

Tropical Asian Streams

Zoobenthos, Ecology and Conservation



香港大學出版社
HONG KONG UNIVERSITY PRESS

Hong Kong University Press
14/F Hing Wai Centre
7 Tin Wan Praya Road
Aberdeen, Hong Kong

© Hong Kong University Press 1999

ISBN 962 209 469 4

All rights reserved. No portion of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage or retrieval system, without permission in writing from the publisher.

Contents

Preface	xii
1 Introduction	1
2 Scope	7
3 Ecological Overview	13
• Geomorphic Setting	13
Southeast Asia	13
The Indian Subcontinent	15
China	17
The East Indies	20
• Climate	20
• Discharge Regime	24
• Hydrochemistry	31
Composition	31
Spatial and temporal variation	36

• Transported Inorganic Load	39
• Transported Organic Load	42
• Benthic Organic Matter	46
Inputs and standing stocks	46
Decomposition and heterotrophy	48
• Primary Production	50
Phytoplankton	50
Periphyton	51
Macrophytes	53
• Zooplankton	54
• Zoobenthos	55
Composition in large rivers	55
Composition and distinctive elements in small rivers	57
Longitudinal zonation and microdistribution	59
Functional organization and the River Continuum	
Concept	63
Seasonality	70
Life-history patterns and production	72
• Fish	75
Composition	75
Breeding	79
Feeding	82
• Floodplain Ecology	86
Biota and productivity	86
River-floodplain interactions	90
 4 The Zoobenthos: A Systematic Review	93
• Key to Macroinvertebrate Groups	93
• Lower Invertebrates	99
Porifera	99
Cnidaria	100
Turbellaria	102
Nemertea	105
Nematoda	105
Nematomorpha	106
Ectoprocta (Polyzoa)	107
Polychaeta	111
Oligochaeta	112
Hirudinea	118
Branchiobdellida	127

Contents

• Mollusca	129
Prosobranchia	129
Pulmonata	142
Bivalvia	147
• Crustacea	161
Decapoda: Caridea	162
Decapoda: Brachyura	177
Other Malacostraca	186
• Chelicerata	188
Hydrachnida	190
• Introduction to the Aquatic Insects	197
• Ephemeroptera	207
Baetidae	216
Oligoneuriidae	233
Heptageniidae	235
Leptophlebiidae	253
Ephemerellidae	264
Caenidae	275
Ephemeridae	281
Polymitarcyidae	287
Potamanthidae	288
• Odonata	291
Zygoptera	303
Anisoptera	310
• Plecoptera	316
Perlidae	323
Peltoperlidae and Styloperlidae	328
Nemouridae	330
Leuctridae and other Plecoptera	332
• Heteroptera	334
Nepomorpha	338
Gerromorpha	351
• Trichoptera	356
Rhyacophilidae	373
Hydrobiosidae	376
Glossosomatidae	377
Hydroptilidae	381
Philopotamidae	386
Stenopsychidae	389
Psychomyiidae	392
Xiphocentrionidae	395

Polycentropodidae	397
Ecnomidae	400
Dipseudopsidae	403
Hydropsychidae	405
Leptoceridae	421
Lepidostomatidae	425
Calamoceratidae	429
Odontoceridae	433
Helicopsychidae	434
Limnocentropodidae, Phyrganopsychidae, Brachycentridae, Uenoidae, Goeridae, Molannidae and Sericostomatidae	435
Other Integripalpia	442
• Coleoptera	444
Dytiscidae	456
Gyrinidae	460
Noteridae and other Adephaga	462
Hydraenidae	464
Hydrophiliodea	464
Scirtidae	469
Eulichadidae and Ptilodactylidae	471
Psephenidae	472
Elmidae	476
Other Dryopoidea	482
Lampyridae and other Polyphaga	483
• Diptera	484
Nematocera: Tipulidae and Tanyderidae	490
Nematocera: Blephariceridae, Deuterophlebiidae and Nymphomyiidae	494
Nematocera: Simuliidae	495
Nematocera: Ceratopogonidae	498
Nematocera: Chironomidae	499
Other Nematocera	505
Brachycera	507
• Minor Aquatic Insect Orders	509
5 Anthropogenic Threats	519
• River Regulation	521
River regulation in China	522
River regulation elsewhere in tropical Asia	537

Contents

• Drainage-Basin Management	549
Tropical deforestation and river fisheries	555
• Pollution	558
• Extinctions	563
• Prospects	573
6 Experimental Design and Detection of Anthropogenic Impacts in Streams	577
• Choice of Biomonitoring	578
• Confounding Effects of Environmental Variability in Streams	580
Longitudinal variation	580
Small-scale spatial heterogeneity	584
Inter-stream variability	585
Temporal variation in stream communities	587
• BACI and Beyond-BACI Designs	589
• Significance of Confounding Effects	590
Statistical power	591
Statistical errors and the ‘burden of proof’	592
• Recommended Strategies	593
7 Process-Orientated Studies in Stream Ecology	597
• Descriptive Studies that Reveal Patterns	598
• Experimental Studies	602
• Restoration and Mitigation of Environmental Impacts	605
Restoration	605
Mitigation of stream-flow regulation	606
• Integrated Approaches to Stream and Drainage Basin Management	608
• Recommended Strategies	609
8 Concluding Remarks	611
References	617
Subject Index	777
Organism Index	789

1

Introduction

We know surprisingly little about the ecology of tropical freshwaters in general, and tropical Asian rivers and streams in particular. This is despite the dependence of humans, livestock and agriculture upon streams and rivers in a region which is poor in natural lakes. The reliance is increased by the monsoonal climate of much of tropical Asia: rainfall and hence stream-flow patterns are strongly seasonal with marked wet and dry seasons. As a result, the region experiences periods of drought and water scarcity interspersed by times of plenitude when damaging floods may occur. This pattern has spurred attempts to regulate or control the flow of streams and rivers, a practice which has been prevalent for many centuries and has reached an apotheosis in recent schemes to dam the Chang Jiang (Yangtze) and Mekong Rivers. It is not surprising, therefore, that few — if any — rivers in tropical Asia remain in their original state. Ever-more ambitious river-engineering projects, driven by demands from burgeoning populations, are being undertaken to contribute to economic development which (it is hoped) will be fuelled by cheap hydroelectric power. These schemes will increase the magnitude and extent of human impacts on streams and rivers, many of which are already degraded by pollution and modification of their drainage basins by forest clearance, overgrazing,

urbanization and so on. Habitats have become altered in ways which we do not understand or appreciate fully simply because little was known about them before any changes took place. Loss of biodiversity is a matter for particular concern yet, apart from a few charismatic species (river dolphins, and certain fish such as the mahseer), threats of extinction and the concomitant requirement to frame effective conservation measures have received scant attention. There is thus a need to improve understanding of rivers and streams — whether man-modified or not — in order to provide the information required to predict the impacts of planned developments. We must also formulate environmental management practices which will ameliorate or reverse habitat degradation and loss of biodiversity.

A necessary first step is to organize the scattered and often fragmentary information that is already available, so as to make apparent what is known about tropical Asian rivers and what we have yet to find out. That is one of the four main aims of this book. Its importance stems from the fact that the results of much tropical freshwater research are not disseminated adequately because they are communicated in the form of reports or articles in journals with restricted local or regional circulation (Williams, 1988; 1994). Consequently, a great deal of worthwhile work is neglected. Boon (1995) has illustrated this point by analysing the references ($n = 1,356$) cited in a recent publication on the *Inland Waters of Tropical Asia and Australia: Conservation and Management* (Dudgeon & Lam, 1994). Only 30% were from widely-circulated, international journals; most (56%) were from regional journals (22%), reports and theses (25%), or conference proceedings (9%), with the remainder cited from books (14%).

There are at least two ways of approaching the study of nature. One tactic is to investigate a habitat or any circumscribed local environment with the aim of producing an inventory of the organisms found there, preferably with some indication of their relative abundance or population densities. Such data underpin efforts directed towards the conservation of biodiversity. The second approach concentrates upon what the organisms are doing in the habitat, and might involve measuring attributes of groups of animals which have similar interactions or use the same resources — such as predators or the animals which eat algae — but which are not necessarily closely related. In the first case we are asking descriptive questions: 'Which organisms live in the habitat? How many are there?' We label them using a scientific name, but without additional information this does not provide

us with any understanding of what is going on in the habitat. In the second case we ask: 'What are the organisms doing?' — a functional question. The two approaches are complementary, with the descriptive approach often preceding the functional one, but they are nonetheless distinct. The ecological literature exhibits a clear dichotomy between these approaches, and books tend to focus on either one or the other. If the main goal is to introduce the reader to descriptive studies and to assist in their execution, an identification manual (with keys and line drawings) would be the usual publication. If the functional approach is adopted, an introduction to ecological patterns and the processes bringing them about would be the subject of the text. In this book, a combination of both approaches is taken. Firstly, the features of tropical Asian running waters are addressed by adopting a functional approach to review their physical and chemical features, transport processes, the importance and fate of allochthonous and autochthonous organic matter, land-water interactions (particularly on floodplains), and the interactions between major groups of primary producers, consumers and decomposers. It is probably impossible for any individual to do justice to all aspects of stream ecology in a review, and my familiarity with smaller rivers and streams and benthic ecology may have led to an overemphasis on certain topics. Likewise, considerable space has been given to examples from Hong Kong where I have spent most of my research career. That said, I have attempted to review adequately all of the available literature and — given the lacunae in our knowledge of certain important processes (e.g. nutrient spiralling) and elements of the biota in Asian streams (e.g. the biofilm, the hyporheic fauna) — a fully-comprehensive treatment of stream ecology in the region is still some way off.

The functional approach used for the review which constitutes the first part of this book then gives way to a systematic review of the benthic macroinvertebrates, or zoobenthos, of tropical Asian streams and rivers. These are typically the most diverse fauna of running-water habitats, and are used widely as biomonitoring of environmental change in Australia, North America and Europe. The intention here is to provide information about — and keys to — the major taxa so as to facilitate their identification and quantification in streams and rivers throughout tropical Asia. The examples illustrated in this section are mostly Hong Kong species, but the keys and supporting biological data were written to be applicable beyond the territory. It is hoped that they will provide a basis for ecological studies or will underpin the use of the zoobenthos as biomonitoring of water quality and habitat

conditions. Thus the second goal of this book is to serve as a tool to further the descriptive study of zoobenthos in tropical Asian streams and rivers.

The third objective of the book is to review the anthropogenic threats to streams and rivers in the region. Such threats are all-pervasive, and thus such a review cannot be exhaustive. Particular attention has been paid to case studies, including the Mekong River and streams in southern China. This review is followed by an account of sampling techniques and a description of experimental designs and sampling strategies needed for the detection of human impacts and environmental change in streams. This section is included because of the urgent need for well-designed, unambiguous studies of human impacts on streams in Asia. Resources for environmental monitoring and protection efforts are always limited; it therefore behoves us to undertake well-designed studies that test hypotheses about impacts (or, indeed, any ecological process) in a clear, parsimonious, objective and unambiguous fashion. Statistical analysis of the magnitude of putative impacts are also facilitated by good experimental design. The fourth goal of this book is therefore to alert researchers to some sampling strategies and experimental designs which will improve their ability to separate the effects of changes caused by human impacts from those resulting from natural spatial or temporal variations in streams. Application of these designs should improve our ability to detect impacts, and reduce the chances of declaring that a change is due to anthropogenic influences when in fact it has not. Suggestions are also made as to the types of process-orientated ecological studies which are needed to inform the efforts of those charged with managing, restoring or mitigating impacts upon rivers and streams.

The four objectives of this book are complementary and, it is hoped, will provide useful information and some of the methodological tools needed by researchers in the region. Much good science in Asia has been undertaken by individuals and small teams working on limited budgets under less-than-ideal conditions. While funding constraints are unlikely to disappear at any time in the near future, a shortage of books and journals, restricted library budgets and time limitations prevent many scientists from keeping abreast of the literature dealing with the systematics of the organisms they study, the ecology of the habitats where they are found, and the methodological approaches best suited to their investigation. This book was written to provide such information.

In summary, the four goals of this book are:

1. To review the ecology of Asian rivers and streams, adopting a functional approach to describe the interactions between physico-chemical factors, transport processes, the origins and fate of organic matter, and major elements of the stream biota. An additional objective is to provide a compendium or guide to the relevant but widely-scattered ecological literature.
2. To provide a systematic account of the composition of the zoobenthos to facilitate their identification and further study;
3. To give an account of the major human impacts upon tropical Asian streams and rivers.
4. To suggest appropriate research strategies for assessing environmental impacts and undertaking process-orientated investigations of stream ecology.

Throughout this book, the terms 'river' and 'stream' are used interchangeably, with 'stream' being the preferred generic label for running waters. Where one term is used in preference to the other in describing a particular water course, it should be understood that a stream is simply a small river.

2

Scope

In 1984, the Brazilian limnologist J.G. Tundisi wrote of the general perception that our knowledge of tropical freshwaters was far less than was required to understand the mechanisms and processes operating in these ecosystems (Tundisi, 1984). It is certainly less than is desirable and needed for their proper conservation and management (Williams, 1988; 1994). A perennial obstacle to tropical research, Tundisi asserted, was difficulty in obtaining even the basic literature. He exhorted colleagues to disseminate information in the form of reviews and critical syntheses on a regional basis. Such regional syntheses could deal with systematics, biological processes, and ecosystem functioning drawing upon the limited examples available. In that spirit, this book was written.

The freshwater ecology of tropical Asia is not well known (Fernando, 1984a; Dudgeon & Lam, 1994; Boon, 1995; Dudgeon, 1995a), despite Dussart's (1974) review of the pre-1970 literature concerning to inland waters of the region. Lotic habitats (i.e. rivers and streams) have received less attention than standing waters (Crisman & Streever, 1995), notwithstanding the fact that an Asian biologist (Hora, 1923, 1927, 1936) was among the earliest investigators of the stream fauna. For example, Lim (1980) has drawn attention to the

paucity of information on Malaysian freshwaters, while Radhakrishna (1984) described the study of the inland waters of the Indian subcontinent as ‘... a virgin field ...’, stating that ‘... the basic knowledge concerning the systematics and ecology of various groups of aquatic animals is still unsatisfactory’. An exception to this generalization is Sri Lanka where the freshwater fauna is better known systematically than that of other tropical countries (Mendis & Fernando, 1962; Fernando, 1984b; 1990). Here too, however, new fish species are still being discovered (Pethiyagoda, 1994) and studies of the ecology of streams and rivers of the island are not well advanced.

Information on the ecology of tropical Asian rivers and streams is fragmentary, and there have been few attempts to gather data about entire communities within particular habitats or to investigate temporal changes over seasonal and annual cycles (but see Bishop, 1973; Furtado & Mori, 1982; Dudgeon, 1992a). Even basic information — such as the longitudinal zonation of fauna — has yet to be gathered for the major rivers of the region. Tropical Asian rivers are made up of a variety of habitats and are host to a diverse array of organisms but, at present, we have no complete studies of any tropical Asian river system of any size. What variety of organisms occur in which habitat type is known in a few cases only, and we have yet to measure how much each habitat contributes to the productivity of the river as a whole. The picture is complicated by the fact that certain fishes and shrimps use various habitats at different times, and some of these habitats are inundated for part of the year only. Further complexity is introduced by year-to-year variations in rainfall which alter the extent and duration of floodplain inundation, and the magnitude of land-water interactions. Furthermore, much of the available data have been generated from studies which were initiated after habitats had become polluted, and were concerned more with documenting the extent of local species loss or environmental degradation than with the composition or functional relationships of the lotic biota. This reflects, in part, a paucity of support for basic ecological research, but is probably due also to the lack of an overall conceptual structure that might serve as a theoretical underpinning for studies of river and stream ecosystems. The importance of this point can be understood by considering the development of lotic ecology.

The first, widely-available, English-language text dealing with lotic ecology was Noel Hynes’ encyclopedic *The Ecology of Running Waters* published in 1970 (Hynes, 1970). A wide range of information from an extensive array of sources was synthesized in that volume, providing

Scope

a well-integrated overview of the field. Hynes' work contributed a firm foundation of knowledge and thereby facilitated the development of innovative research strategies that would further our understanding of lotic habitats. Later investigations gave rise to an appreciation that rivers and streams are the focus of catchment processes, subject to the behaviour of elements within the drainage basin (Hynes, 1975; Vannote *et al.*, 1980; Davies & Walker, 1986). Fish and other animals can range widely throughout the aquatic system exploiting different resources, or may use the same resource at different times or places. It therefore became evident that the appropriate focus for understanding and managing rivers and streams was the drainage basin as a whole rather than the aquatic environment (or segments of it) in isolation. This focus was made explicit in the River Continuum Concept (Vannote *et al.*, 1980; Minshall *et al.*, 1983, 1985) which has stimulated research by stream biologists in North America, Europe, Australia and New Zealand during the last 15 years, and provided a unifying structure against which ideas could be generated and hypotheses tested (e.g. Cushing *et al.*, 1995). Conceptual advances such as this have initiated the transformation of freshwater science from a primarily descriptive discipline to one which has a predictive component that can be brought to bear in formulating strategies for basic and applied research including river conservation and management. Of particular relevance in this book will be the use of the River Continuum Concept (RCC) to provide an underlying structure for a review of our knowledge of streams and rivers in tropical Asia. My main objectives will be to summarize what is known about these lotic habitats, and to show where data are lacking. An additional aim will be to determine whether and how tropical Asian streams and rivers differ from their counterparts elsewhere.

The geographical scope of this book is tropical Asia, a region which lacks discrete physical boundaries but can be defined approximately as those areas experiencing a monsoonal climate and possessing a fauna belonging chiefly to the Oriental Region. The area encompassed extends from west of the Indus River eastward along the Himalaya Mountains to the China Sea at the mouth of the Chang Jiang (Yangtze River), and eastward in the Indies into Wallacea to include Sulawesi (the Celebes) and New Guinea (Fig. 2.1). The incorporation of China south of the Chang Jiang in the Oriental Region follows Banarescu (1972), and concords with demarcation line between the Palaearctic and Oriental mammal fauna of eastern China (Huang, 1985). Coincidentally, this division is consistent with the observation

Scope

that two rice crops each year are possible south of the Chang Jiang, but only one north of it (Yang & Morse, 1987). Studies on the biogeography of Chinese fishes (Li, 1981) and Asian caddisflies (Schmid, 1966; Dudgeon, 1987a; Yang & Morse, 1988) confirm that the northern boundary (around 30°N) represents a transition zone for the freshwater fauna. The inclusion of New Guinea is justified on the basis that the great majority of the island's fauna (especially insects) is of Oriental derivation (Gressitt, 1982). For example, the freshwater palaemonid and atyid shrimps of New Guinea include mainly species with a wide geographical distribution, the island forming the eastern — not western — limits of their range (Holthuis, 1982).

8

Concluding Remarks

Even if the research strategies advocated in Chapters 6 and 7 of this book were taken up by biologists, stream conservation will be possible only when they are combined with a move beyond the bailiwick of science into the political arena. If they are to succeed, ecologically-viable management strategies for tropical Asian streams must take account of socioeconomic contexts; in particular, the pressure of increasing human populations and the desire for economic growth which drive development and urbanization. While the 1997 depression of Asian economies may slow growth temporarily, it will do nothing to lessen the forces driving such growth. Socioeconomic advancement in many tropical countries must proceed as a way of reducing poverty, disease and deprivation, and the '... fact that the safeguarding of biodiversity is a desirable goal for the whole world is meaningless to the tens of millions who live on the edge of starvation...' (Zuckerman, 1992) is inescapable. Unfortunately, development almost inevitably brings in its train new environmental problems. There is thus every likelihood that ecosystems will continue to be degraded and biodiversity will decline until such a time that they can be assigned an economic value and factored into the costs of developments (Dudgeon *et al.*, 1994). This means that the 'indirect use value' of environmental

functions provided by stream ecosystems needs to be estimated (Aylward & Barbier, 1992; Dugan, 1994b); i.e. some economic value must be put on streams. A stress can be placed upon high-value functions such as fisheries support, since river fisheries provide the principal source of animal protein for many rural societies (Dugan, 1994b).

