod), one secondary periodical (nourishment), and one independent (human activity). The discussion is partly a review and partly a presentation of finding from the Lissuraga, a French Pyrenees trout stream. Thibault & Benech (1971) [74].

Vertical distribution of invertebrates in the substratum of river and bank, Speed River, Ontario, Canada, investigated by a sampler which was installed without disturbing the substrate. While most Ephemeroptera were collected near the surface of the river, Paraleptophlebia, Ephemerella, Caenis, and Baetis were collected at depths between 27 and 54 cm. Results indicated that only a few specialized invertebrates enter the true bank, and that most reports of aquatic insects away from the river are actually concerned with gravel shoals. Hynes (1974) [27].

Seasonal changes in food habits of selected aquatic insects from Deep Creek, Idaho, USA. Among Ephemeroptera, Baetis tricaudatus and Tricorythodes minutus fed on diatoms and detritus. Detritus dominated in gut analyses of T. minutus at all stations and all seasons except winter when diatoms constituted 58% of gut contents. Results were similar for B. tricaudatus, but there was a higher percentage of diatoms and more fluctuation by station than by season. Trophic relationships in Deep Creek are discussed. Koslucher & Minshall (1973) [34].

ALSO SEE: Cummins [11] general description of communities and trophic relationships of stream animals; Brittain [4] role of mayflies in ecosystem.

FAUNAL STUDIES — geographical

Distribution of Palearctic species of Oligoneuriella. Sowa (1973) [69].

Ephemeroptera and Plecoptera species of Ireland. New county distribution records are included. Fahy (1974) [19].

Check list of Ephemeroptera species from Norway. Baetis gemellus is removed from the list of Norwegian species. Some potential synonyms are included, pending verification. Dahlby (1973) [12].

Ephemeroptera species of Latvian SSR, USSR. Heptagenia coerulans and Ephemerella mucronata are reported for the first time. Kačalova & Skrube (1971) [33].

Ephemeroptera species of Germany-DDR, from older records and new collections. Certain species should eventually be removed from the species list as they can no longer be found because of water regulation and pollution. Some potential synonyms are included. Jacob (1974) [29].

New Ephemeroptera records from Yugoslavia. Rhithrogena germanica is reported for the first time and questionable older records of Baetis gemellus are confirmed. New distribution records are included for Montenegro and Serbia. Puthz (1974) [58].

New distribution records for Rhithrogena tianschanica and R. sibirica in the USSR. Sinitschenkova (1973) [67].

Ephemeroptera records from Israel. Demoulin (1973) [15].

Ephemeroptera records from Malagasy Republic. Demoulin (1973) [14].

List and bibliography of species of aquatic insects of New Zealand. Wise (1973) [81].

FAUNAL STUDIES — limnological

Aquatic insects from bottom of Lake Superior, Apostle Islands region, USA. Nymphs of Heptagenia pulla were collected by substrate sampler in water 50 meters deep. Selgeby (1974) [65].

Profundal fauna of Llyn Tegid, Wales-UK, with seasonal distribution, abundance, and life cycles of invertebrates. Single records were made of Caenis moesta and Ephemera danica at 6 meters depth. Hunt & Jones (1972) [26].

Pre-impoundment survey of physical and chemical conditions and species of Trichoptera, Plecoptera, and Ephemeroptera of the Wiehl and tributaries, Germany-DBR. The fauna is compared with that of adjacent regions. Jaeger (1972) [30].

Ephemeroptera species of a limnocrene spring and its outflow stream, Niebieskie Źródła preserve, Poland. Jażdżewska (1972) [31].

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Zooplankton species and their ecology in Lake Mariut, Egypt, a shallow brackish-water lake. Ephemeroptera were occasionally reported from plankton hauls. Samaan & Aleem (1973) [64].

