

FOREWORD

The first draft version of this book, written in English and named "Draft revision of supraspecies taxa of Ephemeroptera (without Atalophlebiinae)", was prepared as an Internet publication in 1998; thanks to Dr. Michael Hubbard (Florida A & M University), it has been available from the web site "Ephemeroptera Galactica" since 1998. The second version, written in Russian and named "Revision of supra-species taxa of Ephemeroptera (except for Atalophlebia/fg1)", was prepared as an Internet publication in 2000; from 2001 till now it has been available from the web site of Biological Faculty of S-Petersburg University, http://www.bio.pu.ru/win/entomol/KLUGE/EPHEMER_/content_.htm. Both versions contain the systematics of all mayflies except for Atalophlebia/fg1. The present Volume 1 does not contain the systematics of Turbanoculata (i. e. Baetidae auct.) nor of all Leptophlebia/fg1 (i. e. Leptophlebiidae auct.), the largest part of which belongs to Atalophlebia/fg1. The reasons for such a restriction are objective and subjective difficulties in baetid and leptophlebiid systematics. Both groups are really difficult for taxonomic revision, being geologically young, abundant and richly represented in poorly investigated tropical areas. Last years, after revisions of Holarctic baetid taxa (Novikova & Kluge 1987, Waltz & McCafferty 1987, et al.) a lot of new baetid "genera" have been described from non-Holarctic areas; many of these descriptions are insufficient and based on a few specimens only. While there is some progress in supraspecies baetid taxonomy (Kluge 1991b, 1992a, 1992b, 1997c; Novikova & Kluge 1987, 1994; Kluge & Novikova 1992), for a comprehensive revision examination of more material is necessary. That's why the systematics of Turbanoculata is excluded from this volume. As for leptophlebiids, their supraspecies revision is only started (Kluge 1994b, 1994c) and is far from finished; here also a lot of material should be examined. In future, the author hopes to prepare for publication two other volumes of this book – "Volume 2. Turbanoculata" and "Volume 3. Leptophlebia/fg1".

Parallel with the mayfly revision, a work on the book on general insect systematics is continued. The first volume of this book (which does not include

systematics of Neoptera) had two different editions in Russian – in 1999 and in 2000 (Kluge 2000). English version of this first volume is also prepared, but not published yet.

NEW TERMS, TAXA NAMES AND SYNONYMS

New terms: plesiomorphon (instead of wrongly used "plesion", p.16); basitornal margin, tornopical margin, amphitornal margin of wing or wing bud (p.31); tergalium (instead of formerly used "tergalia" or "tergalium", p.35); caudalium, tricaudale, basitricaudale, cercotractor (p.38).

For some morphological terms type taxa are designated. Till now this was not practised, but in some cases the type taxon can help to dissolve disagreements concerning usage of the term. As well as the type taxon of a taxon's name, the **type taxon of a morphological term** is an arbitrarily chosen taxon, for which the original usage of this term should be regarded to be correct independently of subsequent opinions concerning homology of this part of the body.

New circumscriptional names: Discoglossata (p. 136), Geminovenata (p.139), Fimbriatotergaliae (p. 218), Pantricyrithi (p.316), Tricoryptera (p.326), Afrotricyrithi (p.327), Tricorygnatha (327).

New family-group name: Epeorus/f (p.201).

New genus-group names: *Ecdyogymnurus* (p.181), *Thamnodontus* (p.182), *Himalogena* (p.195), *Sibirigena* (p.196), *Proepeorus* (p.204), *Albertiron* (p.205), *Sinephemera* (p.235), *Tillyardocaeis* (p. 287), *Notacanthella* (p.306).

New synonymy in species names: *alexandrae* Brodsky 1930 [*Ameletus*] = *asiacentralis* Soldán 1978 [*Ameletus*] SYN. NOV.; *ignota* Walker 1853 [*Baetis*] = *hainanensis* She et You 1988 [*Isonychia*] SYN. NOV.; *pallida* Hagen 1855 [*Oligoneuria*] = *mongolica* Soldán et Landa 1977 [*Oligoneuriella*] SYN. NOV.; *tskhomelidzei* Sowa et Zosidze 1973 [*Oligoneuriella*] = *baskale* Soldán et Landa 1977

[*Oligoneuriella*] SYN. NOV. = *zanga* Soldán et Landa 1977 [*Oligoneuriella*] SYN. NOV.; *kurenzovi* Bajkova 1962 [*Cinygma*] = *kaszabi* Landa et Soldán 1983 [*Cinygmula*] SYN. NOV.; *stackelbergi* Sinitshenkova 1973 [*Rhithrogena*] = *angulata* Braasch 1980 [*Rhithrogena*] SYN. NOV.; *pellucida* Brodsky 1930 [*Cinygma*] = *tshernovae* Braasch 1979 [*Epeorus*] SYN. NOV.; *pseudorivulorum* Keffermuller 1960 [*Caenis*] = *beskidensis* Sowa 1973 [*Caenis*] SYN. NOV.; *lepnevae* Tshernova 1949 [*Ephemerella*] = *fusongensis* Su et Gui 1995 [*Drunella*] SYN. NOV.; *submontana* Brodsky 1930 [*Ephemerella*] = *traverae* Allen et Edmunds 1963 [*Ephemerella* (*Drunella*)] SYN. NOV. = *nasiri* Ali 1971 [*Ephemerella*] SYN. NOV.; *ignita* Poda 1761 [*Ephemera*] = *antuensis* Su et You 1989 [*Ephemerella* (*Ephemerella*)] SYN. NOV.