Putting an economic value on the biota and its functions will not, on its own, prevent further degradation of tropical Asian stream ecosystems. Neither will publication of more and better research, or a more frequent adoption of experimental approaches to stream ecology. Inevitably, scientists will have to address political issues in order to influence policy-makers and the populace at large. If we are to be effective in this regard, we must ensure that the scientific data and predictions about ecological change and environmental impacts are rigorous. If we lack understanding of the processes and mechanisms underlying observed patterns or changes in streams, or if we use inadequate designs to test for environmental impacts, then compelling and rigorous scientific assessments or predictions are not possible, and disputes are promoted. Any uncertainty arising from poor design or inadequate functional understanding means that reasonable arguments can be made for and against the incidence of a 'real' effect because of the lack of unequivocal evidence. Ecologists and conservationists cannot be effective in the political arena unless they have at hand rigorous and unbiased data — based upon appropriate monitoring designs and research strategies — which can be analysed unequivocally thereby avoiding disputes among interested parties. If we fail to rise to this challenge, then we will witness a dilution of the scientific input into public debates that incorporate the wider socioeconomic or political issues relating to stream conservation and management.

To be effective advocates of stream ecosystems, we must enhance (and maintain) the rigour of our research strategies. Decision-makers in government and state organizations must be informed of our findings and made aware of a number of key facts (after Williams, 1994):

1. That stream ecosystems (indeed, all inland waters) are of considerable economic, cultural, aesthetic, educational and scientific value.
2. Water resources can be (and are being) significantly degraded in value, sometimes irreparably so.
3. The conservation and management of stream ecosystems both for present and future generations is manifestly in the interests of the government or state.
4. Effective conservation and management of stream ecosystems is

possible only when based upon a thorough scientific knowledge of them.

To conclude, we must assess impacts and undertake ecological process-orientated studies in as rigorous a manner as is possible. Obviously, better management of ecological resources will occur if there is an improved understanding of the organization and function of aquatic systems — especially if ‘ecological health’ can be invoked as a goal of environmental management (Courtemanch, 1994). In this regard it is important that we address the nature of the link between aquatic biodiversity and ecosystem functioning. The existence of such a link is implicit in the RCC, yet we do not know the form of the relationship between these two variables, nor do we know how much biodiversity (if any) can be lost before ecosystem functioning is impaired. Perhaps there is much redundancy in functional roles among different taxa so that replacement of one by another is possible. If so, it might be argued that species- or generic-level identification of (say) benthic invertebrates is irrelevant in many instances. If, however, ecosystem functioning and biodiversity are inextricably linked, then our options and approaches to environmental management must take full account of this fact. We do not know which of these possibilities matches reality more closely and, while wise counsel dictates that we assume that all components of biodiversity have functional significance, in the longer term we must determine whether this is, in fact, the case. The relationship between biodiversity and ecological function is fundamental, and one which we should understand sufficiently well to allow prediction of the wider consequences of species loss. Decision-makers and the public are certain to expect us to be able to accomplish this much.

Our knowledge of the ecology of tropical Asian streams is nowhere near as complete as we would like, but stream biologists will nevertheless be asked for their professional judgement about possible environmental impacts on habitats, and ways by which impacts might be mitigated. Clearly, we will have to give advice in situations where data are ambiguous, or even lacking, because a delay in offering an opinion could lead to irreversible changes in ecosystems. It is, for example, most unlikely that industrial development or civil-engineering projects along the banks of tropical Asian rivers will cease until scientists have at hand all of the data they need to render an informed opinion about the consequences of a proposed development. Moreover, this assumes that research funding to obtain such information will become

available; past experience gives us little confidence that funding will ever be anything but extremely limited. Pollution and river regulation are often irreversible processes and a delay in proffering advice may mean that streams are degraded beyond their capacity to recover. It thus behooves us to provide scientific advice whenever and wherever possible, notwithstanding the uncertainty with which we make our judgements. The information provided should be appropriately focused, achieving a balance between the ideal and the achievable, recognizing the functioning of river basins and not merely river channels (Boon, 1992). Clearly, it will be helpful if the input is unequivocal, authoritative and simple (but not simplistic). A pragmatic approach is essential (and has been advocated to marine biologists by Warwick, 1993), although we must be mindful of the words of Slobodkin (1988) that '... it is by no means obvious that crudely imperfect advice is more valuable than none at all'. We should, of course, maintain the highest levels of scientific rigor and objectivity, but a refusal to participate in public debate and decision-making processes because we lack some of the data will do nothing to prevent the on-going despoliation of streams and rivers throughout tropical Asia.

Notwithstanding the need for more research, decisions taken by legislators and politicians concerning tropical Asian rivers will have a greater impact on the future of these ecosystems than any amount of ecological work. The biological solutions to many environmental problems are within reach, given the political will and suitable legislation. To quote McNeely (1987): '... environmentalists often behave as if the progression from knowledge to action should somehow be automatic, but experience has taught the hard lesson that conduct of governments is not directly guided by ecological science, or even objective logic ...'. Moreover, ecologically-viable management strategies will fail if they do not address socioeconomic and cultural contexts, or are considered in isolation from the aspirations of the local populace. The implications are clear: we must continue to contribute to the academic development of stream biology, but make greater efforts to disseminate our knowledge of river ecosystems and communicate with those planning large-scale developments as well as those whose activities have a direct effect on the ecosystems at issue. As Caldwell (1985) puts it: '... what is needed, but is not present, is a popular movement, fundamentally political, to translate the 'oughts' and 'shoulds' of environmental findings and declarations into workable and widely acceptable programmes of action ...'. Development of effective dialogue which will influence or affect politicians will not be easy and

may divert efforts away from research. Nevertheless, further habitat degradation and loss of biodiversity will result from a failure to engage in wide-ranging discourse. We must now weigh our priorities. Should we increase output of learned papers, while ignoring the *realpolitik* of conservation and management in tropical Asia? Or, should we devote more effort to communicating the relevance and importance of our science, even if this means we spend less time publishing research papers? It may be argued that this choice is a false dichotomy, but I believe that a more focused approach to our science is required. It is no longer appropriate (if, indeed, it ever was) to devote ourselves *solely* to spawning manuscripts which begin with statements like 'Not much is known about the biology of . . .'. There must be a greater attempt to generate ideas, hypotheses or theories which will have direct application to stream conservation and management. Perhaps this change will come about only when we recognize many of the engineering projects along Asian rivers for what they are: giant, unreplicated, experiments in environmental management. They should be treated as such, and studied so that we can learn from them how to better understand and ameliorate their environmental effects. This approach may provide our best chance of preserving many stream ecosystems into the next century and beyond.

Subject Index

To facilitate use of this book, the index includes brief definitions of terms which may be unfamiliar to the general reader. Entries relating to invertebrate anatomy indicate places in the text where body parts are figured or structures are described.

- Abdominal markings (of larval Baetidae) 223
Acidity (see also pH) 85
Air movements (see also Monsoons) 22
Alkalinity 36, 38, 130, 163
Aluminium 37
Antennal spine (of Decapoda) 164
Apotome (of Hydropsychidae) 368
Appendix interna (of Decapoda) 164
Appraisal optimism 544, 545
Aptery 317, 333, 335
of Heteroptera 342, 343, 350, 351, 353, 355
Aquaculture (see also Artificial propagation) 17, 78, 528, 531, 545, 565, 573
Aquarium trade 146, 566
Artificial propagation (see also Aquaculture; *ex situ* conservation) 530, 531
Artificial (and/or introduced) substrates 71, 585, 594
BACI designs 589–590, 593, 594
Bangladesh National Flood Action Plan 539, 554, 568
Barrages 81, 538, 541, 564, 569
Farakka Barrage 538
Basis (of Decapoda) 164
Bedload transport 39, 40
Benthic organic matter (see also Detritus) 46–49
Bicarbonate 32, 34, 35, 36, 130

- Biodiversity 2, 75, 180, 540, 545, 555, 556, 557, 563, 564, 566, 573, 577, 598, 609, 611, 613, 615
Bioindicators (see also Biomonitoring; Environmental impact assessment) 174, 194, 562
'Biologically dead' 560
Biomass 47, 49, 50, 52, 55, 57, 66, 68, 73, 74, 85, 87, 88, 91, 156, 172, 295, 485, 551, 579
Biomonitoring (see also Bio-indicators; Environmental impact assessment) 3, 364, 562, 578, 579, 597, 602, 604
Bivalves as egg repositories for fish 156
Bivalves as hosts for Hirudinea, Hydrachnida, etc. 126, 156, 190, 209, 233
Blackwaters 32, 38, 89, 91, 563, 564, 566
Branchiostegal spine (of Decapoda) 164
Branchiostegal suture (of Decapoda) 164
Brood chamber (of Bivalvia) 149, 155, 159, 160
Brood pouch (of Gastropoda) 130, 133, 135, 141
Bubble-nest building 80, 88
Buffer strips (see also Riparian forest) 601
Burrowing behaviour (of Ephemeroidea) 286, 287
Byssus (of Bivalvia) 153, 154, 161
Calcium 32, 34, 35, 36, 38, 130, 489, 508
Carpus (of Decapoda) 164
Case-building habits (of caddisflies) 363, 429
Cavernicolous (see Hypogean)
Cephalic fans (= labral fans of Simuliidae) 495, 496
Cervical gills (of Plecoptera) 319
Check dams 551
Chelipeds (= chelate peraeopods of Decapoda) 162
China (geomorphic setting) 17–20
CITES 565
Climate (of tropical Asia) 20–24
Clypeus (of insects) 450
Collector-gatherer functional-feeding group 64, 65, 66, 67, 68, 254, 275, 350, 364, 495, 499
Collectors (see Collector-gatherer and Filter-feeder functional-feeding groups) 128, 156, 201, 209, 501
Commensals 128, 156, 201, 209, 501
Competition 84, 85, 131, 517, 603, 604, 609
Container habitats 469, 507
Conservation 2, 7, 9, 61, 89, 521, 529, 530, 539, 541, 549, 555, 563–573, 577, 578, 580, 591, 592, 598, 599, 602, 608, 609, 611–615
Coprophagy 495
Courtship behaviour (see Mating behaviour)
Coxa (of insect legs) 203
CPOM (= coarse particulate organic matter; see also Detritus) 45, 46, 67
Ctenidia (of Bivalvia) 148
Dactyl (of Decapoda) 164
Dams (see also Barrages; Reservoirs) 62, 81, 409, 521–549, 551, 553, 564, 568, 569, 571, Bakun 540
Chang Jiang Low Dam 525, 526, 530, 531
Chenderoh 563
Chisapani Gorge 553
Danjiangkou 531
Gezhouba (see Chang Jiang Low Dam)
Kratie 543
Lam Dom Noi 543

- Mangla 41, 554
Manwan 542
Nam Ngum 56, 542, 545, 544, 546
Nam Pong 543, 547
Nam Theun 543, 544, 545
Pa Mong 541, 543
Pak Mun 546
Prek Thonot 543
Sardar Sarovar 538
Srepok 543
Stung Battambang 543
Stung Treng 543
Tarbela 41, 554
Tehri 553
Xeset 544
Yali Falls 545
Damaging fishing practices 557
Defensive compounds (secreted by aquatic Coleoptera) 456
Deforestation (see also Forest cover; Logging) 1, 30, 35, 40, 519, 528, 545, 549–552, 555–558, 564, 571
Deposit-feeders 64, 65, 112
Descriptive studies of stream ecology 598–602
Detritus 42–44, 46–49, 66, 68–70, 87–89, 128, 131, 160, 209, 235, 265, 286, 289, 311, 316, 323, 328, 331, 346, 372, 390, 392, 395, 400, 405, 421, 430, 437, 441, 468, 470, 471, 477, 491, 501, 508, 512, 551, 600, 603
Dietary composition
 of fishes 82–86
 of Hydropsychidae 405, 421
 of Odonata 70, 298
 of Plecoptera 323, 331
Direct development (of larvae) 58, 59, 111, 174, 175, 179–181
Discharge regime 15–18, 23, 24–31, 33–37, 39, 40, 42, 43, 45, 46, 50, 53, 71, 430, 527, 532–534, 538, 539, 541, 553, 554, 559, 606
Disease (see also Parasites) 497, 537
Dispersal 198, 296, 445, 608
Disturbance (see also Flood flows; Spates) 71, 556, 583, 603–605, 610
‘press’ disturbance 583
‘pulse’ disturbance 583
DOM (= dissolved organic matter) 44, 543
Drainage basin management 549–558, 608–610
Drift (of stream animals) 71, 75
Drumming behaviour (of Plecoptera) 316

East Indies (geomorphic setting) 20
Ecdysis (of insects) 199
Economic and Social Commission for Asia and the Pacific 541
Economic valuation (of the environment) 611, 612
Ectoparasites (see also Parasites) 119, 126, 127, 128, 149, 152, 190, 495, 498, 501
Ectosymbiosis (= living on the bodies of other animals; see also Phoresy) 128, 323, 501
Egg repositories (for fish) 156
Electrocution (fishing by electricity) 557
Electrophoretic studies (of Ephemeroptera) 237, 243
Elytra (of Coleoptera) 448
Endopodite (of Decapoda) 164
Environmental impact assessment 540, 545, 577–595
Environmental variability (see Variability)
Erosion (see also Siltation; Sedimentation) 16, 18, 40, 519, 549–554, 571, 601
Ex situ conservation 530, 566, 568
Exopodite (of Decapoda) 164
Exotic species (see Introduced species)
Experimental design in stream ecology 577–595, 602–605

- Experimental management 604
Explosives (use for fishing) 557
Extinctions 2, 81, 155, 528, 532, 546, 547, 563–572, 608
- Feeding behaviour (see also Dietary composition; Filter-feeding)
of Heteroptera 335
of fish 82–86
- Femur (of insect legs) 203
- Filter-feeders and filter feeding 64–68, 112, 235, 289, 364, 382, 405, 495, 501
- Fisheries 78, 81, 83, 89, 91, 172, 519, 527, 533, 534, 539, 540, 542, 545, 546, 555–558, 563–567, 574, 612
- Fish breeding (see also Migration by fishes) 77, 79–82, 83, 91, 529–530, 537, 546–547, 558, 565–566, 599
- Fish community composition 75–79
- Fish feeding 82–86
- Fish hosts (of glochidia larvae) 149, 155
- Fish kills 533, 557, 559, 560, 564
- Fish ladders, fish passes and fishways 530, 531, 533, 539, 547
- Floating islands 53
- Flood Action Plan (see Bangladesh National Flood Action Plan)
- Flood control (see also Stream-flow regulation) 18, 91, 521, 524, 525, 532, 539, 554, 571, 606
- Flood flows (see also Spates) 14, 15, 17, 18, 24, 26, 27, 30, 31, 34, 35, 39, 40, 42, 43, 72, 78, 81, 82, 86, 87, 88, 90, 91, 521, 524, 525, 532, 536, 539, 549–551, 554, 568, 571, 606
- Floodplains (see also Wetlands) 8, 16, 18, 20, 35, 37, 42–44, 50, 53, 54, 56, 72, 79, 80, 82, 85, 86–91, 100, 115, 135, 149, 457, 525, 529, 537, 539, 540, 547, 549–551, 554, 564, 568, 570–573, 574, 580, 599, 601, 607
- Flow regulation (see Stream-flow regulation)
- Fore-trochanter (of Trichoptera) 367
- Forest cover (see also Deforestation; Logging; Reforestation) 549–551, 554, 555
- Forest fires 89
- Fouling of water-supply lines 107, 154
- FPOM (fine particulate organic matter) 44, 45, 67
- Frontal processes (of Ephemeroidea) 281
- Frontoclypeus (of Hydropsychidae) 416
- Fruit consumption by fish 80
- Functional-feeding groups 65–67, 209, 378, 492, 493
- Galea-lacinia (of insect maxillae) 202
- Gallery forest (see Riparian forest)
- GEMS (Global Environmental Monitoring Scheme) 558, 559
- Generalist functional-feeding group 64, 65
- Gill tufts (of insect larvae) 203
- Global warming 564
- Glochidium larva (of Unionidae) 149, 150, 152, 155, 156
- Glossae (of insect labium) 317
- Gonopods (of freshwater crabs) 180
- Grand Canal (China) 17, 522, 524, 535
- Greenhouse effect 564
- Habitat specialization (see also Microdistribution)
of aquatic insects 70
of Odonata 298
of fishes 83–84

- of freshwater crabs 181
of Hydropsychidae 420–421
- Habitat restoration 572, 573, 605, 606
- Hemelytra (of Heteroptera) 335
- Hepatic spine (of Decapoda) 164
- Hermaphroditism 80, 138, 142, 149, 151, 177
- Heterogeneity (see also Variability) 41, 62, 63, 71, 584, 594
- Heterotrophic community metabolism 48–49
- Hora, Sunder Lal 55
- Hydranth (of freshwater Cnidaria) 101
- Hydrochemistry 31–39
- Hydrofuge hairs (of aquatic insects) 200
- Hydrographs (see also Discharge regime) 25
- Hygroscopic animals (living on wet rock surfaces) 352
- Hydropower generation (see also Dams) 521–549
- Hynes, H.B. Noel 8
- Hypogean animals (living in underground water; see also Hyporheic fauna) 103, 167, 171, 177, 179, 185, 186, 187
- Hypopharyngeal teeth (of Scirtidae) 470
- Hypopharynx (of insect mouthparts) 202
- Hyporheic fauna (living in saturated sediments beneath streams; see also Hypogean animals) 3, 56, 71, 161, 190, 197, 316, 333
- Hypostomium (of Simuliidae) 496
- IFIM (In-stream Flow Incremental Methodology; see Stream-flow regulation) 606, 607
- Imago (of insects) 199
- Incisor area (of insect mandibles) 202
- Indian Subcontinent (geomorphic setting) 15–17
- Indirect use value (in economic valuation) 611, 612
- Inter-basin transfers (of water; see also Water-transfer schemes) 523, 524, 534–537, 538
- Intermediate hosts and vectors (of parasites; see also Parasites) 18, 130, 143, 146, 178, 349, 537
- Intersegmental fold (of Hydropsychidae) 416
- Introduced species 63, 77, 78, 100, 135, 136, 140, 145, 146, 152, 154, 155, 162, 172, 178, 350, 517, 571, 572, 573, 574
- Introduced substrates (see Artificial substrates)
- Ionic composition (of stream water; see also Nutrients) 31–36
- Ionic composition, spatial and temporal variations 36–39
- Iron 37
- Irrigation 136, 521–523, 525, 530, 532, 535, 537–538, 540, 541, 544, 547–548, 550, 553–554, 564
- Ischium (of Decapoda) 164
- King Mahasena (of ancient Sri Lanka) 540
- Labium (of insect mouthparts) 202, 204
- Labrum (of insect mouthparts) 202, 204
- Lakes
- Chenhu 87
 - Dongting 10, 18, 520, 526, 528, 529, 530, 550
 - Le Grand Lac 14, 15, 79, 88, 541, 549
 - Mainit 136
 - Murray 15
 - Poyang 10, 18, 87, 520, 526, 528, 529

- Sidenreng 89
Tasek Bera (Swamp) 89
Tempe 89
Larval development (see Direct development)
Leaf litter (see also Detritus) 43, 46, 48, 64, 66–68, 172, 181, 265, 309, 405, 430, 471, 509, 582
Leaf-mining (by Chironomidae) 501
Legislation (for environmental protection and pollution control) 534, 560, 561, 577, 614
Life cycles and life histories 199
of Bivalvia 149–152
of Coleoptera 445, 458–459, 461, 466, 474, 477
of Decapoda 174–177, 178, 179, 180, 181
of Diptera 490, 495, 497, 499, 500–501, 502, 507
of Ephemeroptera 238, 253, 286, 289
of Ectoprocta 109
of fishes (see Fish breeding)
of Gastropoda 130, 134, 135, 138, 139, 140–141, 142–143
of Hirudinea 118
of Hydrachnida 190, 193
of Lepidoptera 517
of Megaloptera 513
of Odonata 295–298, 303
of Plecoptera 317, 318
of Porifera 99
of Trichoptera 363, 379, 381, 391–392, 419–420, 424, 429, 430
of zoobenthos 72–75, 589
Lithology 31, 32, 34, 35, 37
Logging (see also Deforestation) 61, 552, 556, 557, 569
Long-distance water transfers 534–537
Longitudinal changes and zonation in fish communities 83–84
of Decapoda 60, 174
of Heteroptera 354
of riverine birds 570
of zoobenthos 8, 59–63
Luminescence (of insects) 483
Macrophytes 53, 54, 66, 86, 87, 88, 517
Madicolous (see Hygropetric) Magnesium 32, 34–36, 38
Mahathir Mohamad, Dr 540
Malicky, Hans 381
Management (see Drainage-basin management)
Mandibles (of insect mouthparts) 202, 204
Mandibular tusks (of Ephemeroidea) 281
Mangroves 166, 177, 355
Mao Zedong 534
Marsupium (see Brood chamber)
Mating and courtship behaviour
of aquatic Coleoptera 458
of Ephemeroptera 208, 275
of Heteroptera 336
of Lampyridae 484
of *Macrobrachium* 176
of Odonata 296
of Plecoptera 316
of Trichoptera 363
Mating and egg brooding behaviour
of Belostomatidae 349
Mating swarms
of Ephemeroptera 208
Maxillae (of insect mouthparts) 202, 204
Mekong Committee (serviced by the Mekong Secretariat) 541, 542, 545, 546, 548
Mekong Secretariat (see also Mekong Committee) 541, 542, 547, 548, 608
Merus (of Decapoda) 164, 165, 183
Mesh-size (of filtering nets spun by Trichoptera) 70, 405