Flora and fauna (algae, plants, zooplankton, invertebrates, fish) of the man-made Barekese Lake, Ghana. Cloeon sp. nymphs were found in growths of the aquatic weed Pistia stratiotes. Frempong & Nijjhar (1973) [21].

Fauna and phytoplankton of Lakes Kotto and Mboandong, crater lakes of West Cameroon, in relation to biology and feeding of fish. Povilla adusta was present in both lakes. Corbet, Green, Griffith & Betney (1973) [9].

Fauna and phytoplankton of Debundsha Lake, a crater lake in West Cameroon. A single nymph of Cloeon was recorded. Green, Corbet & Betney (1974) [22].

ALSO SEE: Mason et al. [39] species of invertebrates collected by samplers in the Ohio and Little Miami rivers, Ohio, USA; Pescador & Peters [55] invertebrate species, including seasonal occurrence of mayfly species, of 2 north Florida creeks, USA; Szczęsny [72] invertebrate species of the Kryniczanka stream, Poland; Kubíček et al. [36] species of Ephemeroptera, Chironomidae, and fish from the brooks Lušová and Brodská, Czechoslovakia; Helan et al. [24] species of phytobenthos, zoobenthos, and fish from the brooks Lušová and Brodská, Czechoslovakia; Tuša [80] Ephemeroptera species of the Bělá Creek, Czechoslovakia; Perret [54] species of invertebrates collected from the Sempachersee, Luzern, Switzerland; Lichtenberg [37] species of mesofauna of the Hallateich, a small pond south of Vienna, Austria; Kownacki & Kownacka [35] Ephemeroptera, Plecoptera, Trichoptera, and Chironomidae species of Middle Balkan streams, Bulgaria.

HYDROBIOLOGY — running waters

Zoological categorization of a river. Using vertical (nekton, benthos) and horizontal (erosional, intermediate, and depositional habitats) compartments, the ecological assemblages (communities) of fauna are described. Trophic relationships and production are also reviewed. Cummins (1972) [11].

Effect of fluctuations of water flow from hydroelectric power dam on the bottom fauna of Upper Kennebec River, Maine, USA. Average minimum daily discharge in summer was 7.8 m^3/sec; maximum = 170 m^3/sec. The fauna was severely depleted immediately below the dam, but recovered further downstream. Certain faunal changes were associated with fluctuating flow. Iron was 6 times more abundant above than below the dam; the reverse was true for Paraleptophlebia. Trotzky & Gregory (1974) [78].

Effects of pH and calcium on the qualitative distribution of invertebrates in the River Duddon and tributaries, England-UK. An Ephemeropteran community existed only in areas where pH exceeded 5.7 throughout the year, while an impoverished, basically Plecopteran community occurred at pH below 5.7 or at fluctuating pH. Calcium abundance shows a similar relationship; however, in a discussion of the relative importance of these factors in different areas, the pH-bicarbonate concentrations are considered more important. Sutcliffe & Carrick (1973) [71].

Physico-chemical and biological characteristics of the Kryniczanka, a Carpathian mountain stream, Poland. The longitudinal distribution of invertebrates and stream zonation are affected by sewage. Baetis alpinus is the dominant mayfly species in the highest zones, but it is replaced by B. rhodani in the polluted zones. Szczęsny (1974) [72].

Results of a 5-year study on the production of phytobenthos and zoobenthos in the Brodská and Lušová brooks, Beskydy Mts., Czechoslovakia. Physical and chemical conditions and data on the density of fish stock are included. In Ephemeroptera, the average monthly production rate and average monthly biomass are given for Baetis rhodani, Rhithrogena semicolorata, and species of Ecdyonurus. Average biomass in current and bank habitats is calculated. An experimental increase in fish stock did not affect the biomass of mayflies. Helan, Kubíček, Losos, Sedlák & Zelinka (1973) [24].

Partial results of studies on the production of Ephemeroptera, Chironomidae, and fish in the Lušová and Brodská brooks, Beskydy Mts., Czechoslovakia. Calculations of the production rates of dominant species of Ephemeroptera are included. Kubíček, Libosvársky & Lusk (1972) [36].