COLLECTION DEPOSITION

Most of the mayflies mentioned in "Material examined" are deposited in Saint-Petersburg (Russia). The place of permanent deposition of this collection is the Laboratory of Insect Systematics of the Zoological Institute of Russian Academy of Sciences (RAS), but recently most part of this collection is located in the Department of Entomology of Saint-Petersburg State University, where the author works. Material deposited in other places is specially mentioned in the text as following: **Albany Mus.** – Albany Museum, Grahamstown, South Africa; **Entomol. Inst.** – Entomological Institute, Czech Academy of Sciences, České Budějovice, Czech Republic; **Florida A&M Univ.** – Florida Agricultural and Mechanical University, Tallahassee, USA.; **Kazan. Univ.** – Geological Faculty of Kazan' State University, Tatarstan, Russian Federation; **Mus. Nat. Hist. of Inst. Syst. Evol. Anim. in Krakow** – Museum of Natural History of Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Krakow; **Paleontol. Inst.** – Palaeontological Institute, Russian Academy of Sciences, Moscow; **Purdue Univ.** – Purdue University, West Lafayette, USA.

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close collaboration with the Laboratory of Insect Systematics of Zoological Institute RAS (Saint-Petersburg) and the Laboratory of Arthropods of Palaeontological Institute RAS (Moscow).

Mayflies used in this study partly were collected by the author during expeditions of S.-Petersburg State University and Zoological Institute RAS to various parts of the USSR, Mongolia and Cuba. However, this work would be impossible without examination of mayflies from various parts of the World, which the author was unable to collect himself; sincerest thanks are expressed to everybody, who gave necessary material – Y.J. Bae (South Korea), H. Barber-James (South Africa), D.E. Baumgardner (USA), C. Belfiore (Italy), S.K. Burian (USA), J.W. Early (New Zealand), S. Elliott (Chile), T. Fujitani (Japan), P. Getwongsa (Thailand), M.T. Gillies (Great Britain), T. Gonser (Switzerland), A.V. Gorokhov (Russia), V.I. Gusarov (Russia), C. Hofmann (Switzerland), S.-I. Ishiwata (Japan), V.D. Ivanov (Russia), L.M. Jacobus (USA), A.E. Korolev (Russia), P. Landolt (Switzerland), Yu.M. Marusik (Russia), W.P. McCafferty (USA), S. Melnitsky (Russia), M. Mercado (Chile), J.C. Naranjo (Cuba), J.G. Peters (USA), W.L. Peters (USA), A.V. Przhiboro (Russia), N.D. Sinitshenkova (Russia), T. Soldán (Czechia), A.H. Staniczek (Germany), D. Studemann (Switzerland), L. Sun (USA), I.V. Tatarenko (Russia), T.M. Tiunova (Russia), I. Tomka (Switzerland), X. Tong (Hong Kong), V.V. Zherichin (Russia), L.A. Zhiltzova (Russia), J. Zloty (USA).

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WARNINGS

In contrast to other taxonomic papers, this one is done in such an improved form, which makes wordily taxa diagnoses meaning. The traditional layout does not allow to do this, so readers of taxonomic papers use to study illustrations, keys, legends for phylogenetic dendrograms and other supplementary materials rather than the main text. In contrast to such literature, here all useful information is concentrated in the main text (Chapters I-VIII). The book is supplied with figures; these are illustrations for the text, but not an atlas, and the reader should not try to learn mayfly system watching the figures only.

The "Index of characters" represents an important component of the layout used here. But the reader should be prevented from possible mistakes: 1) This is an index of characters, but not an account of them; it only sends the reader to certain places of the main text, but does not give final information about taxa and their characters. For example, if there is written "Larva ... flattened dorsoventrally: *Acanthametropus*/fg1 (6), *Ametropus* (1), *Chiloporter* (2), Heptagennota (1)", it does not mean that larvae of these taxa are especially flattened, and others are not; here are only indicated places in the main text, where something is written about flatness of larva (the character No.6 in the characteristics of

Acanthametropus/fg1, etc.). It is the same as a well-known alphabetic index, but with subjects accounted not alphabetically, but according to parts of the body. 2) While this index somewhat resembles a matrix of characters used in numeric cladistics, do not try to count the characters in this index! Only those who do not understand Darwin's theory, Hennig's method, and elementary mathematics, think that counting characters can be useful (for detailed explanation see Kluge 2000 and Internet publication <http://www.bio.pu.ru/win/entomol/KLUGE/sys-ins.htm>).

Instead of traditional rank-based nomenclature, here is used a system of two non-ranking nomenclatures: the hierarchical nomenclature based on the ICZN, and the circumscriptional nomenclature; the first one is applied for each taxon, the second – for a few taxa only. All former attempts to write a serious comprehensive taxonomic analysis of large groups using the rank-based nomenclature only were not successful; this made me use a more complicated but more powerful nomenclatural system. In contrast to some other nomenclatural systems proposed in the last years, this one does not contradict the International Code of Zoological Nomenclature and allows the more effective use of all names accumulated in zoological literature since 1758. Principles of nomenclature are explained here in the Introduction.