- Mesopleuron (of Xiphocentronidae) 368, 396
Mesothorax (of insects) 203
Metathorax (of insects) 203
Microdistribution (see also Habitat specialization)
 of Hydropsychidae 419, 420–421
 of Psephenidae 474
 of zoobenthos 71–72
Migration
 by Decapoda 60, 174–175, 176, 179
 by fishes 77, 79–82, 83, 85, 530–531, 533–534 537, 542, 544–547, 549, 558, 563–565, 599
 by Odonata 297–298
Migratory Species Convention 565
Mitigation of environmental impacts 606–610
Molar area (of insect mandibles) 202
Monoecious (see also Hermaphroditism) 142
Monsoons (see also Rainfall) 17, 18, 21, 22, 24, 27–29, 31, 36, 39–41, 43, 44, 51, 54, 55, 59, 70–72, 81, 82, 85, 99, 109, 151, 152, 174, 175, 180, 297, 298, 409, 459, 461, 534, 539, 551, 552, 554
Mouthbrooding 80
Mouthparts (of insects) 202, 204
Multiplate samplers 585
Muscle scars (of Bivalvia) 148

Narmada Valley Development Project 538
National Commission of Floods (India) 554
National People's Congress (China) 524, 528
National Water Development Agency (India) 538
Needham, Joseph 523
Neustic animals (living on the water surface) 59, 188, 197, 198, 334, 338, 351, 453, 460, 492, 509
Nitrogen (and nitrates) 32–37, 43, 86, 200
Nordic influences (on dam building in Asia) 544, 545
Nuchal plate or scute (of *Helobdella*) 121, 122
Nutrients (in stream water; see also Ionic composition) 32, 33, 36, 37, 51, 52, 53, 54, 86, 90, 130, 143, 537, 578, 581, 602
Nutrient spiralling 3, 602

Ocelli (of insects) 202
Organic load (of unpolluted streams) 42–46
Organic matter inputs 46–48
Oviparous (or oviparity = 'egg laying') 133, 134, 136, 138, 139, 140, 141, 142
Ovoviparous (or ovovipary = 'live-bearing') 130, 133, 134, 135, 138, 140, 141, 149, 154, 159, 160

P:B (= production: biomass; see also Secondary production) 73, 74
P/R (= primary production/ community respiration) 49, 66, 67
Paraglossae (of labium in insects) 317
Parasites (see also Intermediate hosts) 106, 107, 119, 126, 127, 128, 130, 143, 149, 152, 156, 178, 190, 194, 349, 364, 381, 495, 498, 501, 512, 537, 547, 571
Parasitoids 518
Parthenogenetic species (producing young from unfertilized eggs) 129, 131, 140, 141, 275
Peat swamp (see also Swamp) 89, 563

- Peraeopods (of Decapoda) 162, 164
Periphyton 47, 49, 51–53, 64, 67, 89, 90, 131, 138, 143, 474, 477
pH (see also Acidity; Alkalinity) 32, 34, 36–38, 88, 130, 174
PHABSIM (see Stream-flow regulation) 606, 607
Phoresy (see also Ectosymbiosis) 501, 503
Phosphates (and phosphorus) 32, 33, 34, 35, 36, 38, 52, 86
Photosynthesis (see also Primary production) 42, 43, 49, 537
Phytoplankton 43, 50–52, 55, 67, 70, 87, 90, 91, 533
Planktonic larval stages (suppressed; see Direct development)
Plantation agriculture 551, 557
Plastron (a physical gill for insect respiration) 200, 339–341, 345, 350, 448, 449, 477, 518
Pneumostome (of pulmonate gastropods) 142
Poisons (use in fishing) 557
Pollution 2, 48, 54, 60, 61–62, 64, 66, 81, 107, 112, 143, 220, 223, 225, 275, 502, 519–521, 527, 532–534, 556, 557, 558–563, 564–565, 567, 568, 574, 578, 580, 614
Polymorphism (see also Sexual dimorphism)
 of Gastropoda 134
 of Heteroptera 335, 351
 of Odonata 296
Postgenal cleft (of Simuliidae) 496
Potassium 31, 35, 36, 194
Power analysis (see also Statistical power) 595
Precipitation (see Rainfall)
Predators (and the predator functional-feeding group) 2, 64–69, 70, 71, 100, 112, 126, 127, 142, 156, 188, 190, 201, 208, 209, 216, 298, 316, 334, 346, 348, 364, 373, 377, 379, 381, 392, 437, 442, 458, 461, 484, 499, 501, 507, 509, 512, 603
Primary production (see also Photosynthesis) 49, 50–54, 66, 85, 87, 90–91
Prolegs (of insect larvae) 204
Propodus (of Decapoda) 164
Prostheca (of insect mandibles) 202
Protandrous hermaphrodites (change sex from male to female) 118, 129, 138, 177
Protection forests 551
Prothorax (of insects) 203
Protogynous hermaphrodites (change sex from female to male) 80
Pseudoreplication 581–583, 584, 586–587, 593
Rainfall (see also Monsoons) 8, 15, 16, 17, 20, 21, 23, 24, 26–31, 34, 36, 37, 39, 40, 41, 43, 48, 54, 72, 84, 86, 419, 522, 523, 532, 548, 551, 552, 561, 564, 580, 607
Ramsar site (protected under the Ramsar Convention) 89
Recommended strategies (for environmental impact assessment) 593–595
Recommended strategies (for mitigation of environmental impacts) 609–610
Recovery (from disturbance; see also Restoration) 71, 583, 584, 605, 609, 610
Reforestation (see also Drainage-basin management) 551
Reservoir, Kirundi Oya 540
Reservoirs 41, 62, 151, 522–524, 527, 529, 531, 532, 534, 539–540, 545, 550–551, 553–554
Resource partitioning (see Habitat specialization)
Respiration (of aquatic insects) 199–200, 209

Subject Index

- Restoration (see also Recovery) 73, 573, 598, 605–606
Riparian forest (see also Buffer strips) 90, 569, 570
Riparian zone (see also Buffer strips) 66, 356, 483, 569, 581, 607
Rivers (see also Streams)
Achankovil 47
Balui 540
Baram 556
Barito 20, 86
Beas 16
Beijiang 18, 19
Bhagirathi 553
Black 15
Boac 560
Burda 159
Brahmaputra 10, 13, 14, 16, 24, 26, 35, 39, 40, 42–45, 55, 86, 520, 538, 553, 568
Cauvery 10, 17, 34, 520
Champanala 53, 54
Chang Jiang 1, 9–11, 13–15, 17, 18, 28–30, 34, 35, 40, 43, 45, 50, 54, 56–58, 77, 81, 86–88, 100, 102, 112–115, 138, 139, 161, 443, 502, 520, 522, 524–526, 528–537, 549–551, 564, 571, 572, 598, 607
(see also Three Gorges Scheme)
Chao Phraya 10, 14, 76, 520, 560, 567, 569
Chao Phya 25, 572
Cho-shui 25
Chenab 10, 16, 520
Ci Manuk 520
Citarum 560
Clear 15
Damodar 25
Diguil 20
Dongjiang 18, 19, 533, 534
Fly 15, 20, 34, 86, 558, 567, 599
Ganges 10, 13–16, 26, 35, 37, 39, 40, 42–45, 50, 51, 54–57, 60–62, 70, 77, 81, 86, 87, 89, 91, 112, 142, 520, 537, 538, 553, 554, 559, 564, 568, 569, 571, 573, 598
Godavari 10, 14, 17, 55, 559, 564
Gombak 31, 36, 37, 41–47, 52, 61, 62, 71, 73, 419
Hanjiang 18, 19
Hari 20
Hongshui He 30
Ilog 25
Indus 9, 10, 13, 14, 16, 35, 41, 43, 45, 186, 519, 520, 538, 553, 554, 564, 568, 569
Irrawaddy 10, 13–15, 35, 142, 520, 547, 569
Jhelum 16, 186, 554
Jiulongjiang 18, 19
Kabul 16
Kahajan 20
Kampar 20
Kapuas 77, 88, 566
Karnali 553
Karnapuli 568
Kaveri 55
Kelantan 25
Kibune 419, 420
Klang 25, 27
Klias 568
Komering 88
Krishna 10, 14, 17, 25, 70, 172, 548
Kwai 32, 34
Lam Tsuen 36, 41, 44–47, 62, 63, 66, 68, 581
Lawe Konaweha 15
Luni 27, 520
Mae Nam Yom 520
Mahakan 20
Mahanadi 10, 17, 50, 520
Mahaweli 25, 522, 539, 540
Mas 520
Meghna 568

- Mekong 1, 4, 10, 13–15, 24, 26–28, 30, 34, 37, 40, 43, 55, 56, 58, 72, 75, 76, 79, 80, 81, 87, 88, 138, 139, 520, 541–549, 555, 560, 564–566, 569, 571–573, 598, 607, 608 (see also Mekong River flow regulation 541–549)
- Menik 539
- Min Jiang 520
- Minjiang 18, 19, 30
- Musi 20, 38
- Nanpan Jiang 30
- Narmada 10, 28, 107, 520, 538
- Negara 86
- Neyyar 47, 69
- Ogan 88
- Pachayar 47
- Pahang 15
- Pearl (see Zhujiang)
- Perak 25, 27, 563
- Pisang 160
- Polangui 25
- Pulan 20
- Purari 20, 28, 32–34, 40, 558
- Ravi 16
- Red 10, 14, 15, 40, 520
- Rokan 20
- Salween 10, 14, 76, 77, 139, 520
- Sampean 25
- Se San 25, 543, 545
- Sepik 10, 20, 34, 82, 85, 520, 574
- Solo 20, 27, 32–35, 37, 41
- Strickland 89
- Surabaya 520
- Sutlej 16
- Tapi 28
- Theun (Nam Thuen) 544, 545
- Tjiudjung 25
- Tonlé Sap 14, 15, 88, 541, 543
- Tulangbawang 520
- Tuntang 62
- Walawe 25, 27
- Xijiang 18, 19, 30
- Yamuna 554
- Yangtze (see Chang Jiang)
- Yujiang 30
- Zhujiang 10, 14, 18, 19, 28, 30, 34, 35, 50, 53, 55–57, 61, 77, 82, 105, 112–115, 151, 522, 532–534, 559, 564, 565, 520
- Zhujiang — flow regulation 532–534
- River Continuum Concept (RCC) 9, 44, 45, 63–70, 90, 91, 575, 582, 600–602, 608, 613
- River regulation 521–549
in China 522–537
of the Mekong 541–549
- Rostrum
of Decapoda 98
of Gastropoda 133
of Heteroptera 335
- Rotenone 557, 604
- Sarawak Forest Department 556
- Scraper functional-feeding group 64, 65, 67, 68, 405, 439, 499
- Seasonality (see also Life cycles and life histories) 523, 529, 537, 539, 542, 544, 549, 551, 564, 566, 569, 571–572, 580, 587–588, 594, 598, 606–607, 609
of climate 20–24
of fishes 79–82 (see also Fish breeding)
on floodplains 86–89
of hydrochemistry 36–38
of macrophytes 54
of organic load 43
of periphyton 52
of phytoplankton 50–51
of stream discharge 24–31
of zoobenthos 70–72
of zooplankton 54–55
- Secondary production 54, 69, 73, 74, 90, 238, 502, 579, 598, 609
- Sediment characteristics 41, 42, 63, 71, 420, 530

- Sedimentary organics 47, 48
Sedimentation (see also Erosion; Siltation) 41, 172, 530, 545, 550, 554, 556
Serial discontinuity concept 602
Sewage (see also Pollution) 35, 50, 54, 62, 559, 561
Sex reversal (see also Hermaphroditism) 80, 118, 129, 138, 177
Sexual dimorphism
 of aquatic Coleoptera 461
 of Ephemeroptera 208, 210, 288
 of *Macrobrachium* 176
 of Odonata 296
Shredder functional-feeding group 64–69, 265, 328, 331, 364, 429, 430
Silica 35, 36
Siltation (of lakes and rivers; see also Erosion; Sedimentation) 549, 550, 554, 558, 571
Size-frequency method (for estimating production) 74
Snowmelt 16, 18, 24, 26, 27
Sodium 32, 35, 36
Southeast Asia (geomorphic setting) 13–15
Spates (see also Disturbance; Flood flows) 48, 71, 72, 151, 152, 297, 419
Spatial variation in and among streams 59–63, 580–587
Species introductions (see Introduced species)
Stable-isotope techniques 600
Statistical analysis of time-series data 584
Statistical errors 591–593
Statistical power 591–592, 595
Statoblasts (of Ectoprocta) 109, 111
Stem-boring (by Lepidoptera) 516
Stemmata (of insects) 202
Storm tracks (see also Typhoons) 22
Streams (see also Rivers)
 Tai Po Kau Forest 36, 37, 41, 44, 45, 47–49, 51–53, 63, 73, 74
Stream-flow regulation 519, 521–549, 606, 607, 609
Stylocerite (of Decapoda) 164
Sulphates 32, 35, 87
Sungai (see Rivers)
Surfactant (causes ‘skimming’) 354, 484
Suspended load (see Transported load)
Swamp, Tasek Bera
Swamps (see also Floodplains) 15, 16, 18, 20, 38, 58, 79, 86–91, 563, 568, 572
Swarming behaviour
 of Corixidae 350
 of Dytiscidae 460
 of Ephemeroptera mayflies 208
 of Gerridae 352
 of Odonata 296, 298
 of Trichoptera 363, 392, 409
 of Veliidae 353
Swedish International Development Authority 542
Tai Po Kau Forest Stream (see Streams)
Tarsal claws (of insect legs) 203
Tarsus (of insect legs) 203
Tasek Bera Swamp 89
Temperature 16, 20, 23, 48, 49, 81, 174, 442, 477, 533, 537, 546, 564, 589
influence on life histories 72–73, 103, 141, 151, 174, 176, 286, 392, 459, 513
influence on longitudinal zonation 60–62, 84, 286, 296, 297
influence on Plecoptera 318, 333
Temporal variation in streams 587–589
Teneral insects 296

- Territorial behaviour (of dragonflies) 296
Three Gorges Scheme 17, 29, 81, 524, 525–532, 553, 572, 607
Tibia (of insect legs) 203
Transported load 33, 39–46
 Inorganic load 39–42
 Organic load 42–46
Trochanter (of insect legs) 203
Trout streams 186
Type-I statistical errors 591–593
Type-II statistical errors 591–593
Typhoons 21, 22, 27

Umbo (of Bivalvia) 147, 148

Variability
 in discharge 27–31
 in ionic composition 36–49
 among streams 585–587
 along streams 59–63, 580–584
 on small spatial scales 63, 584–585
 in time 587–589

Wallace's Line 77
Wallacea 9
Water allocation strategies (see also Stream-flow regulation) 607, 609
Water sharing (among nations) 539
Water-transfer schemes 532, 534–537
Weaver, John 426, 427
Weber's Line 77
Wetlands (including swamps; see also Floodplains) 15, 16, 18, 20, 38, 53, 58, 79, 86–91, 86–91, 539, 563, 568, 570–573, 607
Wetlands International (Indonesia) 89

Wetlands Management Programme (of the Mekong Secretariat) 608
Wheeler, Raymond 541
White waters 32
Wildlife Conservation Act (of Thailand) 567
Wildlife Fund of Thailand 565
Wing pads (of insect larvae) 203
Wood-boring animals (see also Xylophagous) 287, 289, 501, 502
World Bank 528, 538, 542, 548
Wu Chen-fu 323

Xylophagous (= wood eating; see also Wood-boring animals) 493

Yu the Great (Emperor of China) 523, 524

Zooids
 of Ectoprocta 107, 108
 of Entoprocta 111
 of Naididae 116
Zoobenthos (general ecology) 55–75
 composition in large rivers 55–57
 composition in small rivers 57–59
 distinctive features in Asia 57–59
 functional organization 63–70
 life histories 72–75
 longitudinal zonation 59–63
 microdistribution 63
 production 73–75
 seasonality 70–72
Zooplankton 54, 55, 70, 104, 161, 533, 579, 533

Organism Index

- Aaptosyax grypus* 546
Abacaria 359, 405, 406, 415
Abaria 358, 395
Ablabesmyia 504
Acanthacorydalis 512
Acanthametropodinae 217
Acanthametropus 217
Acanthopotamon 185
Acarina (see Hydrachnida)
Acentrella 217, 219, 223, 224, 227
Acerella 264, 272
Acetes 163
Acheilognathinae 156
Aciagrion 292
Acipenser dabryanus 529
Acipenser sinensis 530
Acisoma 294, 315
Aclinocera 508
Acmella 139
Acostaea 159
Acricotopus 504
Acrididae 509
Acrogomphus 293
Acroneuria 328
Acroneuriinae 321, 328
Acrydium 510
Actinolaimus 106
Acuticosta 155, 157
Adamietta 140
Adeleana 185
Adephaga 445, 446, 448, 456–464
Adiantum reniforme 529
Adicella 361, 422
Adinarthrella 360, 426
Adinarthrum 360, 426
Adriennella 354
Aegilipsicola 354
Aeolosoma 113, 118
Aeolosomatidae 117, 118
Aeschnophlebia 293, 311
Aeshnidae 293, 295, 299, 300, 302,
 310, 311
Aeshnoidea 293
Aesobia 447, 481

Organism Index

- Aethaloptera* 405, 409
Aethphemera 218, 283, 284, 285,
 286
Aethriamanta 294
Afghanurus 217, 235, 237, 238,
 242, 243, 252
Afragapetus 357
Afrindella 109
Afrindella bombayensis 110
Afrindella philippinensis 110
Afrindella tanganayikae 110
Afrindella testudinicola 110
Afromera 211, 218, 281, 282, 284,
 285
Afronurus 217, 235, 237, 242, 243,
 246, 247, 252
Afropisidium 161
Afroptilum 217, 233
Agabus 446, 459
Agapetinae 357, 377, 379
Agapetus 357, 377, 378, 379, 380
Agassizia 517
Agathon 494
Agelenidae 188
Agnetina 322, 323, 324, 325
Agoerodella 360, 426
Agoerodes 360, 426
Agraphydrus 446, 468
Agaptocorixa 350
Agriocnemidinae 292
Agriocnemis 292, 305
Agriomorpha 292
Agriopteridae 294
Agriotypidae 206, 518
Agriotypus 518
Agyrthacantha 293
Akryoshia 138
Akysidae 76
Alainites 217, 231
Alathyria 159
Albia 195
Alboglossiphonia 122, 124, 126
Alcedo 570
Alderflies (see Neuroptera)
Algae 2, 38, 42, 44, 51, 64, 67,
 70, 99, 104, 115, 131, 201, 209,
 254, 265, 323, 331, 364, 378,
 381, 384, 390, 392, 405, 430,
 443, 448, 463, 494, 495, 501,
 505, 507, 508, 509, 510, 517,
 562, 579, 603
Allagapetus 357
Alligator sinensis (= Yangtze
 alligator) 528, 530, 568
Allocapniella 333
Allocotocerus 446, 468
Allogaster 294
Allohelea 498
Allonaia 113, 117
Allopachria 446, 459
Alloperla 333
Allophyllus 80
Allopotamon 185
Allosetodes 361, 422
Allotorrenticola 195
Allotrioscoeladius 504
Allowandesia 197
Alluaudomyia 498
Alocinma 136, 137
Alpheidae 162, 163, 166, 167
Alpheus cyanoteles 163, 166, 167
Amarinus angelicus 179
Amarinus wolterecki 179, 180
Ambassidae 76
Ambassis wolffii 79
Ambia 517
Amblemidae 154, 155
Amblycipitidae 76
Amblystegium 495
Ameletidae 216
Ameletus 216, 217
Amemboa 352
Amerianna 144, 146
Ametor 446, 468
Ametropididae 217
Ametropus 217
Amika 494
Amisus 145
Amniclineus zhujiangensis 105
Ampharetidae 111