Seasonal and longitudinal variations in biomass of mayflies in Bělá Creek, Moravia, Czechoslovakia. Even during seasons when biomass was low (300-400 individuals/m^2) mayflies were significant. Maximum peaks of occurrence were December-March and July. Slight organic pollution increased the Ephemeroptera population, but greater pollution reduced numbers and biomass. Tuša (1973) [80].

Hydrobiological description of the Danube River in Czechoslovakia and the potential effects of power plants on the fauna. The biotopes are described, with Ephemeroptera occurring only in areas of stable substrate. Rothschein (1973) [60].

Preliminary results of an ecological study of the Lissuraga, a French Pyrenees trout stream, with respect to fish and invertebrate populations and primary production. Summary results are given for egg incubation, hatching, life cycle, growth, drift, adult populations, and importance as trout food for 6 species of Ephemeroptera. Thibault, Cuinat & Lesel (1972) [76].

Preliminary results on seasonal changes in drift of surface-living aquatic invertebrates from 2 outlets of a subterranean system during floods, Ariège, France. Young Baetidae are a major component of drift at one outlet, especially in April. Many insects can apparently live underground for some time. Total numbers drifting out and past a point are calculated at 3100-1,231,700 individuals/24 hrs depending on conditions and flooding. Décamps & Rouch (1973) [13].

Physical and biological zonation of Middle Balkan streams, Bulgaria. Stream communities were dominated by Ephemeroptera, Plecoptera, Trichoptera, and Chironomidae. Two stream types are discussed — the Ribarica which is a typical "middle mountain" stream, and the unnamed streams of the Botev slopes which contain montane communities only at high elevations. As the Botev streams descend, they evaporate and contain a more stagnant water community. Ephemeroptera, with Baetis alpinus dominant, were abundant in the forest section of the Ribarica. Kownacki & Kownacka (1973) [35].

ALSO SEE: Chutter [8] history of water management and effect on fauna of South African rivers.

HYDROBIOLOGY — still waters

Two year physical, chemical, and faunal study of the Sempachersee, a facultatively oligomitic lake in Switzerland. Data are given on depth and substrate for each species of invertebrate collected. This includes 10 species of Ephemeroptera. Perret (1973) [54].

Physical, chemical, and faunal characteristics of a small pond south of Vienna, Austria. Distribution and habitat selection of each species of the benthic mesofauna are given. Centroptilum pennulatum, C. luteolum, and Procloeon pseudorufulum occupy certain pond areas influenced by weak outflow current. Lichtenberg (1972) [37].

Invertebrate colonization and biomass of Volta Lake, Ghana, from its filling to 1968. Povilla dominated the benthic fauna in 1966-1967, but declined thereafter, with seasonal fluctuations producing maximum standing crop at the end of dry season each year. There were differences in faunal composition and biomass at different areas of the lake, and reasons are discussed. The depth of the oxygenated epilimnion determined the depth of fauna, but fauna (mostly Chironomidae) was never found below 24 meters even when conditions were favorable. Povilla was usually in 1-9 meters of water. Predictions are included for future colonization and stabilization of the tropical lake. Petr (1974) [56].

ALSO SEE: Muravlyeva & Zhitnikova [50] colonization, productivity, and biomass of invertebrates of fish-breeding ponds, Turkmen SSR, USSR.

METHODS

Three year study and evaluation of the use of substrate samplers for estimating water quality in the Ohio River basin, USA. Paired basket samplers placed at shallow depths (1 and 4 feet) collected more taxa than those placed in deeper water; diversity was affected by depth. Longer exposure times (8 weeks) collected more taxa, particularly during cold weather. Number of replicates necessary and different material

composition of samplers were also studied. Results are analyzed statistically and discussed. Mason, Weber, Lewis & Julian (1973) [39].

