

The Mayflies of Europe (Ephemeroptera)

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Mayflies (Ephemeroptera) are found in lakes, ponds, streams and rivers, and provide an important food for fish, especially those in the salmonid family. The adults are copied by fly-fishermen and given a variety of common names such as the Angler's Curse, the March Brown and the Sherry Spinner. Although there are several regional guides to mayflies such as those produced by the Freshwater Biological Association (Elliott & Humpesch, 1983, 2010) and the excellent keys for Northern Europe (Engblom, 1996) and Central Europe (Bauernfeind & Humpesch, 2001), there has been no single text on European mayflies. This discrepancy has now been remedied by the publication of this impressive textbook, and the authors must be congratulated on their excellent work. Perhaps one reason for the lack of a previous publication was the large number of species to be considered. The present textbook lists 369 species in 19 families. In marked contrast, only 51 species in 10 families have been recorded in Britain and Ireland – one advantage of living on islands at the western limits of Europe! The geographical area covered by this new book is Europe west of the Ural mountains, including the Mediterranean islands, and the Maghreb region of North Africa.

A short introductory chapter provides a general outline of the book and defines some terms. The authors correctly use the term 'larva' for all the aquatic stages except the last larval instar for which the term 'nymph' is also used. As they indicate, there is often some confusion between these two terms in the literature. This is followed by a much longer General Introduction that covers the general characteristics of mayflies, the morphology of the imagines (final adult stage), sub-imagines (penultimate adult stage), and larvae, the biology of mayflies, their dispersal, diversity, distribution and biogeography, and finally their phylogeny and higher classification. The section on morphology is especially thorough and well illustrated by excellent drawings that show all the structural terms used in the species texts. Although space obviously limited the content of the section on the biology of mayflies, it is supplemented towards the end of the book by two extensive tables, the first summarises the distribution of each species in Europe and the Maghreb, and the second summarises for each species the type of life cycle, the emergence/flight period and the principal references. There are well over 2500 of the latter, providing what must be the most comprehensive guide to the literature on European Ephemeroptera. This introductory part ends with a detailed checklist of all 369 species, including families, subfamilies, genera, subgenera and species groups. I am puzzled by the 4 before the checklist title, suggesting that perhaps the introductory chapters had once been numbered.

Keys to families and subfamilies are provided next, first to male imagines and second to larvae. There are no drawings to accompany these keys and I found them hard going, even though I have been working on Ephemeroptera for 50 years. I would suggest that beginners photocopy the detailed illustrations from the introductory section on morphology so that they have some aids to help them interpret the keys. Photographs and drawings of male genitalia are provided towards the end of the book for all species known in the male imago stage. These provide some assistance, especially in the later keys to genera, but the specific points mentioned in the keys are not indicated on the illustrations. They are accompanied by photographs, some of which are very beautiful, of larvae and adults of all genera treated in this book. However, these are usually too small to assist identification. There are also SEM photographs of characteristic eggs for genera and selected species.

The species texts comprise the major part of this book and follow the same basic pattern. For each family, there is a short introduction followed by keys to genera for larvae and imagines. Then follows, for each genus, a short diagnosis and description of the larvae and imagines, an outline of the geographical distribution, a brief summary of the biology and then some remarks about identification and taxonomy. This pattern is then repeated for each species in the same genus with longer versions of each section. There is inevitably some overlap between the genus section and the species sections, but the latter are the most valuable because of their detailed descriptions. Synonymy (other names) is provided for each species. When there is only a single genus in each subfamily, no keys are provided, e.g. Siphonuridae. For the larger families, keys are provided not only to genera, but also to subgenera, e.g. Baetidae, Heptageniidae, Leptophlebiidae. These keys illustrate well the problem of trying to identify specimens without accompanying, well-labelled, illustrations. Fortunately, there are some excellent regional keys to species as noted earlier in this review. Once a species has been identified, the present text can be used to obtain detailed information on that species.

This is a beautifully produced book. The text is clearly laid out and the standard of English is high; a remarkable fact considering that it is not the first language of either author. My only criticism is the difficulty of using the keys, especially for the beginner, but this minor quibble does not detract from the value of this book which will become a standard text for many years in the future. It is the encyclopaedia of the mayflies of Europe.

References

- Bauernfeind, E. & Humpesch, U.H. (2001). *Die Eintagsfliegen Zentraleuropas (Insecta: Ephemeroptera): Bestimmung und Ökologie*. Verlag des Naturhistorischen Museums, Wien. 239 pp.
- Elliott, J.M. & Humpesch, U.H. (1983). *A Key to the Adults of the British Ephemeroptera with Notes on their Ecology*. Freshwater Biological Association, Scientific Publication No. 47. Freshwater Biological Association, Ambleside. 101 pp.
- Elliott, J.M. & Humpesch, U.H. (2010). *Mayfly Larvae (Ephemeroptera) of Britain and Ireland: Keys and a Review of their Ecology*. Freshwater Biological Association, Scientific Publication No. 66. Freshwater Biological Association, Ambleside. 152 pp.
- Engblom, E. (1996). Ephemeroptera, mayflies. In: *Aquatic Insects of North Europe: a Taxonomic Handbook, Volume 1*. (ed. A. Nilsson), 13-53. Apollo Books Aps, Stenstrup.

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Author Profile

Malcolm Elliott was a research zoologist at the Windermere Laboratory of the Freshwater Biological Association (FBA, later the Institute of Freshwater Ecology) from 1965 to 2000. Since he retired in 2000, he has been an Honorary Fellow of the FBA and continues to publish papers on the quantitative ecology of freshwater fish and invertebrates. He has taught courses in Sweden, Norway and Austria, and was an Adjunct Professor of freshwater biology in the Norwegian College of Fishery Science, University of Tromsø, Norway, from 1996 to 2006. He was then made an Emeritus Professor of the same University. He is also an Honorary Member of the FBA, an Honorary Life Member of the Fisheries Society of the British Isles (FSBI), and has been awarded the Scientific Medal of the Zoological Society of London, a certificate of excellence by the North American Plecoptera Society, and the Beverton Medal of the FSBI.