Organism Index

- Amphiaeschna* 293
Amphichaeta 117
Amphicnemidinae 292
Amphicnemis 292
Amphigomphus 293
Amphinemura 320, 330
Amphinemurinae 319, 330
Amphiops 446, 468
Amphipoda 58, 98, 186, 187
Amphipsyche 359
Amphipsyche meridiana 418
Amphipsychella 359
Amphipterygidae 292, 295, 301, 305, 307
Amphityrginae 292
Amphithemis 294
Amphizoa 446, 463
Amphizoa sinica 463
Amphizoidae 446, 448, 450, 454, 463
Ampullariidae (= Pilidae) 132, 134, 135, 136
Anabantidae 76, 88
Anabas 77
Anacaena 446, 468
Anachauliodes 512
Anaciaeschna 293
Anacrunoecia 360, 426
Anactinae 293
Anagapetus 357
Anagenesia 218, 281, 284, 285
Anchyrtarsinae 447, 471, 472
Ancylidae 65, 135, 142, 143, 145, 147
Ancyronyx 447, 481
Andersenella 352
Andrias davidianus 529
Aneckella 187
Anepeorinae 217, 242
Anepeorus 209, 217, 240, 242
Angilia 354
Angilovelia 354
Anguillidae (see also Eels) 76
Angulyagra 134
Anisitsiellidae 196
Anisocentropus 361, 429–431
Anisocentropus kirramus 430
Anisocentropus maculatus 430, 431
Anisogammaridae 187
Anisogomphus 293, 311, 312
Anisokantropus 361, 429
Anisolintropus 361, 429
Anisomontropus 361, 429
Anisopinae 339
Anisopleura 292, 303
Anisops 339
Anisoptera 65, 206, 293, 295, 300, 310–316
Annelida 65, 96, 112, 128
Annulipalpia 356, 358, 363, 364, 386–421
Anodonta 126, 148, 150, 152, 155
Anodonta woodiana 148, 150, 152, 155
Anormogomphus 293
Anotogaster 294, 314
Anser albifrons 529
Anser cygnoides 529
Anseriglossa 357
Antecaridina 166
Anthuridae 187
Antillocladius 503, 504
Antumelania 140
Antocha 491, 493
Anulotaia 134
Aonyx cinereus 570
Aparapotamon 185
Apatania 361, 443
Apataniana 361, 443
Apataniidae 361, 372, 442, 443
Apatelma 361
Apatidelia 361, 443
Aphanoneura 117
Aphelocheirinae 337, 345
Aphelocheirus 343, 345, 346
Aphelocheirus dudgeoni 343
Aphelocheirus malayensis 343
Aphelonecta 339
Aphrovelia 354
Apistomyia 494

Organism Index

- Aplatyphylax* 360, 443
Aplocheilidae 76
Apocrita 518
Apogonidae 76
Apple snails (see *Ampullariidae*)
Apsilochorema 357, 376, 377
Apsilochoreminae 357, 376
Apterygota 97, 198
Aptinocoris 345
Aquarius 353
Araceae 519
Arachnida 97, 188–197
Arachnothelphusa 185, 186
Araneae 98, 188–190
Archibasis 292, 305
Archineura 292
Archipelothelphusa 186
Arcidae 161
Arcidopsis 155
Arconia 155, 157
Arcteonais lomondi 114, 117
Arctoperlaria 317
Arctopsyche 359, 405, 407
Arctopsychinae (= *Arctopsychidae*)
 359, 368, 390, 405, 407, 408
Arctopsychodes 359, 405, 407
Ardisia 80
Argiinae 292
Argiolestes 292, 305
Argiolestinae 292
Argyractini 516
Argyroneta aquatica 188
Arhynchobdellida 119, 120, 121,
 126
Ariidae 76, 78
Aristichthys nobilis 78, 531
Arrenuridae 196
Arrenuroidea 194, 196
Arrenurus 195, 196
Arrenurus (Megaluracarus)
 bicorniculus 196
Arrenurus (Megaluracarus) rostratus
 196
Arrenurus (Micruracarus)
 gibberifrons 196
Arrenurus (Rhinophoracarus) luxatus
 196
Arrenurus madaraszi 196
Artabotrys 80
Arxama 517
Asachironomus 503, 504
Asahaya 362, 441
Ascalaphomerus 361
Asclepios 353
Asclerina 504
Asellidae 187
Asiagomphus 293, 311, 312
Asiatella 264
Asiaticobdella 125, 126
Asionurus 217, 235, 237, 240, 243,
 246, 250
Asotocerus 361, 429
Assiminea 139
Assiminea latericea 137
Assiminea lutea 137
Assimineidae 133, 136, 137, 138,
 139
Astaconeephrops 162
Asthenocnemis 293
Asthenocoris 345, 346
Asthenopodinae 218, 282, 286, 287
Astratodina 361, 443, 444
Asuragina 507
Atalophlebiinae 217, 218
Atax 195
Athericidae 486, 490, 507
Atherinidae 76
Atherix 507
Athripsodes 361, 423
Athripsodina 361, 422
Atomyiella 360
Atoperla 328
Atopopus 217, 235, 240, 241, 243,
 249, 250
Atractides 195, 196
Atractides (Atractides) conjunctus
 196
Atractides (Atractides) putahi 196
Atractides (Atractides) spatiiosus
 196

Organism Index

- Atrichopogon* 498
Atrichops 507
Aturidae 196
Aturus 195
Aturus viduus 196
Atya 167
Atyidae (see also Shrimps) 58, 65,
73, 104, 162, 163, 166–172, 174–
177, 181, 570, 571
Atylotus 508
Atyoida 165, 166, 167, 169, 172,
177
Atyoida pallipes 177
Atyoida serrata 172
Atyopsis 166, 167, 169, 177
Aulocodes 517
Aulacosolus 447, 478, 482
Aulodrilus 113, 114, 117
Aulodrilus pluriseta 114
Aulodrilus prothecatus 114
Aulonogyrus 446, 461
Aulophorus furcatus 114
Austotriaena 362
Astroallagma 292
Austrolestes 292
Austrolimnius 447, 481, 482
Austropeplea 145
Axonopsinae 196
Axonopsis 192, 195, 196
Axonopsis baumi 196
Axonopsis hornseyi 196
Ayabeopsyche 360
Azolla pinnata 54

Bachorema 357
Backswimmers (see Notonectidae)
Bacteria (see also Microbes) 48,
131
Badankia wendyae 196
Badidae 76
Baeotendipes 504
Baetidae 62, 65, 73, 201, 203, 208,
209, 213, 216, 217, 219–233,
234, 264, 265, 275
Baetidae genus indet. 234

Baetidae genus no. 1 (from Malaysia)
233
Baetiella 217, 219, 221, 223, 224,
227, 298
Baetis 217, 219–223, 225, 231, 232
Baetis feminalis 225
Baetogordius 107
Baetoidea 217
Baetopus 217, 233
Bagridae 76
Bagous 448, 484
baiji (see *Lipotes vexillifer*)
Bakousa 186
Baliomorpha 359, 405, 409, 411
Baliostrichia 357, 382
Balitoridae 76, 77
Balssiathelphusa 186
Balwantia 155
Bandakia 195
Baptista 354
Barba 217, 258, 261, 262
Barbaxonopsalbia 195
Barbaxonopsalbia pilosa 196
Barbronia 119, 122, 126, 127, 119,
126, 127
Barbronia weberi 122
Barbus 82
Barbus melanamphyx 82
Barilius 77
Barytelphusa 185
Bathyonchus 106
Bathytinodes 358, 403
Batissa 159, 160
Batissa violacea 160
Batrachoididae 76
Batracobdella 122, 123, 126
Batracobdella gracilis 126
Batracobdella kasmiana 126
Batracobdelloides 126
Bayadera 292, 303
Bdellocephala 103
Beetles (see Coleoptera)
Behningiidae 212, 213, 218
Behningiodea 218
Bellamya 134, 135

- Bellamyinae 134
Belonidae 76
Belontiidae 76
Belostoma 347
Belostomatidae 65, 335–337, 339, 345, 347, 349
Belostomatinae 348
Belovius 217, 235, 238
Belpitus 217
Beraeidae 362, 372, 442
Berosus 446, 466, 467, 468, 514
Bezzia 498
Bharatalbia 195
Bharatalbia (Japonalbia) darbyi 196
Bharatohydracarus 195
Bibiocephala 494
Bineurus 156
Biomphalaria straminea 135, 146
Birds 119, 121, 126, 130, 208, 497, 528, 529, 570, 571, 572, 601
Bithynia 136
Bithynia fuchsiana 137
Bithynia misella 137
Bithyniidae 131, 132, 133, 134, 136, 137
Bivalvia 56, 57, 65, 96, 147–161
Blaberidae 511
Blackfishes 79, 80
Blackflies (see Simuliidae)
Blattodea 511, 512
Blenniidae 76
Blepharicera 494
Blephariceridae 486, 490, 494
Blue-green algae 38, 131
Bogidiella 187
Bogidiellidae 187
Borborophyes 341, 342
Boreochlus 504
Boreoheptagyia 504
Bothrioneurum 113
Botia sidthimunki 566
Botocudo 356
Brachidontes 154
Brachiodrilus hortensis 114
Brachycentridae 65, 360, 364, 370, 435, 437
Brachycentriella 360
Brachycentrus 360, 437, 438
Brachycera 485, 486, 487, 507–509
Brachycerus 218, 275, 276, 280
Brachydiplacinae 294
Brachydiplex 294, 315
Brachygonia 294
Brachypogon 498
Brachythemis 294, 316
Brachytroninae 293
Brachyura 98, 177–186
Bradina 517
Bradinopyga 294
Brahmana 328
Branchiobdella 129
Branchiobdellida 94, 97, 127–129
Branchiobdellidae 128
Branchiura 113, 115, 116, 117
Branchiura souerbyi 114, 117
Bregmacerotidae 76
Brillia 504
Brotia 49, 64, 112, 135, 140, 141, 154
Brotia hamanensis 49, 64, 135, 141
Bryozoa 108, 111
Bryphaenocladus 504
Bubalus bubalus 572
Buccinidae 142
Buchonomyia 504
Buchonomyiinae 501, 504
Bulimidae 136
Bulimus 136
Bulinidae 147
Bulininae 147
Bullastra 145
Burmagomphus 293, 311, 312
Burmargiolestes 292
Byrrhinus 447, 483
Byssodon 497
Cacconeura 293
Caconeuriinae 293
Caddisflies (see Trichoptera)

Organism Index

- Caenidae* 60, 62, 65, 203, 204, 211, 213, 218, 265, 275–281
Caenis 218, 275, 276, 279, 280, 281
Caenis nigropunctata 276
Caenoculis 218, 275, 276, 280
Caenodes 204, 218, 275, 276, 277, 278, 281
Caenodes sp. 1 277
Caenodes sp. 2 278
Caenoidea 218
Caenomedia 218
Calamoceratidae 65, 361, 364, 371, 429–432
Calcinemiinae 293
Calicnemia 293, 305
Calilestes 292
Calineuria 328
Caliphaea 292
Caliphaeinae 292
Callionymidae 76
Calocypha 292
Calonyx 195
Calopterygidae 292, 295, 297, 301, 308, 309
Calopteryginae 292
Calopterygoidea 292
Calopteryx 292
Calyptobates 352
Camacinia 294
Cambaridae (see also Crayfish) 98, 162
Cambarinae 162
Cambaroides 129, 162
Cambaroidinae 162
Campoceras 146
Camptoceras 142, 144
Camptocerus austeni 144
Camptomastix 517
Camptopterohelea 498
Cancrocaeca xenomorpha 179, 180
Candidiopotamon 184, 185
Cantharoidea 448
Canthhydrus 446, 462
Caobangia 111, 112
Caobangia billeti 112
Capnia 333
Capniidae 317, 320, 333
Carcharhinidae 76
Carcharias gangeticus 571
Cardinalfish 82
Cardiocladius 501, 504
Caridea 98, 162–177
Caridina 58, 104, 129, 166–169, 171, 174–176, 570, 570, 167
Caridina lanceifrons 175
Caridina singhalensis 176, 570
Caridinicola 104
Caridinophila 128, 129
Caridinophila unidens 128
Cassitettix 510
Cats 570
Catachysta 517
Catala catala 78
Catenula 104
Catenulida 104
Caterpillars (see Lepidoptera)
Catfishes 77, 78, 82, 85, 88, 546, 565
Catlocarpio siamensis 563, 565
Catoxyethira 357, 382
Cattle leech 127
Caudiculatus 155
Cavocoris 344, 345
Celebagriolestes 292
Celebophlebia 294
Celebothemis 294
Centropomidae 76
Centroptella 217, 220, 227, 229
Centroptilum 217, 229, 233
Cephaeschna 293, 311
Cephalolimnius 447, 481
Ceraclea 361, 422, 423, 424
Ceradryops 447, 482, 483
Cerasina 145
Ceratophyllaceae 517
Ceratophyllum 54, 517
Ceratophyllum demersum 54
Ceratopogonidae 65, 486, 487, 488, 488, 490, 498–499

- Ceratopogoninae 488, 498
Cercion 292
Cerconychia 329
Cercotmetus 341
Ceriagrion 292, 296, 305
Cerithioidea 140
Cerobrachys 218
Cervus duvauceli 572
Cervus eldi 572
Cervus shomburgki 572
Cestoidea 102
Ceylanopsyche 362, 441, 442
Ceylonthelphusa 186
Chacidae 76
Chaetarthria 446, 465, 468
Chaetocladius 504
Chaetogaster 113, 116, 117
Chalybeothemis 294
Chamberlainia 155
Chamlongia 137
Channa marulioides 81
Channa micropeltis 79
Chanidae 76
Channidae (see also Snakeheads) 76, 88
Chaoboridae 486, 490
Chappuisides 195
Chara 463
Characoidea 77
Chasmogenus 446, 468
Chaudhuriidae 76
Cheirochela 345, 346
Cheirochelinae 337, 346
Chelicerata 96, 97, 188–197
Chelipoda 508
Cherax 104, 162
Chernovskia 504
Cheumatopsyche 62, 74, 359, 405, 406, 411–413, 416–419, 421
Cheumatopsyche criseyde 74, 413, 419
Cheumatopsyche spinosa 419
Cheumatopsyche ventricosa 74, 414, 419
Chimarra 356, 358, 387–389
Chimarra sp. 1 387
Chimarra sp. 2 387
Chimarra sp. 3 387
Chimarra sp. 4 387
Chimarrhometia 352
Chimarrinae 358
Chimonereis 111
Chinoperla 324, 327
Chirocentridae 76
Chironomidae 56, 57, 60, 65, 73, 106, 190, 323, 456, 485, 486, 488, 490, 499–505
Chironominae 57, 65, 489, 500–502, 504
Chironomus 70, 502, 504
Chirotonetes 234
Chiisanophlebia 217, 260
Chlorella 100
Chlorocyphidae 292, 295, 297, 300, 306, 308
Chlorocyphinae 292
Chlorogomphinae 291, 294, 313
Chlorogomphus 294, 295, 313, 314
Chlorohydra 100
Chlorolestidae 292
Chloroperlidae 317, 321, 333, 334
Chlorophyta 52
Chloropsyche 359
Chlorostracia 140
Chopralla 217, 220, 227, 230, 231
Chordodes 107
Choroterpes 204, 217, 218, 254, 260–264
Choroterpes (Choroterpes) sp. 261
Choroterpes (Euthraulus) sp. 263
Choroterpedes 218, 254, 258, 262
Chromarcyninae 217
Chromarcys 217, 233, 234
Chromarcys feurborni 234
Chrysomelidae 448, 450, 456, 484
Chrysomeliodea 448
Chrysopseudodon 156
Chrysotrichia 357, 382, 386
Chulathelphusa 186

Organism Index

- Chrysops* 508
Cichlidae 77, 574
Ciconia boyciana 529
Ciconia nigra 529
Ciliometra 352
Cincticostella 218, 264, 266, 266,
268, 271, 274
Cinygma 217, 235, 241, 242, 253
Cinygmina 74, 217, 235, 237, 242,
243, 247, 249
Cinygmoides 217, 235, 238
Cinygmula 217, 235, 239, 241,
242, 252, 253
Cipangopaludina 134
Cirrhinus auratus 546
Cirrhinus lobatus 80
Cirrhinus molitorella 534
Cirrhinus mrigala 78
Cirrodrilus 128, 129
Claassenia 322, 324, 325, 328
Claasseniini 324
Cladocera 55
Cladopelma 504
Cladotanytarsus 504
Clariidae 76
Clarius 77
Clea 142
Clenchiella 138
Clinocera 508
Clinohelea 498
Clinotanypus 504
Clithon 134
Clithon corona 134
Clithon retropictus 134
Clivitettix 510
Cloeodes 217, 220, 229, 230, 231
Cloeon 216, 217, 228, 229, 230,
233
Clunio 504
Clupanodon thrissa 534
Clupeidae 76, 531, 537, 564
Clypeocaenoides 218, 275, 276, 280
Clypeodytes 446, 459
Cnemisticta 293
Cnethocymatia 350
Cnidaria 94, 95, 100–102
Cnoodcentron 358, 395
Cobitidae 76
Cochliophylax 362, 435
Cockroaches (see *Blattodea*)
Coelambus 459
Coeliccia 293, 305
Coelostoma 447, 465
Coenagrion 292
Coenagrionidae 292, 293, 302,
304, 305
Coenagrioninae 292
Coenagrionoidea 292, 293
Coleoptera 59, 60, 65, 73, 197,
198, 199, 206, 207, 334, 444–484
Collembola 97, 198, 205, 509, 510,
509, 510
Colobaea 509
Colpomera 360, 442
Colymbetinae 446
Compsoneuria 217, 235, 237, 241,
242, 243, 246, 250
Compsoneuriella 235, 237, 246
Conchapelopia 504
Congridae 76
Contradens 155
Convoluta anostica 104
Copelatus 446, 459
Copepoda 55
Copera 293, 305
Coptocatus 343, 345, 346
Corbicula 61, 149, 151, 152, 158–
160
Corbicula fluminalis 152, 158,
159, 160
Corbicula fluminea 149, 151, 152,
158, 159, 160
Corbicula japonica 160
Corbicula leana 160
Corbicula manilensis 160
Corbiculacea 159
Corbiculidae 58, 149, 151, 152,
153, 158–160
Cordulegasteridae 291, 294, 295,
303, 313, 314

Organism Index

- Cordulegasterinae 294, 313, 314
Cordulegasteroidea 294
Corduliidae 291, 294, 298, 300, 303, 315, 316
Cordylophora 100, 101
Corixidae 65, 335, 336, 338, 349, 350
Corixinae 349, 350
Corixoidea 338
Corvospongilla 99
Corydalidae 65, 512–515, 512–515
Corynoneura 504
Cosmopseudodon 156
Coutierella 164, 168, 171
Coutierella tonkinensis 168
Crabs 58, 64, 97, 98, 104, 111, 126, 129, 131, 161, 162, 177–186, 497
Cranes 529
Craneflies (see Tipulidae)
Crangonyctidae 187
Crangonyx 187
Craspedacusta 100, 101
Craspedacusta simensis 100
Craspedacusta sowerbii 100
Cratilla 294, 316
Crayfish (see also Cambaridae) 104, 129, 162
Cremnoconchus 136
Crenitis 446, 468
Crickets (see Gryllidae)
Cricotopus 504
Crinitella 218, 264, 268, 271
Criotettix 510
Cristaria 155, 158, 155, 158
Crocodiles (see also Alligator; Gharial; *Crocodylus*) 567, 568
Crocodylus mindorensis 568
Crocodylus novaeguineae 89, 568
Crocodylus palustris 568
Crocodylus porosus 568
Crocodylus siamensis 568
Crocothemis 294, 316
Cruciferae 87
Crunobiodes 360
Crunoecia 360
Crunoeciella 360
Crustacea 65, 96, 97, 126, 128, 161–188
Cryptchiops 171
Cryptobates 352
Cryptochironomus 501, 504
Cryptopenella 218, 260, 262–264
Cryptoperla 329
Cryptopotamon 178, 181, 185
Cryptopotamon anacoluthon 178, 181
Cryptotendipes 503, 504
Ctenacroscelis 491, 492
Ctenipocoris 345, 346
Ctenochauliodes 512
Ctenodesma 156
Ctenopharyngodon idella 78, 531
Culicidae 65, 485, 486, 490, 499
Culicoides 498
Culmenella 146
Cuneopsis 156, 157, 156, 157
Curculionidae 448, 450, 453, 484
Curculionoidea 448, 449
Currothelphusa 186
Curupirina 494
Cuspidariidae 161
Cuspidevia 447, 482
Cyathura 187
Cybister 446, 459
Cyclocheilichthys enoplos 79
Cyclogomphus 293
Cyclophaea 292
Cyclotropis 139
Cylindrostethinae 353
Cylindrostethus 353
Cylindrothelphusa 185
Cylindrotominae 491, 493
Cylloepus 481
Cymatia 350
Cymatiinae 350
Cymodetta 187
Cynogale bennetti 570
Cynoglossidae 76
Cyperaceae 87, 569