ALSO SEE: Hynes [27] sampler for determining vertical distribution of invertebrates in substrate.

MORPHOLOGY AND PHYSIOLOGY

Microstructure of the compound eye of Atalophlebia costalis male imago studied by electron microscope. Discussion is included on techniques of fixation. Meyer-Rochow (1971) [44].

Neurosecretion of female imagos of Baetis rhodani, B. carpaticus, Cloeon dipterum, Ecdyonurus helveticus, and Rhithrogena semicolorata. Information is included on males of some of these species and Heptagenia sulphurea. The process of neurosecretory activity leading to egg (or larval) development and oviposition is described for these species with long adult lives. In addition, neurosecretory cellules are demonstrated for Ephemeroptera in the Pars lateralis, the sub-esophageal ganglion, and the metathoracic ganglion. Săftoiu (1969) [62].

Cerebral neurosecretion of Caenis robusta and C. horaria in mature nymphs, subimagos, and imagos. Neurosecretory activity increases gradually reaching its maximum in male subimagos and in female imagos. Săftoiu (1970) [63].

Experimental determination of gravity orientation for selected larval and imaginal aquatic insects. Nymphs of Ephemera danica show progeotactic orientation. Receptors may be located in bristle fields between the head and prothorax. Rupprecht (1973) [61].

ALSO SEE: Thorp & Lake [77] tolerance limit of Atalophlebia australis to cadmium.

PARASITES AND SYMBIOTIC ASSOCIATES

Life cycles and attachment material of species of the euglenoid genus Colacium. Records are included from unidentified mayfly nymphs, Nebraska, USA. Rosowski & Kugrens (1973) [59].

Mermithids of Chironomidae, with record of unidentified mermithid from unidentified mayflies, Kalinigrad Oblast, USSR. Zakhidov (1973) [83].

Developmental stage of the Gordioidea Neochordodes occidentalis and record of experimental infection of mayfly nymphs in California, USA, with preparasitic larvae. Poinar & Doelman (1974) [57].

ALSO SEE: Corbet, Sellick & Willoughby [10] association between bdelloid rotifers and nymphs of Povilla adusta in Nigerian and Cameroon lakes; Brittain [4] position of different stages of Ephemeroptera in the food chain of a stream, in relation to life cycles of some phoretic insects and intermediate stages of vertebrate parasites.

PESTICIDES AND POLLUTION

Laboratory determination of effects of selected pesticides on larvae of Odonata, Baetis, Simulium, and some other Rhodesian invertebrates. Insects were subjected to one hour continuous flow of pesticides and returned to clean water, where mortality was measured after 24 hrs. For Baetis: Thiodan at .005 parts per million caused 43% mortality; Folidal (parathion) at .002 ppm,

17% mortality; Nuvacron at 1 ppm, 46% mortality; other pesticides [DDT, Lebaycid (fenthion), Thiodan, Toxaphene, Baygon, Folidal, Dieldrin] at .01-1.0 ppm, 70-100% mortality. Simulium were also very sensitive but dragonflies were more tolerant, depending on the pesticide. There was no uniform pattern of reaction to organophosphorous compounds. The effect of pesticides on predator-prey relationships is discussed. Muirhead-Thomson (1973) [46].

Effect of squoxin (used to control Ptychocheilus oregonensis) at 0.9 mg/l for 13 hrs on drift of aquatic insects of an Idaho river, USA. There was no significant increase in drift, leading to the conclusion that squoxin had little to no effect on insects. Brusven & MacPhee (1974) [5].

Effects of refuse-tip liqour drainage on fauna of 5 streams, England-UK. Two sites did not contaminate the streams, as water percolated through rock strata before reaching them. Drainage from 3 of the areas entered streams directly, causing gross pollution characterized by massive growths of sewage fungi and low numbers and diversity of fauna. Oligochaeta were dominant. Some recovery was evident downstream from the pollution source, with Baetis rhodani the most tolerant Ephemeropteran. Nuttall (1973) [51].