Organism Index

- Cyphon* 447, 470
Cyprinidae (see also Major carp) 75, 76, 77, 82, 87, 88, 546-547
Cyrano 292
Cyrenobatissa 159, 160
Cyrenobatissa subsulcata 160
Cyrenodonax 159, 160
Cyrnopsis 359
Cystobranchus 126
- Dampfitrichia* 357
Damselflies (see Odonata; Zygoptera)
Dasyatidae 76, 566, 567
Dasyatis chaophraya 567
Dasyhelea 499
Dasyheleinae 488, 498, 499
Dasytegia 360
Davidioides 293
Davidius 293, 312
Davidraena 446, 464
Decapoda 58, 60, 72, 78, 94, 97, 98, 128, 161-188, 537
Deer, brow-antlered 572
Deer, Chinese water 529
Deer, swamp 572
Deielia 294, 316
Delavaya 138
Demanietta 185
Demicryptochironomus 503, 504
Dendrocoelidae 103
Dendrocoelopsis 103
Dero 113, 114, 116, 117
Dero digitata 114, 117
Dero dorsalis 114
Dero nivea 114
Deronectes 446, 459
Derris 557
Deuterophlebia 494, 495
Deuterophlebiidae 486, 489, 490, 494
Devadatta 292, 305, 306
Diamesa 504
Diamesinae 500, 504
Diaphorocoris 345, 346
Diatoms 51, 52, 61, 71, 128, 131, 381, 390, 392, 395, 494, 507, 509
- Diaurora* 156
Diceratocephala boschmai 104
Dicranomyia 491, 493
Dicranopselaphus 447, 476
Dicranota 491, 493
Dicrephemera 284
Dicrotendipes 504
Digoniostoma 136
Dina 122, 125, 127
Dina japonica 122
Dinarthrella 360, 426
Dinarthrena 360, 426
Dinarthrodes 360, 426, 427
Dinarthropsis 360, 426
Dinarthrum 360, 425-427, 429
Dineutus 446, 461
Dinobdella 124, 126, 127
Dinomyia 360, 426
Diotopsis 494
Diplacina 294
Diplacodes 294, 296, 315, 316
Diplectrona 359, 405, 407, 408
Diplectronella 359, 405, 408
Diplectroninae 359, 369, 405, 407, 408
Diplex 359, 405, 408
Diplodontus 195
Diploglossa 357
Diplonychus 335, 347-349
Diplonychus rusticum 335, 348
Diplopseudodon 156
Dipseudopsidae 65, 358, 364, 367, 403-404
Dipseudopsis 358, 403, 404
Diptera 59, 60, 65, 73, 106, 194, 198, 199, 200, 202, 205, 433, 437, 484-509, 512
Dipteromimus 217
Dipterophlebiodes 218, 260
Discomya 155, 156
Disparocypha 292
Disparocyphinae 292
Disparonerinae 293
Disparoneura 293, 305

Organism Index

- Distotropes* 341
Dixa 505
Dixidae 65, 486, 490, 505
Djalmabatista 504
Dobsonflies (see *Megaloptera*)
Dolichocephala 508
Dolichohelea 498
Dolichopeza 491, 492
Dolichopodidae 486, 509
Dolichopus 509
Doloclanes 358, 388, 389
Dolomedes 188, 189, 518
Dolomedes pallitarsis 189
Dolomedidae 188
Dolomyia 358, 388
Dolophilella 358
Dolophilodes 358, 388, 389
Dolopsyche 358, 388
Dolphins 89, 528, 530, 547, 568, 569, 89
Dolphin, Chinese river (see *Lipotes vexillifer*)
Dolphin, gangetic (see *Platanista gangetica*)
Dolphin, Irrawaddy (see *Orcaella brevirostris*)
Dolphin, whitefin (see *Lipotes vexillifer*)
Dolphins, Indus (see *Platanista minor*)
Donaciinae 448, 450, 484
Dorylaimidae 106
Dorylaimus 106
Dosilia 99
Downeshelea 498
Dragonflies (see Odonata; Anisoptera) 197, 198, 208, 291, 295–298, 311
Dreissenidae 154
Drepanocentron 358, 395
Drepanosticta 293, 305
Dromothelphusa 185
Drunella 218, 264, 265, 268, 271, 272
Drunella corpulenta 271
Drunella gilliesi 271
Drunella uenoi 271
Drupeus 476
Dryopidae 65, 197, 445, 447, 452, 455, 482, 483
Dryopoidea 447, 449, 482
Dryopomorphus 448, 481
Dryops 447, 482, 483
Dubitogomphus 293
Dugesia 102–104
Dugesia andamanensis 102
Dugesia annandalei 102
Dugesia bactriana 102
Dugesia burmaensis 102
Dugesia indica 102
Dugesia japonica 102
Dugesia lindbergi 102
Dugesia nannophallus 102, 104
Dyaperla 324
Dysphaea 292
Dytiscidae 65, 446, 448, 449, 450, 454, 456–460, 462, 463
Dytiscinae 446
Eatonigenia 218, 281, 284, 285
Ecdyonuridae (see Heptageniidae)
Ecdyonurini 238, 243, 246, 248, 250, 252, 238, 243
Ecdyonuroides 235, 237
Ecdyonurus 217, 237, 242, 246, 248, 252, 253
Echinobaetis 209, 217, 226, 227
Echinobaetis phagas 227
Echinohelea 498
Echo 310
Ecnomidae 65, 358, 369, 400–403
Ecnomus 358, 400–403
Ecnopsyche 359, 405, 406, 416
Ecpolopsis 195
Ectopria 447, 474, 475, 476
Ectoprocta 95, 107–111, 424
Edidiebla 358, 388, 389
Edmundsula 218, 259, 261
Edoneus 166, 167
Edpercivalia 377

Organism Index

- Eels 78, 537
Eichhornia crassipes 54, 63
Einfeldia 504
Eiseniella 113
Ekadanta 139
Elamenopsis introverta 179
Elattoneura 293
Electragapetus 357
Electrogena 74, 217, 237, 242, 243, 247, 248, 252
Electrogena sp. 74
Eleotridae 76, 78
Elephants 572
Elliptera 491, 493
Elmidae 60, 65, 445, 447, 452, 455, 456, 457, 476–482
Elminiae 447, 477, 481
Elminthidae (see Elmidae)
Elmomorphus 447, 483
Elodes 447, 470
Elongaria 156
Elophila 517
Emmericiopsis 136
Empididae 65, 486, 490, 507, 508
Enallagma 292
Encntridophorus 195
Enchytraeidae 114, 115, 116
Enchytraeus sp. 114
Enckella 187
Endochironomus 504
Endopterygota 198
Engraulididae 76
Enhydrinae 446, 461
Enicurus 570
Enithares 339
Enochrus 446, 466, 467, 468
Ensidens 156
Entognatha 97
Entomovelia 355
Entoprocta 111
Eobrachycentrus 360, 437
Eodinarthrum 360, 426
Eogomphus 293
Eomystra 357
Eoneureclipsis 358, 394, 395
Eonychus 447, 482
Eoophyla 516, 517
Eopolymitarcys 287
Eothremma 361, 439
Eotrechinae 352
Eotrechus 352
Epallagidae 292
Epalzeorhynchos bicolor 566
Epeiron 217, 237, 238, 252
Epeorella 217, 237, 249
Epeorus 74, 217, 237, 239, 242–245, 252, 253, 298
Epeorus sp. 74, 244
Ephacerella 218, 264, 268, 272
Ephemera 74, 218, 281–286
Ephemera (Aethephemera) nadinae 286
Ephemera (Aethephemera) pictipennis 286
Ephemera (Ephemera) spilosa 74, 283
Ephemerella 70, 218, 264, 265, 268, 272, 274
Ephemerella (?) nasiri 272
Ephemerella (?) wahensis 274
Ephemerellidae 65, 212, 213, 214, 218, 264–275
Ephemerellina 218, 264–266, 275
Ephemerellina ornata 265
Ephemerellina sinensis 265
Ephemerellina xiaosimaensis 265
Ephemerellinae 218, 264
Ephemeridae 60, 65, 73, 211, 213, 218, 281–286, 289
Ephemerinae 218, 281, 284–286
Ephemeroidea 209, 210, 218, 281, 282
Ephemeroptera 59, 60, 61, 62, 63, 65, 72, 73, 106, 197–200, 202, 203, 204, 205, 206, 207, 209, 210, 207–290, 365, 501, 503
Ephoron 218, 282, 287
Ephydatia 99
Ephydriidae 486, 489, 508

Organism Index

- Epigomphinae* 293
Epilampra 511
Epilamprinae 511
Epilichas 447, 471, 472
Epiophlebia 291, 293
Epiophlebiidae 293, 300
Episetodes 361, 423
Epithemis 294
Epoicocladius 501, 503, 504
Epophthalmia 294, 314
Eretes 446, 459
Eriocera 491
Eriocheir 177, 178, 179, 182
Eriocheir formosa 177
Eriocheir hepuensis 178
Eriocheir japonicus 177, 178
Eriocheir leptognathus 177
Eriocheir recta 177
Eriocheir sinensis 177, 178
Erioptera 491, 493
Eristina 517
Ernades 362, 442
Erotesis 361
Erpobdella 119, 122, 125, 127
Erpobdellidae 119, 120, 121, 122, 127
Esakia 353
Esamthelphusa 186
Esme 293
Esolus 447, 481, 482
Eteone 111, 112
Etheriidae 150, 152, 159
Etrocōrema 321, 324, 326
Etroplus 77
Eubasilissa 360, 442, 443
Eubrianacinae 447, 475
Eubrianax 74, 447, 473–475
Eubrianax sp. 74, 474
Eubriinae 447, 473, 475, 476
Eucapnopsis 333
Eucinetoidea 447, 449
Eucta javana 188
Eugenia 80, 89
Euholognatha 317
Eukiefferiella 504
Eulichadidae 447, 452, 456, 471–472
Eulichas 447, 471, 472
Eunapius 99
Eupera 161
Euphaea 74, 292, 296, 298, 303, 304
Euphaea decorata 74, 296, 298, 304
Euphaeidae 292, 295, 296, 298, 300, 303, 304, 306
Eurylophella 218, 264, 265, 266
Euscelimena 510
Eusimulum 497
Eusiriidae 187
Eusmittia 504
Euthraulus 218, 260, 263, 264
Euthyplociidae 287
Euthyplociinae 213, 218, 282, 287, 289
Evanophanes 361, 443
Exopalaemon 164
Exopterygota 198
Eylais 195
Eylaoidea 191, 194
Eyriesia 134
Fairbankia 137
Fansipangana 357, 373, 376
Faunus ater 141
Felicitomyia 495
Felis planiceps 570
Felis viverrina 570
Feltria 195
Feltriella 195
Fenouilia 138
Ferrissia 135, 147
Ferrissia baconi 135
Ferrissiidae (see *Ancylidae*) 142
Ficus 80
Filopaludina 134
Fingernail clams (see *Sphaeriidae*)
Fireflies (see *Lampyridae*)
Fishes 8, 9, 11, 38, 58, 61, 64, 75–86, 87, 88, 89, 100, 126, 149,

Organism Index

- 188, 477, 528, 530, 531, 533, 534, 537, 542, 547, 549, 551, 556, 558, 563–567, 570, 571, 574, 579, 599, 603, 607
Fishflies (see Megaloptera)
Fishing eagles 570
Fittkauimyia 504
Flacourtiaceae 88
Flatworms (see Turbellaria)
Flavohelodes 447, 470
Flies (i.e. 'true' flies: see Diptera)
Flukes (see Trematoda)
Fluviopupa 138
Folga 324
Fonticola 103
Fontinalis 495
Forbesopomus 136
Forcipomyia 498, 499
Forcipomyiinae 488, 498, 499
Forktails 570
Formosita 323
Fredericella 109, 110
Fredericella sultana 110
Fredericellidae 109, 110, 109, 110
Frogs (sse also Tadpoles) 126, 567
Fukienogomphus 293, 312
Fungi (see also Microbes) 48
Furcaperla 327
Gabbia 136
Galba 145
Galta 358
Gammaridae 186, 187
Gammarus 187
Gammarus pulex 186
Gangetica 139
Ganonema 361, 429, 430
Ganonema extensum 430
Garra 77
Gastrocentrella 361
Gastrocentrides 361, 440
Gastrogomphus 293, 312
Gastropoda 56, 57, 65, 72, 96, 129–147, 181
Gavialidium 510
Gavialis gangeticus 568
Gecarcinucidae 180, 181, 183, 184, 185
Gecarcinucoidea 180, 183, 184, 185
Gecarcinucus 185
Geese 529
Geithusa 186
Gelastocoridae 337, 350, 351
Gelatinella toanensis 109, 110
Gellatinella 109
Gelona 159
Geoparnus 447, 483
Georgium 361, 429, 430, 432
Georgium japonicum 430, 432
Georgium sp. 432
Georissidae 447, 451, 454, 468, 469
Georissus 447, 469
Geosesarma 179, 183, 184
Geosesarma malayanum 179
Geosesarma notophorum 179
Geothelphusa 184, 185
Gerreidae 76
Gerridae 188, 335, 336, 338, 351–353
Gerrinae 352, 353
Gerris 353
Gerriselloides 352
Gerroidea 338
Gerromorpha 65, 334, 336, 338, 351–356
Gestroiella 345, 346
Gharials (see also Crocodiles) 567, 568
Gibobia 328
Gigantometra 351, 353
Gigantometra gigas 351
Gilliesia 218, 260
Glauconomidae 161
Glauconomya 161
Gleevinkia 186
Globaria 468
Glossamia gjellerupi 82

Organism Index

- Glossiphonia* 118, 119, 122, 124, 126, 119, 122, 124, 126
Glossiphonia heteroclita 126
Glossiphonia weberi 118
Glossiphoniidae 118–122, 126, 156
Glossoscolecidae 113, 115
Glossosoma 357, 377–379
Glossosomatidae 65, 357, 358, 364, 366, 377–380
Glossosomatinae 357, 377, 379
Glyphidrilus 113
Glyphotaelius 361, 443
Glyptophysa 146
Glyptotendipes 504
Gnathobdellida 119
Gnathopogon argentatus 82
Gnathotrichia 357
Gobiidae 76, 78
Gobioididae 76
Goddardobdella 120
Goera 361, 439, 440
Goeridae 361, 369, 435, 439, 441
Goermella 360
Goerodella 360, 426
Goerodes 360, 425–429
Goerodes doligung 426, 428
Goerodes emarginatus 425
Goerodina 360, 426
Golden dragon fish (see *Scleropages formosus*)
Gomphaeschninae 293
Gomphidae 291, 293, 295, 296, 297, 302, 311–314
Gomphidia 293, 311, 312
Gomphidictinus 293
Gomphinae 293
Gomphoidea 293
Gomphostilbia 497
Gomphus 312
Gondraena 446, 464
Gonomyia 491, 493
Gordionus 107
Gordius 107
Gouramies (see also Anabantidae; Osphronemidae) 78
Gramineae 87
Grammeubria 476
Granuleubria 447, 476
Graphelmis 447, 477, 481
Graphosolus 447, 482
Grapsidae 177–179, 182, 183, 184
Grasshoppers (see Orthoptera) 509
Gratia 217, 225, 227
Greyfishes 80, 81
Grouse locusts (see Tetrigidae)
Grouvellinus 447, 481
Grus japonensis 529
Grus leucogeranus 529
Gryllidae 511
Gryllotalpa 511
Gryllotalpidae 198, 511
Gubernatoriana 185
Guineaxonopsis 195
Gumaga 362, 441
Gundlachia 147
Gunungiella 358, 388, 389
Guoia 138
Gymnolaemata 109, 110
Gynacantha 293, 311
Gynacanthaechina 293
Gynacanthinae 293
Gyraulus 144, 146
Gyraulus convexiusculus 144
Gyrinidae 65, 334, 446, 448, 450, 453, 457, 460–462
Gyrininae 446, 461
Gyrinocheilidae 76
Gyrinulus 462
Gyrinus 462
Haasodonta 156
Habrophlebiodes 218, 254, 256, 260, 262
Habrophlebiodes gilliesi 256
Haemadipsidae 119
Haematopota 508
Haemonais 113, 117
Haemopidae 119, 127
Haemulidae 76
Hageniinae 293

Organism Index

- Hagenoides* 293
Hairworms (see *Nematomorpha*)
Halacaridae 191, 194
Halewisia 138
Haliplidae 65, 446, 448, 450, 453, 457, 463, 467
Haliplus 446, 463
Halobates 353
Halobatinae 353
Halophytes 53
Haloveliiinae 354
Hammatorrhina 494
Haplotaixidae 113, 115
Haplotaxis 113, 115
Haraldia 447, 482
Harmandia 156
Harnischia 501, 504
Hebridae 338, 355
Hebrinae 355
Hebroidea 355
Hebrus 355
Hedotettix 510
Hedyselmis 447, 481
Heleidae (see *Ceratopogonidae*)
Heleniella 504
Heleoecoris 345, 346
Heliaeschna 293
Helichus 447, 482, 483
Helicopsyche 362, 366, 435, 436
Helicopsychidae 65, 362, 364, 434–436, 441
Helicorbis 146
Heligomphus 74, 293, 296, 297, 311, 312, 313
Heliogomphus scorpio 74, 296, 297, 311, 313
Heliosmylus 512
Helius 491, 493
Hellyethira 357, 382, 386
Helminthidae (see *Elmidae*)
Helobdella 121, 122, 126
Helobdella stagnalis 126
Helochares 446, 468
Helodidae (see *Scirtidae*)
Helopeltarium 446, 468
Helophoridae 447, 452, 455, 468, 469
Helophorus 447, 469
Helostomatidae 76
*Helotrephe*s 341
Helotrepidae 65, 335, 337, 339–341, 337, 339–341
Helotrophinae 341
Hemerodromia 508
Hemianax 293
Hemiclepsis 123, 126
Hemicordulia 294
Hemiptera (see *Heteroptera*) 57, 197–199, 202, 206, 207, 334, 365
Hemirhamphidae 76
Heptagenia 217, 237, 238, 241, 242, 252
Heptagenia-ally (from Sulawesi) 238
Heptageniid lineages (groups i–iii) 242
Heptageniidae 65, 73, 212, 213, 217, 235–253
Heptageniinae 217, 242, 246, 251, 252
Herbertorossia 74, 359, 405, 407, 415, 417, 419, 421
Herbertorossia quadrata 74, 415, 417, 419, 421
Hercostomus 509
Herophydrus 446, 459
Hesperoconopa 491, 493
Heterotractides 195
Heterobates 353
Heteroceridae 447, 451, 456, 483
Heterocerus 447, 483
Heterocleptes 355
Heterocleptinae 355
Heterogenesia 284
Heteronaias 294, 316
Heterophaea 292
Heteropneustidae 76
Heteroptera 57, 59, 65, 188, 197, 198, 199, 202, 206, 207, 334–356, 365

Organism Index

- Heterothelphusa* 186
Heterotrepes 341
Heterotriassocladus 504
Heudeana 156, 158
Hexagenia 284
Hexagenia philippina 284
Hexageniinae 218, 281, 284, 285, 286
Hexagenoidea 217
Hexanippónacarus 197
Hexatoma 491, 493
Hexaxonopus 195
Hilsa (see *Tenualosa*)
Himalagrion 292
Himalayum 497
Humalopsyche 357, 373, 375, 376
Humantura (see *Dasyatis*)
Hippeutis 144, 146
Hippeutis cantonensis 144
Hippeutis umbilicalis 144
Hirudinaria 124, 125, 126, 127
Hirudinea 65, 96, 118–127, 128, 156
Hirudinidae 119–122, 126, 127
Hirudo 125, 126, 127
Hisaura 358, 388
Hislopia 109, 110
Hislopia cambodgiensis 110
Hislopia lacustris 110
Hislopia malayensis 110
Hislopia moniliformis 110
Hislopidae 110
Holocentropus 359, 397, 399
Holometopus 177
Holorusia 491, 492
Holthuisiana 186
Homalium brevidens 88
Homalopteridae (see *Balitoridae*)
Homalosolus 447, 482
Homoeogenus 447, 475
Horaia 494
Horaiella 505
Huananpotamon 185
Huonia 294
Hyale 187
Hyalidae 187
Hyalinella 109, 110
Hyalinella diuaniensis 110
Hyalinella indica 110
Hyalinella minuta 110
Hyalocentropus 358
Hyalopsyche 358, 403
Hyalopsychella 358, 403
Hyboella 510
Hybomitra 508
Hybos 508
Hydaticus 446, 459
Hydatomanicus 359, 405, 411, 412, 415
Hydatopsyche 74, 359, 405, 415, 416, 419, 420
Hydatopsyche mellii 74, 419, 420, 419, 420
Hydnocarpus 80, 88
Hydnocarpus anthelmintica 88
Hydra 100
Hydrachna 195
Hydrachnida 98, 156, 188, 190–197
Hydrachnoidea 194
Hydraena 446, 464, 465
Hydraenidae 65, 197, 445, 446, 451, 454, 464, 465
Hydraphantoidea 194, 196
Hydridae 100
Hydrilla verticillata 54, 517
Hydrobasileus 294, 316
Hydrobidae 18, 133, 136, 138
Hydrobioides 136
Hydrobiomorpha 446, 468
Hydrobiosidae 357, 364, 366, 376, 377
Hydrobiosinae 357, 376
Hydrobius 446, 468
Hydrocanthus 446, 457, 462
Hydrocassis 446, 468
Hydrochara 446, 468
Hydrocharitaceae 517
Hydrochidae 447, 453, 455, 468, 469

Organism Index

- Hydrochus* 447, 469
Hydrocoptus 460, 462
Hydrocyphon 74, 447, 470, 471
Hydrocyphon sp. 74
Hydrodroma 195, 196
Hydrodroma monticola 196
Hydrodromidae 196
Hydroglyphus 446, 459
Hydroida 100
Hydromanicus 359, 405, 411, 412, 416, 417
Hydromermis 106
Hydrometra 355
Hydrometridae 338, 355
Hydrometrinae 355
Hydrometroidea 355
Hydronebrius 446, 459
Hydronema 359, 405, 407, 409
Hydrophilidae 65, 445, 446, 453, 455, 457, 464–468, 469, 514
Hydrophilinae 446, 465, 468
Hydrophiloidea 446, 449, 451, 455, 464, 468
Hydrophilomima 446, 466, 468
Hydrophilus 446, 468
Hydroporinae 446, 459
Hydroporus 446, 460, 462
Hydropotes inermis 529
Hydropsyche 74, 359, 405, 409, 411, 412, 414, 416–421
Hydropsyche chekiangana 74, 417, 419, 420, 421
Hydropsyche tsudai 420
Hydropsychidae 60, 65, 70, 73, 359, 364, 368, 369, 390, 401, 405–421
Hydropsychinae 359, 369, 405, 408, 411–419
Hydropsychodes 359, 405, 411, 416
Hydroptila 357, 381, 382, 384
Hydroptilidae 65, 357, 358, 364, 366, 369, 378, 381–386, 401, 421
Hydrorisssoia 138
Hydroscapha 446, 448
Hydroscaphidae 445, 446, 448, 451, 453
Hydrotilinae 357
Hydrotrephes 341
Hydrous 468
Hydrovatus 446, 458, 459
Hydrovolzia 195
Hydrovolzioidea 194
Hydrozoa 101
Hygrobates 195, 196
Hygrobates (Hygrobates) limi 196
Hygrobatidae 196
Hygrobatoidae 192, 194, 196
Hygrobria 446, 464
Hygrobria davidi 464
Hygrobiidae 446, 448, 450, 454, 464
Hylaeothemis 294
Hymenoptera 198, 206, 518
Hymenoptychis 517
Hymenosomatidae 179, 180, 182
Hyphoporus 446, 459
Hyphovatus 446, 460
Hyphydrus 446, 459
Hypodinarthrum 360, 425, 426
Hypophthalmichthys molitrix 78, 531
Hyrcaninae 355
Hyrcanus 355
Hyridella 159
Hyriidae 149, 154, 155, 159
Hyriopsis 156, 157, 156, 157
Hyrtanella 218, 264, 265, 266, 274
Ibanum 185
Ibisia 507
Ichthyophaga 570
Ictinogomphus 293, 311, 312, 314
Ictinogomphus pertinax 314
Idiocarus 343, 345, 346
Idiocnemis 293
Idionychinae 294
Idionyx 294
Idiophya 294

Organism Index

- Idiopoma* 134
Idiotrepes 341
Ilamelmis 447, 481
Illebdella 125, 126
Illiesonemoura 320, 330
Ilyocoris 345
Ilyodrilus 117
Indaeschna 293
Indiaialis 218, 254, 259
Indobaetis 217, 231, 232
Indocloeon 217, 233
Indocnemis 293
Indocrunoecia 360, 426
Indocypha 292
Indodinarthrum 360, 425, 426
Indolestes 292
Indomolannodes 361, 440, 441
Indonaia 152, 156
Indonaia caerulea 152
Indonemoura 320, 330, 331
Indoniphargus 187
Indoplanorbis exustus 143, 144, 146, 147
Indopseudodon 156
Indostomidae 76
Indothemis 294
Inglethelphusa 185
Insects 197–518
Insects, general biology 197–207
Insulamon 185
Integripalpia 356, 360, 363, 364, 373, 421–444
Inthanopsyche 362
Iravadia 137
Iravadiidae 133, 137
Irmengardia 186
Iron 74, 237, 239, 242, 245
Iron sp. 74, 245
Ironodes 245, 237, 239
Ironopsis 246
Isca 218, 254, 255
Isca purpurea 255
Ischnura 292, 296, 305
Ischnurinae 292
Isobates 352
Isolapotamidae 178, 180, 181, 184, 185
Isolapotomon 185
Isonychia 217, 233–236, 276
Isonychia formosana 235
Isonychia kiangsinensis 235
Isonychiidae 235
Isonychiinae 217
Isoperla 333
Isopoda 58, 98, 186, 187
Isostictidae 293, 299
Ithytrichia 357, 382, 385
Jabitrichia 357, 382
Japonalbia 195
Japonothyas 195
Javalbia 195, 196
Javalbia sunyi 196
Javanita 323, 324, 327
Javanotrichia 357
Javathyas 195
Jellyfish (see *Craspedacusta*)
Jilanzhunyechus 447, 482
Jinhongia 138
Johannsenomyia 498
Johora 185
Jubabaetis 217, 225, 227
Jullienia 138
Jullieniini 58, 139
Kalidasia 324, 328
Kambaitipsyche 359, 397
Kambaitipsychinae 359, 397
Kamimuria 317, 322, 324, 326, 327
Kanpotamon 185
Kantacarus 195
Karomana 362, 442
Kawamuracarus 195
Keralica 102
Kibuenopsychomyia 358, 395
Kiefferulus 504
Kingfishers 570
Kiotina 324, 328
Kirkaldyia 347

Organism Index

- Kisaura* 358, 388, 389
Kitagamia 360
Kizakia 361
Kloosia 503, 504
Kodala 360, 426
Koenikea 195
Kongsbergia 195
Krenopelopia 504
Krenosmittia 504
Kribiocosmus 503, 504
Kryptopterus apogon 79
Kyopsycche 359, 397
Kyphopteryx 333
- Labaunium* 177
Labeo 77, 78, 80, 566
Labeo calbasu 78
Labeo rohita 78
Labiobaeis 217, 233
Labrogomphus 293, 311, 312
Labrundinia 504
Laccobius 446, 466, 468
Laccocorinae 346
Laccocoris 345, 346
Lacconectus 446, 459
Laccophilinae 446, 459
Laccophilus 446, 457, 459
Laccotrephes 341
Lacunopsis 138
Laeliaena 446, 464
Lamellidens 156
Lamelligomphus 293, 311, 312, 313
Lamellogomphus 293
Lamonganotrichia 358, 382
Lamprotula 155, 156, 158
Lampyridae 448, 451, 455, 483
Lanceolaria 156, 157
Languidipes 218, 287, 288
Langur, Nilgiri 570
Lannapsycche 362, 433
Laonome 111, 112
Larcasia 361, 440
Larinae 448, 477, 481
Larnaudia 185
- Larsia* 504
Lathrecista 294
Lathriovelia 354
Lauterborniella 504
Lavigeriinae 140
Leandrites 171
Lebertia 195
Lebertioidea 194, 196
Lectrides 361, 422, 423
Leeches (see *Hirudinea*)
Leiodytes 446, 459
Leiognathidae 76
Leiovirgus 159
Lemna 517
Lemnaceae 517
Lens 156
Lepidodesma 156, 158
Lepidoptera 57, 65, 198, 200, 205, 207, 515–517
Lepidostomatidae 60, 65, 360, 364, 371, 425–429, 441
Lepidostomatinae 360, 425
Lepidothelphusa 185
Lepironia articulata 89
Leptelmis 447, 478, 481
Leptobarbus hoevenii 80
Leptocarpus 165
Leptocella 361
Leptoceridae 65, 361, 364, 370, 421–424
Leptocerinae 361, 370, 421, 423
Leptocerus 362, 422, 423
Leptoconopinae 487, 498, 499
Leptoconops 499
Leptogomphus 293, 312
Leptophlebia 218, 260, 261
Leptophlebiidae 65, 72, 204, 208, 210, 213, 217, 218, 253–264
Leptophlebiinae 218
Leptophlebiodea 217
Leptopodidae 356
Leptopodomorpha 356
Leptopsyche 359, 405, 406, 411
Leptopus 356
Leptotarsus 491, 492

Organism Index

- Lestes* 292, 304
Lestidae 292, 295, 301, 304
Lestinae 292
Lestinoidea 292
Lestoidea 292
Lethaxona 195
Lethocerinae 347
Lethocerus 335, 347, 349
Lethocerus indicus 335, 347
Leuctra 332
Leuctridae 57, 65, 317, 318, 320,
 332, 333
Liaphlus 463
Libellaginidae 292
Libellago 292, 308
Libellula 294
Libellulidae 291, 294–298, 300,
 303, 315, 316
Libellulinae 294, 300
Libelluloidea 294
Liebebiella 217, 219, 222, 223, 227
Limbodessus 446, 459
Limnatis 125, 126, 127
Limnebius 446, 464
Limnephilidae 60, 360, 364, 372,
 438, 439, 442–444
Limnephilinae 360, 372, 443, 444
Limnephilus 361, 444
Limnesia 195, 196
Limnesia volzi 196
Limnesiidae 196
Limnichidae 447, 452, 455, 483
Limnichus 447, 483
Limnius 447, 481
Limnocentropidae 360, 364,
 370, 435–437
Limnocentropus 360, 435–437
Limnognida 100, 102
Limnognididae 102
Limnocomum 102
Limnodrilus 61, 113, 114, 115, 117
Limnodrilus claparedieianus 114
Limnodrilus grandisetosus 114
Limnodrilus hoffmeisteri 61, 114
Limnodrilus silvani 114
Limnodrilus udekemianus 114
Limnogonus 353
Limnomedusae 100, 102
Limnometra 351, 353
Limnoperna 61, 149, 150, 151,
 153, 154, 158
Limnoperna fortunei 61, 151, 154
Limnophila 491, 493
Limnophyes 504
Limnopilos naivanetri 179
Limnoporus 353
Limnoscapha 156
Limnotrephes 341
Limonia 491, 493
Limoniinae 491–493
Limpets 134, 142, 143, 146, 147
Lindeniinae 293
Lineidae 105
Liodesmus 446, 459
Liothelphusa 185
Lipoglossa 357
Lipotes vexillifer 528, 530, 569
Lipsothrix 491, 493
Lithoglyphopsis 138
Littorimus 447, 483
Littorinacea 136
Littorinidae 136
Lobotidae 76
Lobothelphusa 185
Lophopodella 109, 110, 424
Lophopodella carteri 109, 110
Lophopodella pectinatelliformis
 110
Lophopodella stuhlmanni 110
Lophopodidae 109, 110
Lophopus 109
Lophopus sp. 110
Loticana 362
Lottiidae 142
Loxostirus 447, 482
Luciocephalidae 76
Luciola 448, 484
Lumbricidae 115, 117
Lumbriculidae 113, 115, 116
Lumbriculus 113, 114

Organism Index

- Lumbriculus vareigatus* 114
Lundbladia 195
Lutjanidae 76
Lutra lutra 570
Lutra perspicillata 570
Lutra sumatrana 570
Lycastis 111
Lycastopsis 111
Lycosa 190
Lycosidae 189, 190
Lygaeidae 356
Lymnaea 145
Lymnaeidae 65, 143, 145
Lype 358, 394, 395
Lyriothemis 294, 316

Macafertiella 218, 266, 274
Macrobrachium 57, 58, 60, 70, 87,
165, 168, 171–175, 176, 177
Macrobrachium australe 173
Macrobrachium birmanicum 87,
176
Macrobrachium equidens 70, 173
Macrobrachium gracilirostris 173
Macrobrachium hainanense 171,
174, 175, 176
Macrobrachium idae 173
Macrobrachium idella 70
Macrobrachium jaroense 173
Macrobrachium lanchesteri 172
Macrobrachium latidactylus 173
Macrobrachium latimanus 173
Macrobrachium lepidactyloides 173
Macrobrachium mammillodactylus
173
Macrobrachium nipponense 172,
174, 175, 176
Macrobrachium rosenbergii 168,
171, 173
Macrobrachium bariennse 173
Macrodiplax 294
Macroebria 447, 475
Macrogomphus 293, 311
Macromia 294, 314
Macromidia 294, 315

Macromiidae 291, 294, 295, 303,
314, 315
Macromiinae 294, 315
Macronema 408
Macronematinae 359, 363, 369,
405, 406, 408–411, 419
Macronevia 447, 482
Macronychoides 447, 481
Macronychus 447, 481
Macropelopia 504
Macrosaldula 356
Macrostactobia 357, 382, 384
Macrosternum 74, 359, 405, 406,
408, 409, 411, 419, 421
Macrosternum fastosum 74, 406,
419, 421
Macrostomida 104
Macrostomum tuba 104
Mactridae 161
Madeoveliinae 355
Madioxytheria 358
Maesaupsyche 359, 405, 407
Magnilobus 218, 261
Mahseer (see also *Tor* spp.) 2, 81,
565
Mainitia 186
Major carp (see also
Cyprinidae) 78, 91, 531, 533,
537, 539, 564, 565
Malacostraca 97, 98, 161–188
Malaiseanrus 447, 483
Malayopotammon 185
Mallochohelea 498
Mamersella 195
Manaliella 494
Maniconeura 360
Margaritana 158
Margaritanopsis 158
Margaritifera 157, 158
Margariferidae 149, 153, 155,
156, 157, 157, 159
Margarya 134
Marginellidae 142
Marilia 362, 433
Marilia sumatrana 433

- Marthamea* 323
Massepha 517
Mastacembelidae 76
Mastacembelus 77
Mataeopsephus 74, 447, 475
Matrona 309
Matsumuraclaeon 219
Mayflies (see Ephemeroptera)
Mazarredia 510
Megalestes 292, 304
Megalestinae 292
Megalogomphus 293, 311, 312, 313
Megalopidae 76
Megaloptera 65, 198, 200, 205, 207, 512–515
Megaluracarus 195
Megapodagrionidae 292, 295, 301, 305
Megapodagrioninae 292
Megapus 195
Megascolecidae 115
Megistocera 491, 492
Mekhongthelphusa 186
Mekongia 134
Melanameletus 264
Melanocypha 292
Melanoides 130, 135, 140, 141
Melanoides tuberculata 135, 140, 141
Melanoneura 293
Melanopsinae 141
Melanotrichia 358, 395–397
Melanotrichia serica 396, 397
Melitidae 187
Melligomphus 293, 312
Mellomyia 360, 426
Mermithidae 106
Merogomphus 293, 312
Merragata 355
Mescrites 447, 470
Mesogomphus 294, 312
Mesonemoura 320, 330
Mesoperla 324, 328
Mesophylax 361, 444
Mesoplacia 218, 287
Mesopodagrion 292
Mesostoma erhenbergi 104
Mesostoma rostratum 104
Mesovelia 355
Mesoveliidae 338, 355
Mesoveliinae 355
Mesovelioidea 355
Mesyatsia 333
Metadinarthurini 360, 425, 426
Metadixa 505
Metagyriinus 462
Metania 99
Metaphya 294, 316
Metasalda 356
Methles 446, 459
Metoeca 517
Metretopidinae 217
Metretopus 217
Metriconemus 504
Metrobatoides 352
Metrobatopsis 352
Metrocorini 353
Metrocoris 353
Micraphelochenus 346
Micrasema 360, 425, 438
Microbes (see also Bacteria) 48, 56, 64, 579
Microchironomus 504
Microdesmidae 76
Microdonta 159
Microdytes 446, 459
Microeubria 447, 476
Microeubrianax 475
Microgomphus 293, 311, 312
Micromerus 308
Micronecta 349, 350
Micronectinae 350
Microperla 329
Microperlinae 329
Micropsectra 504
Micropterna 361, 444
Microptila 357, 382
Microsporidae 445, 446, 451, 454
Microsporus 446, 448

Organism Index

- Microtendipes* 504
Microtrichia 235, 495
Microtrigonia 294
Microvelia 354
Microveliinae 354
Micruracarus 195
Mindoron 185
Minyphlebia 218, 255
Miratesta 146
Missitrichia 357, 382
Mitten crabs (see *Eriocheir*)
Mixotrepes 341
Mnias 292, 296, 297, 309
Mnias mneme 297, 309
Modellnaia 154, 156
Modiolus 154
Molanna 361, 440, 441
Molannidae 361, 364, 371, 435,
 440
Molannodes 361, 440, 441
Mole crickets (see *Gryllotalpidae*)
Mollusca 65, 95, 129–161
Molophilus 491, 493
Molytinae 448, 450
Monactractides 195
Monochromadora 106
Monodactylidae 76
Monodiamesa 504
Monodiscus 104
Monodontina 156
Monohelea 498
Monohystera 106
Mononchus 106
Monopelopia 504
Monopylephorus limosus 114
Montisimulium 497
Montonepa 341
Morimotoacarus 195
Morindopsis 80
Moroagrion 292
Morops 497
Moropsyche 361, 443
Mortonagrion 292
Moselyella 358
Mosses 495
Moth flies (see *Psychodidae*)
Moths (see *Lepidoptera*)
Mpuga 362, 442
Mugger (see *Crocodylus palustris*)
Mugilidae 76
Mulleriidae (see *Etheriidae*)
Mundamella 195, 196
Mundamella cataphracta 196
Muraenidae 76
Muroglossa 357
Muscidae 486, 490, 508
Musculium 151, 153, 161
Musculum lacustre 151
Mutelacea 159
Mylopharyngodon piceus 531
Myrtaceae 89
Mysorella 136
Myspoleo 357
Mystacides 362, 423, 424
Mystroglossa 357
Mystropha 357
Mystus nemurus 79
Mytilacea 154
Mytilidae 153, 158
Myxobdella 124, 126, 127
Myxocyprinus asiaticus 531
Myxophaga 445, 446
Naboandelus 352
Naididae 112–117
Nais 113, 114, 115, 117
Nais inflata 114, 115
Nais papardalis 114
Namalycastis 111, 112
Nandidae 76
Nanhaiapotamon 178, 181, 184,
 185
Nanhaiapotamon hongkongense
 178, 181
Nannodiplax 294
Nannohelea 498
Nannoniaia 156
Nannophlebia 294
Nannophya 294
Nannophyopsis 294

Organism Index

- Nanocladius* 501, 504
Nasus 156
Nathanella 218, 254, 258, 259, 261
Naucoridae 57, 65, 335, 337, 339,
 342–346, 347
Naucorinae 346
Naucoris 345, 346
Naucoroidea 339
Nautlothelphusa 186
Neallogaster 294, 314
Nectocoris 347
Nematocera 485–507
Nematoda 94, 95, 105–106
Nematomorpha 95, 106–107, 115
Nematopalaemon 164, 171
Nematopsephus 447, 475
Nemboinae 511
Nemertea 95, 105
Nemoron 181, 185
Nemoura 320, 330, 331
Nemouridae 57, 65, 317, 318, 319,
 320, 330, 331, 333
Nemourinae 319, 330
Nemouroidea 317
Neoalardus 354
Neobaetiella 221
Neocaridina 129, 166, 169–171,
 175, 176, 177
Neocaridina serrata 170, 175, 176,
 177
Neochappuisides 195
Neochauiodes 512, 513, 514, 515
Neochauiodes boweringi 513
Neochthebius 464
Neoephemeridae 211, 214, 218,
 265, 288
Neoephemeroidea 218
Neoephemeropsis 214, 218
Neoeuryplax 324, 328
Neofilchneria 334
Neogerris 353
Neohydrocoptus 446, 462
Neohydrophilus 468
Neolepidostoma 360, 426
Neonectes 446, 459
Neoneuromus 512
Neoniphargidae 187
Neopeltoperla 329
Neoperla 321, 323, 324, 326, 327
Neoperlini 326–328
Neoperlops 323, 324, 327, 328
Neophocaena phocaenoides 529
Neophylax 361, 438, 439, 440
Neopodonomus 504
Neopotamanthodes 288
Neopotamanthus 288
Neoptera 198
Neoradina 140
Neorhabdocoeli 104
Neosarmatium 177
Neoschoenobia 517
Neosevermia 360, 426, 427, 429
Neoschoenobia 516
Neotelmatoscopus 505, 506
Neotomasius 355
Neotricula 58, 72, 138, 139, 547
Neotricula aperta 139, 547
Neozavrelia 504
Nepaloptila 357, 378, 379
Nepenthaceae 179
Nepenthes 179, 507
Nephrotoma 491, 492
Nephtyidae 111, 112
Nephrys 111, 112
Nepidae 65, 335, 336, 339, 341,
 342, 345
Nepinae 341, 342
Nepogomphus 293
Nepoidea 339
Nepomorpha 65, 334, 336, 338–
 351
Neosternus 446, 457, 458, 459
Nereidae 111, 112
Nereis 111
Nerevelia 355
Neritaceae 134
Neritidae 132, 134
Nerithilia 134
Neritina 134
Neritodryas 134