Effect of china-clay wastes, producing high silt loads, on streams in England-UK. Compared with control stations, there was a severe reduction in numbers and density of species. Only Baetis rhodani, Tubificidae, and Chironomidae flourished at the polluted stations. Alteration and siltation of habitat is believed to cause these changes. Nuttall & Bielby (1973) [52].

Bacterial, fungal, algal, and invertebrate indicator classification for Polish streams. Among Ephemeroptera, Baetis bioculatus and B. rhodani tolerated levels of pollution down to α-mesosaprobity; Ecdyonurus fluminum to an intermediate αβ-mesosaprobity; E. venosus, Epeorus assimilis, Habroleptoides modesta, Rhithrogena semicolorata, and Potamanthus luteus to β-mesosaprobity; other species were less tolerant. Mayflies are saprophobous organisms generally preferring clean water, but they tolerated in this study some degree of domestic sewage and brewery waste. Because of the ecological variability of aquatic organisms, it is important to examine the entire community composition before determining saprobic grades. Turoboyski (1973) [79].

Physical, chemical, biological, and toxicological characteristics of the Rio Ojailén, Spain, a small river grossly polluted by an oil refinery and petrochemical complex. The river fauna is compared with that of 2 clean tributaries allowing establishment of an indicator system: Baetis sp. and Caenis sp. were the only Ephemeroptera found in conditions less than oligosaprobity. In the Rio Ojailén there is absolutely no macroinvertebrate fauna for 43 km below the source of pollutants. Meynell (1973) [45].

Effects of cadmium-zinc pollution from mining on invertebrates of a Tasmanian river, Australia. Heavy metal pollution markedly reduced numbers and species of Ephemeroptera and other groups, although certain leptocerid Trichoptera, Hemiptera, and Arachnida seemed to tolerate the pollution. The lethal concentration of cadmium producing 50% mortality in Atalophlebia australis after 96 hrs was experimentally determined as 1 mg/l. Thorp & Lake (1973) [77].

ALSO SEE: Mason et al. [39] use of substrate samplers to monitor water quality in Ohio River basin, USA; Szczęsny [72] effects of sewage on the qualitative and quantitative composition of benthos in the Kryniczanka stream, Poland; Tuša [80] pollution grades as indicated by species of Ephemeroptera of Bělá Creek, Czechoslovakia.

REVIEWS

Review of research on daily activity patterns of animals in subarctic conditions. The activity of larval aquatic insects is desynchronized under no-darkness summer conditions, while emergence and flight of adult insects retain clear daily patterns. Flexibility of the Circadian system is necessary at high latitudes. Müller (1973) [48].

General review of findings at Messaure Ecological Station, Sweden, on diurnal activity and its desynchronization in subarctic summer conditions. Müller (1972) [47].

Review of research on non-catastrophic invertebrate drift in running waters. Chaston (1972) [7].

Review of biological effects of water management on South African waters, with discussion of future needs and anticipated problems. Chutter (1973) [8].

Review of fossil history of aquatic insects. Wootton (1972) [82].

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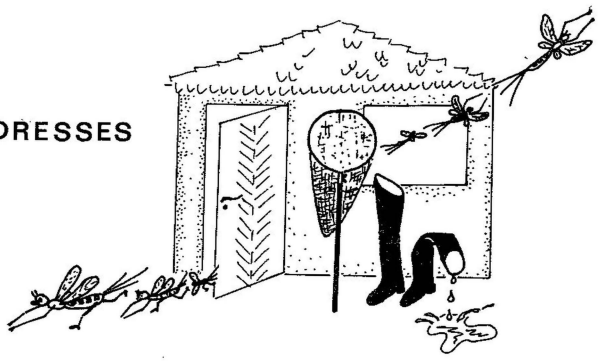

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