Organism Index

- Nerthra* 350
Nesocricos 344, 345, 346
Nesonychus 447, 478, 482
Nesoxenia 294
Neucentropus 359, 397
Neumania 195, 196
Neumania nodosa 196
Neumania supina 196
Neurhermes 512
Neurobasis 292, 297, 309, 310
Neurobasis chinensis 297, 309
Neurocaenis 214, 218
Neurocyta 360, 442
Neuromus 512
Neuroptera 99, 198, 207, 512, 513
Neurothidae 512
Neurothemis 294, 296
Neusterinsifer 354
Nevermannia 497
Newts (see *Tylototriton verrucosus*)
Ngoya 362, 442
Nichollsia menoni 187
Nichollsiidae 187
Nietnerella 362, 422, 423
Nigrobaetis 217, 231
Nihonogomphus 294, 312
Nilobezzia 498
Nilodorum 504
Nilotania 195
Nilotanypus 501, 504
Niphadoles 516
Nipponacarus 197
Nipponeurorthus 512
Nirvana 324, 328
Niuginitrichia 357, 382, 385
Nixe 217, 237, 242, 243, 247, 248, 252
Nogiperla 329
Noguchiphaea 292
Noleca 362
Nonnullidens 218, 258, 261, 262
Nososticta 293
Notacanthurus 217, 237, 240, 243, 252
Notanatolica 362, 423
Notania 361, 443
Noteridae 446, 448–450, 454, 457, 462, 463
Noterus 446, 462
Nothopsyche 361, 444
Notidobia 362, 441
Notonecta 339
Notonectidae 65, 336, 337, 339, 350
Notonectinae 339
Notonectoidea 339
Notoneura 293
Notoplebia 218
Notopteridae 76
Nudomideopsis 197
Nychia 339
Nychogomphus 294
Nymphaea 517
Nymphaeaceae 517
Nymphicula 517
Nymphomyia 495
Nymphomyia holoptica 495
Nymphomyiidae 65, 486, 489, 490, 494, 495
Nymphula 517
Nymphulinae 515–517
Nymphulini 517
Occutanpsyche 359
Ochteridae 338, 350, 351
Ochteroidea 350
Ochterus 350
Ochthebius 446, 464, 465
Ochthopetina 324, 327
Octogomphinae 293
Ocypodidae 179
Odhneripisidium 161
Odonata 59, 63, 65, 70, 72, 73, 197, 198, 199, 206, 291–316
Odontobdella 127
Odontoceridae 65, 362, 364, 372, 433–434
Odontomesa 504
Odontomyia 508
Oeceotrichia 357, 382

Organism Index

- Oecetina* 362
Oecetis 362, 421, 422, 423, 424
Oecetodella 362
Oestropsyche 359, 405, 409, 411
Ohrya 447, 481
Olax 80
Oligoaeschna 293
Oligochaeta 56, 65, 97, 112–118
Oligoneuriella 217, 233, 234, 235
Oligoneuriidae 65, 211, 217, 233–236, 276
Oligoneuriinae 217
Oligoplectrodes 360
Oligostigma 517
Oligotrichia 360
Olindiidae 100
Olyridae 76
Oncomelania 18, 130, 137, 138, 537
Oncomelania hupensis 18, 138
Oncomelania hupensis chiui 137
Oncomelania hupensis fausti 137
Oncomelania hupensis hupensis 137
Oncomelania hupensis tangi 137
Oncorhynchus mykiss 571
Onychargia 292
Onychogomphinae 293
Onychogomphus 294, 311, 312
Onychothemis 294, 295
Onychotrechus 352
Oocylus 446, 468
Oodeia 323, 324
Oopterygia 360, 442
Oosthuizobdella 123, 126
Ophichthidae 76
Ophiogomphus 74, 294, 296, 297, 311, 312
Ophiogomphus sinicus 74, 296, 297, 312
Opisthobranchia 143
Orcaella brevirostris 547, 569
Orchithemis 294
Ordobrevia 447, 481
Orectochilinae 446, 461, 462
Orectochilus 446, 462
Oreochromis 77, 574
Oreochromis mossambicus 574
Oribatida 194
Orientogomphus 294
Orimarga 491, 493
Oriza sativa indica (see also Rice) 53
Ormosia 491, 493
Ornatus 357, 376
Orolestes 292, 304
Ororotsia 217, 237, 238, 252
Orphnelidae (= Thaumaleidae) 506
Orthetrum 294, 296, 316
Orthocladiinae 65, 489, 500, 501, 502, 504
Orthocladius 504
Orthoptera 198, 205, 509–511
Orthosalda 356
Orthotrichia 357, 381, 382, 385
Orthotrichia muscari 381
Orthotrichiella 357, 382
Oryziidae 76, 189
Oryzias curvinotus 189
Osmylidae 512
Osmylus 512
Osphronemidae 76
Osphronemus 78
Osteochilus 78
Osteoglossidae 76, 566
Otter civet 570
Ovitamon 185
Oxus 195
Oxydorptila 357
Oxyethira 357, 381, 382, 386
Oxynaia 156
Oyamia 324
Oziotelphusa 186
Ozobranchidae 126
Ozobranchus 119, 126
Pachychilidae 140
Pachycypha 292
Pachydictyum 99
Pachydrobia 138

Organism Index

- Pachydrobiini 58, 139
Pachyparnus 447, 483
Padangpsyche 358, 394, 395
Paddlefish, Chinese (see *Psephurus gladius*)
Padunia 357, 378, 379
Paduniella 358, 393, 394
Paduniellinae 358
Paeabezzia 498
Paegniodes 74, 217, 237, 240, 243, 250–252
Paegniodes cupulatus 74, 250, 251
Pahamunaya 359, 398, 399
Palaeagapetus 358, 383, 384
Palaemon 164, 171
Palaemonetes 164, 171
Palaemonetes sinensis 171
Palaemonidae (see also Prawns) 58, 65, 162, 163, 168, 171–176, 181
Palaemoninae 171
Palaeodipteron 495
Palaeoptera 198, 199
Palaeothemis 294
Palaiargia 292
Palawanhelphusa 186
Palingenia 218, 285, 286
Palingeniidae 281
Palingeniinae 211, 218, 281, 282, 284, 285, 286
Palpispercheron 195
Palpomyia 498
Palpopleura 294
Palpopleurinae 294
Paludicella articulata 109, 110
Paludicella pentagonalis 110
Paludicellidae 110
Paludinella 139
Paludominae 133, 140
Paludomus 133, 140
Pandanaceae 89
Pandanus helicopus 89
Pangasiidae 76
Pangasius 78, 546, 565, 566
Pangasius (= Pangasianodon) gigas 546, 565
Pangasius jullieni 546
Pangasius krempfi 546
Pangasius siamensis 546
Pantala 294, 296, 297–298, 315, 316
Pantala flavescens 297, 298
Papuagrion 292
Parabedella 123, 124, 126
Parabithynia 136
Paracaridinicola 104
Parachauiodes 512
Parachironomus 504
Paracladopelma 501, 504
Paraclepsis 121, 126
Parachius 509
Paracricotopus 504
Paracrostoma 112, 140
Paracymoriza 517
Paracymus 446, 468
Paradelphomyia 491, 493
Paradinanthrodes 360
Paraethaloptera 359, 405
Parafossarulus 136, 137
Parafossarulus eximus 137
Parafossarulus sinensis 137
Paragnetina 317, 322, 324, 327
Paragomphus 294, 297, 312
Paragomphus capricornis 297
Paragonimus westermani 178
Paragordius 107
Parakiefferiella 504
Paraleptophlebia 218, 260
Paraleuctra 333
Paralimnotrephes 341
Paramacronychus 447, 481
Parameletus 216, 217, 216
Paramerina 504
Parametriocnemus 504
Paramoera 187
Paranaïs 114, 117
Paranaïs frici 114
Paranemobius 511
Paranyctiophylax 359, 397, 398, 399
Paraphlegopteryx 360, 426, 427

Organism Index

- Paraplea* 339, 340
Parapotamon 185
Parapotamophilus 448, 481
Parapoynx (= *Paraponyx*) 516,
 517
Parapoynx diminutatis 517
Paraprososthenia 72, 138
Parapsyche 359, 405, 407
Parasetodes 362, 422
Parastacidae 98, 104, 162, 104,
 162
Parastactobia 357, 382
Paratanytarsus 504
Paratendipes 504
Paratettix 510
Parathelphusa 126, 186
Parathelphusidae 65, 178, 180,
 181, 184, 185, 186
Parathelphusoidea 185
Parathemis 294
Paratrichocladius 504
Paratyta 165, 166, 167, 175, 177
Paratyta curvirostris 177
Parhyale 187
Parhyalella 187
Parreysia 156
Parthenodes 517
Parunio 156
Pasirotrichia 357, 382
Patapsius 356
Patelloplanorbidae 146
Patrus 462
Pectinatella 109, 110
Pectinatella gelatinosa 110
Pectispongilla 99
Pedicia 491, 493
Pelobiidae 464
Pelochares 447, 483
Pelhydrus 446, 466, 468
Peltodytes 446, 457, 463
Peltoperla 328, 329
Peltoperlidae 317, 318, 319, 328–
 329
Peltoperlinae 329
Peltoperlodes 328, 329
Peltoperopsis 328, 329
Peltopteryx 329
Perbrinckia 181, 186
Periaeschna 293
Pericnemis 292
Pericoma 505
Periphyton 47, 49, 51–53, 64, 67,
 89, 90, 131, 138, 143, 474, 477
Perissogomphus 294
Perissoneura 362
Perithelphusa 186
Perittopinæ 354
Perittopus 354
Perivelia 354
Perlestæ 328
Perlidae 57, 65, 317, 318, 320,
 323–328, 329
Perlinae 318, 321, 324–326, 328
Perlini 324
Perlodes 333
Perlodidae 317, 321, 333, 334
Perlodinella 334
Perloidea 317
Peschetius 446, 459
pesut (see *Orcaella brevirostris*)
Petalaeschna 293
Petersula 218, 258, 261
Petroglyphus 136
Pettançylus 147
Phaenandrogomphus 294
Phagocata 103
Phaibulamon 185
Phalacroceræ 491, 493
Phalostethidae 76
Phaneta 137
Phanoperla 321, 326, 327–328
Phanostoma 359
Pharyngobdellida 119
Phasganophora 323
Pherbellia 509
Philarcetus 361, 444
Philippinocoris 344, 345, 346
Philoganga 292, 305–307
Philoganga vetusta 307
Philoganginae 292

Organism Index

- Philopotamidae* 65, 356, 358, 364, 367, 386–389, 390
Philopotaminae 358
Philopotamopsis 390
Philorus 494
Pholadidae 161
Phoridae 486, 507
Phragmites communis 537
Phreodrilidae 115, 116
Phreodrilus 115
Phricotelphusa 185
Phryganaeidae 360, 379, 442–443
Phryganopsyche 360, 437
Phryganopsychidae 360, 372, 437
Phrynovelia 355
Phylactolaemata 109, 110
Phyllodocidae 111
Phyllonera 293
Phyllothemis 294
Phylocentropus 358, 403, 404
Phylostanax 361, 443
Physa (= Physella) acuta 135, 145
Physalis 80
Physastra 146
Physidae (= *Physellidae*) 65, 142, 143, 144, 145
Physunio 156
Pila 132, 135, 136
Pilaria 491, 493
Piliidae (see *Ampullariidae*)
Pilsbryoconcha 156
Piona 195
Pirata 189, 190
Pirata subpiraticus 189
Pisauridae 188–190, 518
Piscicola 126
Piscicolidae 119, 121, 126
Pisidiidae (see *Sphaeriidae*)
Pisidium 151, 153, 160, 161
Pisidium annandalei 151
Pisidium clarkeanum 151
Pitcher plants (see *Nepenthes*)
Placobdelloides 123, 126
Planaeschna 293, 311
Planaria 103, 104
Planaria arborensis 103, 104
Planariidae 103
Planaxidae 142
Planolineus 105
Planorbacea 145–147
Planorbidae 65, 135, 142, 143, 144, 145–146, 147
Platambus 446, 459
Platanista gangetica 89, 568, 569
Platanista minor (= *Patanista indi*) 568, 569
Plattycantha 293
Platybaetis 217, 225, 226, 227
Platycephalidae 76
Platycnemididae 293, 295, 302, 305
Platycnemidinae 293
Platycnemis 293, 305
Platygomphus 293
Platyhelminthes (see also *Trematoda*) 95, 102–105, 146, 178
Platynectes 446, 459
Platysticta 293
Platystictidae 293, 295, 301, 305, 306
Plea 339
Pleciobates 353
Plecoptera 57, 59, 60, 65, 198, 200, 206, 316–334, 501
Plectridae 106
Plectrocenia 359, 397, 398
Plectus 106
Pleidae 65, 335, 337, 339–341
Plethogenesia 218, 281, 284, 285
Plethogenesia papuana 285
Pletholophus 155
Plethotrichia 358, 382
Plethus 358, 382, 385
Pleuroceridae 133, 140
Pleurocerinae 140
Plotosidae 76, 78
Plumatella 107–110, 108, 109
Plumatella casmiana 110
Plumatella emarginata 107, 109, 110

- Plumatella ganapato* 110
Plumatella javanica 107, 110
Plumatella longigemmis 110
Plumatella repens 109
Plumatella vorstmani 110
Plumatellidae 107, 109, 110
Podelmis 447, 481
Podolestes 292
Podonominae 501, 504
Podonychus 447, 482
Podopteryx 292, 305
Podura aquatica 509, 510
Poduridae 509
Poecilobdella 125, 127
Poecilopsyche 362
Poeciloptila 357, 378, 379
Polycanthaginae 293
Polycanthagyna 293, 311
Polycelis 103
Polycentropodidae 65, 359, 368, 392, 397–400, 401, 403
Polycentropodinae 359, 368, 397
Polycentropus 359, 397, 398, 399
Polychaeta 56, 57, 97, 111, 112
Polymera 491, 493
Polymesoda 159
Polymitarcyidae 211, 218, 281, 286, 287–288, 289
Polymitarcynae 218, 287, 289
Polymitarcys 287
Polymorphanisus 74, 359, 405, 409, 410, 411, 419, 420
Polymorphanisus astictus 74, 410, 419, 420, 410, 419, 420
Polynemidae 76
Polypedilum 502, 504
Polyphaga 445, 446, 448, 449, 464–484
Polyplectropus 359, 397, 398
Polyplocia 218, 287
Polypyxis 146
Pomacea canaliculata 136
Pomacentridae 76
Pomatiopsidae 56, 58, 72, 133, 136, 137, 138–139, 547
Pomatiopsinae 138
Pompilidae 518
Pontogeneidae 187
Pontomyia 504
Pontoninae 171
Porifera (see also Sponges) 94, 99
Pornothemis 294
Porpoise, black finless 529
Potamacmaea 142
Potamalpheops 166
Potamanthellus 214, 218, 288
Potamanthidae 62, 211, 218, 281, 288–290
Potamanthidus 218
Potamanthodes 218, 288, 289, 290
Potamanthodes fujianensis 290
Potamanthus 218, 282, 288, 288–290
Potamanthus (*Potamanthodes*) *kwangsiensis* 290
Potamanthus (*Potamanthodes*) *yooni* 289
Potamanthus (*Potamanthus*) *huoshanensis* 290
Potamanthus (*Stygifloris*) *sabahensis* 290
Potamanthus kamonis 289
Potamarcha 294, 316
Potamidae 65, 180, 181, 183, 184, 185
Potamididae 141
Potamiscus 185
Potamocypoda pugila 179
Potamodytes 460
Potamogeton crispus 54
Potamoidea 180, 183, 184, 185
Potamometra 353
Potamometropsis 353
Potamon 185
Potamonectes 460
Potamophilinus 448, 481
Potamophilus 448, 481
Potamyia 359, 405, 416, 417
Potomida 155, 156
Potthastia 504

Organism Index

- Povilla* 218, 287, 288, 289
Praehelichus 447, 483
Prawns (see also Palaemonidae) 57,
 58, 87, 162, 171, 556, 557
Presbytis johnii 570
Pressidens 156
Prionocyphon 447, 470
Pristidae 76
Pristigasteridae 76
Pristina 113, 114, 117
Pristina accuminata 114
Pristinella 117
Probarbus jullieni 79, 563, 565
Probarbus labeamajor 546, 565
Procambrus clarkii 162
Procladius 504
Procloeon 217, 229, 230, 233
Procordulia 294
Prodasineura 293, 305
Prodiamesinae 501, 504
Prohyriopsis 156
Prosobranchia 57, 58, 96, 112,
 129–142, 579
Prosopistoma 215, 216, 218
Prosopistomatidae 65, 210, 214,
 218
Prostoma 105
Protancylus 147
Protanyderus 494
Protanypus 501, 504
Protarcys 334
Protobehningia 209, 213, 218
Protobehningia merga 213
Protohermes 512, 513, 514
Protojaniridae 187
Protonemura 320, 330
Protoneuridae 293, 295, 302,
 305
Protoneurinae 293
Protoptilinae 357, 378, 379
Protorthemis 294
Protosticta 293, 305, 306
Protosticta taipokauensis 306
Protozoa 55
Protunio 156
Protzia 195
Proxiphocentron 358, 395
Psammobiidae 161
Psammogammarus fluviatilis 187
Psammogammarus philippensis 187
Psammonella 217, 233
Psectrocladius 504
Psephenidae 63, 65, 73, 445, 447,
 452, 456, 457, 472–476
Psepheninae 447, 475
Psephenoides 74, 447, 472, 474,
 475
Psephenoides sp. 74, 474
Psephenoidinae 447, 474, 475
Psephurus gladius 531, 532, 564,
 572
Pseudagapetus 357, 378
Pseudagrion 292, 305
Pseudagrioninae 292, 293
Pseudagrionoptera 294
Pseudamophilus 447, 481
Pseudatya 167
Pseudobaphia 155, 156
Pseudobrilla 503, 504
Pseudobythinella 137, 138
Pseudocaenis 275
Pseudocentroptiloides 217, 233
Pseudocloeon 217, 219, 220, 223,
 224
Pseudocloeon kraepelini 219
Pseudodiamesa 501, 504
Pseudodon 156
Pseudodon vondembuschianus 155
Pseudograpsus 177
Pseudograpsus crassus 177
Pseudohalobates 352
Pseudoleptonema 359, 405, 406,
 409, 411
Pseudoligoneuria 234
Pseudolimnophila 491, 493
Pseudomulleria 150, 152, 159
Pseudoneureclipsinae 359, 368, 400
Pseudoneureclipsis 359, 400
Pseudopolydora 111, 112
Pseudosmittia 503, 504

Organism Index

- Pseudostenophylacinae 361, 372, 443
Pseudostenophylax 361, 443, 444
Pseudostenopsyche 389
Pseudostilobezzia 498
Pseudothemis 294
Pseudotrama 294
Pseudovelia 354
Pseudoviripara 136
Pseudoxyethira 358
Pseuduvarus 446, 459
Psilopterna 361, 444
Psilotreta 362, 433, 434
Psilotreta kwangtungensis 434
Psolodemus 292, 310
Psychoda 505
Psychodidae 65, 486, 487, 490, 505, 506
Psychomyia 358, 393–395
Psychomyiella 358, 394, 395
Psychomyiinae 65, 358, 364, 368, 392–395, 398, 403
Psychomyiidae 358, 393, 395
Pteronarcyiidae 317, 318
Pteronarcyoidea 317
Pteronarcys 318
Pterygota 198
Ptilobertia 195
Ptilocolepinae 358, 378, 384
Ptilocolepus 358, 378, 384
Ptilodactylidae 447, 452, 456, 471–472
Ptilomerinae 353
Ptychognathus 177
Ptychognathus demani 177
Ptychognathus riedeli 177
Ptychopteridae 486, 490
Ptychorhynchus 156, 158
Pudaengon 181
Pulmonata 96, 142–147, 181, 348
Puntius 78, 79, 574
Puntius goniatus 574
Pyralidae 57, 65, 207, 515–517
Pyraustidae 515
Pyrophanes 448, 484
Pyrrhosoma 292
Quadrasia 142
Quadricoris 345
Quassia 80
Racemobambos setifera 569
Radiatula 156
Radix 135, 145
Radix plicatulus 135
Rana macrodon 567
Ranatra 341
Ranatrinae 341, 342, 355
Ranguna 185
Raphismia 294
Raptobaetopus 217
Rectidens 156
Regimbartia 446, 468
Rehderiella 138
Rhabdiopteryx 333
Rhabdoblatta 511
Rhabdoceras 361, 429
Rhabdomastix 491, 493
Rhagadotarsinae 352
Rhagadotarsus 352
Rhagovelia 353, 354
Rhagoveliniae 353, 354
Rhantaticus 446, 459
Rhantus 446, 459
Rheocricotopus 504
Rheopelopia 501, 504
Rheotanytarsus 501, 504
Rheumatogonus 353
Rheumatometroides 352
Rhincnoda 511
Rhinagrion 292
Rhinoceros unicornis 571
Rhinoceroses 572
Rhinocypha 292, 297, 308
Rhinocypha perforata 297, 308
Rhinophoracarus 195
Rhionella 218, 264
Rhipidolestes 292
Rhithrogena 217, 237, 239, 242, 243, 246, 250, 252, 253

Organism Index

- Rhithrogena parva* 243
Rhithrogeniella 217, 237, 240, 242, 243, 250
Rhodeinae 156
Rhodischnura 292, 305
Rhodophyta 52
Rhodothemis 294
Rhoenanthodes 214
Rhoenanthopsis 288
Rhoenanthus 218, 282, 289, 290
Rhoenanthus (Anthopotamus) coreanus 289
Rhoenanthus (Anthopotamus) rohdendorfi 289
Rhoenanthus (Potamanthindus) youi 290
Rhoenanthus (Rhoenanthus) speciosus 289
Rhombuniopsis 155, 156
Rhopalonychus 447, 482
Rhopalopsole 332, 333
Rhopalopsole orientalis 333
Rhyacobates 353
Rhyacodrilus 113, 114, 117
Rhyacodrilus riabuschinskii 114
Rhyacodrilus sodalis 114
Rhyacophila 357, 373, 374, 376
Rhyacophila sp. 1 374
Rhyacophila sp. 2 374
Rhyacophilidae 60, 65, 357, 364, 367, 373–376
Rhynchobdellida 118, 121, 126
Rhynchosstegium 495
Rhyothemis 294
Rice 53, 79, 516, 521
Richardsonianidae 120
Ripistes 117
Risiocnemis 293
Risiophlebia 294
Rissoacea 136–139
Rivobates 195
Rivomarginella 142
Rivularia 134
Rivulogammarus 187
Robackia 504
Robertsiella 138
Robinsonia 134
Rotifera 55
Rouxana 186
Rudielmis 447, 482
Rupisalda 356
Sabellidae 111, 112
Sagocoris 345, 346
Salangathelphusa 186
Saldidae 338, 356
Saldoida 356
Saldula 356
Salduncula 356
Salifa 127
Salidae 122, 127
Sandracottus 446, 459
Saranganotrichia 357, 382
Sartoriana 185
Sataria 136
Saussurella 510
Sayamia 186
Scabies 156
Scalmogomphus 294
Scaphula 161
Scaptobdella 127
Scatophagidae 76
Scelimenia 510
Scelotrichia 358, 382, 385
Schepmania 155, 156
Schilbidae 76
Schinostethus 447, 473, 475, 476
Schismatoglottis okadae 569
Schistodesmus 156, 157, 156, 157
Schistoperla 324
Schistosoma spp. (= schistosomes) 18, 146, 537, 547, 571
Schistosoma japonica 18
Schistosoma mansoni 146
Schistosoma mekongi 547, 571
Schizothorax 81
Schmidtiphaea 292
Schoenobius 516, 517
Schomburgk's deer 572
Sciaenidae 76

- Sciomyzidae 486, 509
Sciops 359, 405, 407, 408
Scirpophaga 516
Scirtidae 65, 73, 445, 447, 452, 455, 469–471
Sclerocypha 292
Scleropages formosus 566
Scoliopsis 446, 468
Scombridae 76
Scopura 333
Scopuridae 317, 333
Scorpaenidae 76
Scrobiculariidae 161
Segmentina 144, 146
Segmentina (Polypyxis) succinea 144
Selysioneura 293
Selysiothemis 294
Semblis 360, 442
Semiocladus 504
Semisulcospira 130, 140
Senckenbergia 140
Sendleria 186
Sepedon 509
Septaria 134
Septlebertia 195
Sergestidae 163
Sericostomatidae 362, 372, 435, 438, 439, 441
Sermyla 140
Serpulidae 111
Serranidae 76
Serratella 218, 264, 268, 272, 273, 274
Serromyia 498
Sesarminae 177, 179, 183, 184
Sesarmoides 177
Setodes 362, 421, 422, 423
Setodinella 362, 423
Shad, Reeves' (see *Tenualosa reevesii*)
Shangomyia 503, 504
Shaogomphus 293, 312
Sharks 88, 563
Shore bugs (see Saldidae)
Shore flies (see Ephydriidae)
Shrimps (see also Alpheidae; Atyidae; Palaemonidae) 8, 11, 38, 58, 60, 64, 73, 87, 97, 98, 104, 111, 129, 161, 162–177, 497, 573
Sialidae 512
Sialis 512
Siamopaludina 134
Siamthelphusa 186
Sieboldius 293, 311, 312
Siganidae 76
Sigara 349, 350
Siluridae 76
Simothraulus 218, 260
Simpsonella 156
Simsonia 447, 481
Simuliidae 60, 65, 194, 227, 298, 485, 486, 487, 490, 495–497, 499
Simulum 495–497
Simulum sp. 1–6 (from Hong Kong) 496
Simanodonta 156
Sinhalistes 292
Sinictogomphus 293, 311, 312
Sinobdella 127
Sinogomphus 293, 312, 313
Sinolapotamon 185
Sinolestes 292
Sinomytilus 150, 153, 154
Simonychus 447, 482
Sinoperla 324, 327
Sinopotamidae 184, 185
Sinopotamon 185
Simopsephenus 74, 447, 474, 475
Simopsephenus chinensis 74, 474
Sinotaia 134, 135
Sinotaia quadrata 135
Siphlonisca 217
Siphlonuridae 213, 217
Siphlonurinae 217
Siphlonurus 217
Siphluriscus 216, 217
Siphluriscus chinensis 216
Siphluriscus? davidi 216
Sisoridae 76
Sisyra 512, 513
Sisyra aurorae 512

Organism Index

- Sisyridae* 99, 207, 512, 513
Skobeleva 334
Skwala 334
Slavina 117, 113
Smaragdia 134
Sminthuridae 509, 510
Sminthurides viridis 509, 510
Smittia 504
Snakeheads (see also Channidae) 81
Snapping shrimps (see Alpheidae)
Snow trout 81
Soleidae 76, 564
Solenaia 156, 158
Solenidae 161
Somanniathelphusa 178, 181, 186
Somanniathelphusa zanklon 178, 181
Somatochlora 294
Sopkalia 334
Sortosa 358, 388
Sostea 447, 483
Specaria 117
Speovelia 355
Spercheidae 447, 468, 469
Spercheon 195
Spercheronopsis 195
Spercheus 447, 469
Sphaeridiinae 447, 465
Sphaeriidae 149, 158, 159, 160–161
Sphaerium 153, 158, 160, 161
Sphaerodema 347
Sphaeromatidae 187
Sphaeromias 498
Sphalloplana 103
Spicipalpia 356, 357, 373–386
Spiders (see also Araneae) 518
Spilosmylus 512
Spinadis 242
Spineubria 476
Spionidae 111
Spiralothelphusa 186
Spirogyra 463
Spirosperma 117
Sponges (see also Porifera) 424, 501, 512
Spongilla 198 (see also Sisyridae)
Spongillidae 99, 512
Sprickia 155
Springtails (see Colembolla)
Stactobia 358, 382, 385
Stactobiella 358
Stalocoris 345, 346
Staphylinidae 484
Staphylinoidea 446, 449
Stegothryris 517
Stempellina 504
Stempellinella 504
Stenagrion 292
Stenasellidae 187
Stenasellus 187
Stenelmis 447, 481
Steninae 484
Stenobates 352
Stenobatopsis 352
Stenochironomus 502, 504
Stenomelania 140, 141
Stenopsyche 74, 358, 389–392
Stenopsyche angustata 74, 391, 392
Stenopsyche kodikanalensis 390
Stenopsyche marmorata 392
Stenopsyche ochripennis 390
Stenopsyche siamensis 390
Stenopsychidae 73, 358, 364, 367, 389–392
Stenopsychodes 389
Stenostomum unicolor 104
Stenothyra 137, 139
Stenothyridae 56, 58, 133, 136, 137, 139, 547
Stenoxyethira 357
Stephanella 109
Stephanodrilus 129
Stephensoniana 117
Sternolophus 447, 468
Stictochironomus 504
Stilobezzia 498
Stingrays (see Dasyatidae)
Stolella 109, 110

Organism Index

- Stollela indica* 110
Storks 529
Stratiomyidae 65, 486, 489, 508
Stratospongilla 99
Strepsinoma 517
Strongylovelia 355
Sturgeons 529–533, 537
Stygifloris 218, 288–290
Stygiobates 352
Stygolimnesia 197
Stygomomonia 197
Stygothelphusa 185
Stygothromdidoidea 194
Stylaria 113, 117
Stylodrilus 115
Stylogomphus 293, 312, 313
Styloperla 329, 330
Styloperlidae 317, 318, 320, 328–330
Styloperlinae 329
Stylurus 293, 312, 313
Sublettea 501, 504
Succineidae 143
Sulawesia 218, 259, 261
Sulcatula 156
Sulcospira 140
Sulu 218, 261
Sumatendipes 503, 504
Sumatralbia 195
Sumatranotrichia 357, 382
Sundacypha 292
Sundasalangidae 76
Sundathelphusa 186
Sundathelphusidae 180, 181, 184, 185, 186
Suragina 507
susu (see *Platanista gangetica*)
Symbiocloeon 156, 209, 217, 233
Sympecma 292
Sympecmatinae 292
Sympetrinae 294
Sympetrum 294, 316
Symphitoneuria 362, 422, 423, 424
Symphitoneurina 362, 422
Sympotthastia 504
Synafophora 357
Synagapetus 357, 377, 378, 379
Synagotrichia 358
Synaptonecta 350
Synaptonecta issa 350
Synaptopsyche 359, 405, 415, 421
Synaptura panoides 564
Synbranchidae 76
Syneches 508
Syngnathidae 76
Synlestidae 292, 295, 301, 304
Synlestinae 292
Synthemis 294, 299
Synthemistidae 294, 299
Syrphidae 65, 486, 489, 508
Systellognatha 317
Tabanidae 486, 489, 508
Tabanus 508
Tadpoles 188, 190, 348
Taenionema 333
Taeniopterygidae 317, 319, 333
Tagalopsyche 362, 422, 423
Tagapetus 357
Taia 134
Tamopocoris 345
Tanorus 357, 376, 377
Tanycola 218, 255
Tanycricos 344, 345, 346
Tanyderidae 486, 488, 490, 492, 494
Tanymecosticta 293
Tanypodinae 65, 488, 500, 501, 502, 504
Tanypus 504
Tanysiphon 161
Tanytarsus 502, 504
Tanyvelia 354
Taolestes 303
Taprobanelmis 447, 481
Tarebia 140, 141
Tarsotrechus 352
Tarsovelia 354
Tasmanocaenis 218

Organism Index

- Tatea* 138
Tectidrilus achaetus 114
Teinobasis 292
Telmatodrilus 114
Telmatogetoninae 504
Telmatopelopia 504
Telmatoscopus 505
Telmatotrephes 341
Teloganella 214, 217, 218
Teloganodes 218, 264, 265, 267, 274–275
Telganodinae 214, 218, 264
Telganopsis 218, 264, 272
Temburongpsyche 357, 378, 379
Temnocephala 104
Temnocephalida 104–105
Tenagogonus 353
Teneridrilus 114, 117
Teneridrilus mastix 114
Tenualosa ilisha 564
Tenualosa reevesii 531, 533, 534
Tenualosa thibaudeau 547
Tenuilapotamon 185
Teraponidae 76
Terrapins (see also Turtles) 119, 126
Terrathelphusa 181, 186
Tetracanthagyna 293, 295, 310, 311
Tetragnatha mandibulata 188
Tetragnathidae 188
Tetraodontidae 76
Tetraripis 354
Tetrastrimmatidae 105
Tetrathemis 294
Tetrathemistinae 294
Tetrigidae 198, 510, 511
Tetrix 510
Tetropina 321, 324, 326, 328
Thaksinthelphusa 185
Thalassius 188
Thalassosmittia 503, 504
Thalerosphyrus 217, 237, 240, 242, 243, 246, 250
Thalerosphyrus sinuosus 250
Thaumaleidae 486, 488, 490, 506, 507
Thaumastoptera 491, 493
Thaumelea 507
Theliopsychinae 360, 425
Thelphusula 181, 186
Theromyzon 121, 122, 126
Thiara 135, 140, 141
Thiara scabra 135, 140, 141
Thiaridae 58, 64, 65, 129, 130, 131, 133, 135, 140–141, 154
Thienemanniella 504
Thienemannimyia 504
Tholymis 294, 316
Thraulus 218, 254, 257, 258, 261, 262
Thremmatinae 361, 438
Thysanarthria 447, 465, 468
Tilapia 77, 574
Tilapia rendalu 574
Timasielloides 355
Timasius 355
Timpanoga complex (of Ephemerellidae) 265
Tinodes 358, 392, 394, 395
Tiphotrephes 341
Tipula 491, 492
Tipulidae 65, 486, 487, 490–494
Tipulinae 491, 492
Tipulodina 491, 492
Titanosticta 293
Tobachironomus 503, 504
Tobikera 362
Tobrilus 106
Togoperla 322, 323, 324, 325
Tokyobrilla 503, 504
Tomistomus schlegelii 567, 568
Tor putitora 82
Tor spp. (see also Mahseer) 81
Torix 121, 126
Torleya 218, 264, 268, 269, 272–274
Tornidae 136, 137
Torrenticola 195, 196, 197

Organism Index

- Torrenticola (Allotorrenticola)* 70, 72, 73, 106, 198, 200, 202,
abnormipalpis 196 207, 356–444, 518
Torrenticola (Allotorrenticola) 362, 421, 422, 423
bahtilli 196
Torrenticola (Allotorrenticola) 504
malayensis 196
Torrenticola (Heterotractides) 102–104
orientalis 196
Torrenticola (Monotrichides) 217, 218
circuloides 196
Torrenticola (Monotrichides) 218
minor 196
Torrenticola (Monotrichides) 511
neoapratima 196
Torrenticola (Torrenticola) 214
dentifera 196
Torrenticola (Torrenticola) 58, 130, 137, 138
semisuta 196
Torrenticolidae 138, 139
Tototaia 196
Toxotidae 139
Tramaea 76
Trameinae 294
Trancatelloidea 156
Trapezoideus 136
Travancoriana 316
Trematoda 18, 102, 130, 143, 146, 358, 395
Trentepohlia 178, 537, 571
Trephtomas 491, 493
Trephtomasinae 340, 341
Trepobatinae 341
Trocheta 350
Trotocanthidae 197
Trotocanthidae 127
Trochospongilla 134
Trochotaia 99
Troglindicus 171
Tropocorixa 350
Trout, rainbow 571
'Trout', snow 81
Trypauchenidae 76
Tsukushitrichia 81
Tsushimaicus 358, 395
Tubifex 197
Tubifex 112, 113, 114, 115, 117
Tubifex sp. 114
Tubifex tubifex 114
Tubificidae 56, 113, 114, 115, 116, 117
Turbellaria 117
Turbinicola 95, 102–105
Turtles (see also Terrapins) 136
Tvetenia 556, 567
Tylomelania 140
Tylomicrus 447, 468
Tyloperla 322, 324, 325
Tylopyge 323, 324, 327

Organism Index

- Tylorrhynchus* 111
Tylototriton verrucosus 567
Typhlocaridina 166, 167
Tyriobapta 294

Uchidastygacarus 197
Uenoa 361, 438, 439
Uenodryops 447, 483
Uenoidae 361, 371, 435, 438, 439, 441
Uenoinae 361
Uenotrichia 357
Ugandatrichia 358, 381, 382
Ulmerodes 360, 426
Umborotula 99
Uncinais 113, 117
Unguisaeta 447, 481
Ungulinidae 161
Uniandra 156
Unio 156, 157, 156, 157
Unionacea 149, 154–159
Unionaea 156
Unionetta 156
Unionicola 156, 190, 195
Unionicolidae 156, 190, 196
Unionidae 126, 147–150, 152, 154–160, 190, 209, 233
Uniramia 96, 97, 198
Uracanthella 218, 264, 265, 268, 270, 274
Uracanthella rufa 274
Urnatella 108, 111
Urnatella gracilis 111
Urothemis 294
Urumaelmis 447, 481
Utica 177
Utricularia flexuosa 89
Uvarus 446, 459

Valenciniidae 105
Valleriola 356
Vallisneria 517
Valvataceae 136
Valvatidae 136
Varuna 177, 183, 184

Varuna litterata 177, 184
Varuna yui 177
Varunella 109, 110
Varunella coronifera 110
Varunella indorana 110
Varuninae 183, 184
Vejdovskyella 117
Velesumio 159
Velia 354
Veluidae 335, 336, 338, 351, 353–355
Velunae 354
Velohebria 354
Velunio 156
Velvet bugs (see Hebridae)
Veneridae 161
Ventidiopsis 353
Ventidius 353
Vestalis 292, 310
Victoriella pavida 109
Vietelmis 447, 481
Vietnamella 218, 264, 265, 266, 274
Vietrichia 358, 382
Vietsatax 195
Vigarra 358
Villorita 159, 160
Villorita cyprinoides 160
Virgatanytarsus 504
Virgus 159
Viviparaceae 134
Viviparidae 65, 130, 131, 134, 135

Wallacellum 497
Wallago attu 88, 563
Wandesia 197
Warisia 345
Wasps (see Hymenoptera)
Water beetles (see Coleoptera)
Water boatmen (see Corixidae)
Water buffalo 572
Water hyacinth (see *Eichhornia crassipes*)
Water mites (see Hydrachnida)

Organism Index

- Water skaters (see *Gerridae*)
Waterbugs (see *Belosomatidae*; *Naucoridae*)
Waterfowl (see birds)
Watermeasurers (see *Hydrometridae*)
Waterscorpions (see *Nepidae*)
Wattebledia 136
Westralunio 159
Whirligig beetles (see *Gyrinidae*)
Whitefishes 79, 80
Whitmania 119, 120, 124, 127, 119, 124, 127
Whitmania laevis 120
Wormaldia 358, 388, 389
Wuconchona 138
Xanthagrion 293
Xanthoperla 333
Xenochironomus 501, 504
Xiaomyia 503, 504
Xiphagrion 292
Xiphocentronidae 65, 358, 364, 368, 395–397
Xiphovelia 354
Xylotopus 504
Yamatopsyche 360
Yola 446, 459
Yoraperla 329
Zacco pachycephalus 82
Zaitzevia 448, 481, 482
Zaitzeviania 448
Zavrelia 504
Zavreliella 504
Zavrelimyia 504
Zelanicobdella 126
Zephyropsyche 360, 425
Zhouomyia 503, 504
Zizinia latifoli.i 537
Zooplankton 54, 55, 70, 104, 161, 533, 579, 533
Zygonychinac 294
Zygonyx 74, 294, 295, 296, 297, 298, 315
Zygonyx iris 74, 296–298, 315, 296, 297–298, 315
Zygoptera 65, 198, 200, 206, 291, 292–293, 295, 296, 297, 299, 300, 303–310
Zyxomma 294, 316