

Contents

Preface	ix
Trends in Finnish limnology during 1940–1989 by J. Sarvala	1
WATER AND SOCIETY	
Clean water: a fading resource by R. G. Wetzel	21
Uses, abuses and management of lakes and rivers by B. Moss	31
BACTERIAL AND MICROBIAL PROCESSES	
Extracellular enzymes in a small polyhumic lake: origin, distribution and activities by U. Münster, J. Nurminen, P. Einiö and J. Overbeck	47
Significance of bacterial ectoenzymes in aquatic environments by R. J. Chróst	61
Kinetics of amino acids mineralization by a pond sediment bacterial community by B. Montuelle, P. Kestemont and A. Chalamet	71
Microbial ecology of planktonic filamentous phototrophic bacteria in holomictic freshwater lakes by C. A. Abella and L. J. Garcia-Gil	79
Population dynamics of phototrophic bacteria in three basins of Lake Banyoles (Spain) by L. J. Garcia-Gil and C. A. Abella	87
PHYTOPLANKTON DYNAMICS AND COMMUNITY STRUCTURE	
Estimating photosynthetically available radiation into open and ice-covered freshwater lakes from surface characteristics; a high transmittance case study by S. J. Bolsenga and H. A. Vanderploeg	95
Phosphorus transformations in the epilimnia of small humic forest lakes by R. I. Jones	105
Differential luxury phosphate response of planktonic algae to phosphorus removal by G. Bolier, M. C. J. de Koningh, J. C. Schmale and M. Donze	113
Temporal changes in biomass specific photosynthesis during the summer: regulation by environmental factors and the importance of phytoplankton succession by D. C. Pierson, K. Pettersson and V. Istvanovics	119
Spatial changes of phytoplanktonic size spectra in Lake Biwa by R. Tsuda, M. Kumagai and Y. Kakui	137
Phytoplankton and submerged macrophytes in the aquatic ecosystems of the Danube Delta during the last decade by A. Vădineanu, S. Cristofor and G. Ignat	141
Phytoplankton and zooplankton community structure after nutrient additions to the oligotrophic Lake Hecklan, Sweden by H. Olsson, P. Blomqvist and H. Olofsson	147

PRODUCTIVITY AND ENERGY FLOWS

Respiratory electron transport system (ETS) – activity of the plankton and sediment in Lake Balaton (Hungary) by L. G.-Tóth	157
Population dynamics of <i>Bosmina longirostris</i> (Crustacea: Cladocera) in Lake Kariba, Zimbabwe by H. M. Masundire	167
Plankton ecology in an ice-covered bay of Lake Michigan: utilization of a winter phytoplankton bloom by reproducing copepods by H. A. Vanderploeg, S. J. Bolsenga, G. L. Fahnenstiel, J. R. Liebig and W. S. Gardner .	175
The role of zoobenthos in energy flow in deep, oligotrophic Lake Thingvallavatn, Iceland by C. Lindegaard	185
Life history of <i>Corophium curvispinum</i> G. O. Sars (Crustacea, Amphipoda) living on macrophytes in Lake Balaton by I. B. Muskó	197

FISH AND FISHERIES

Experimental estimation of the food intake of larval vendace (<i>Coregonus albula</i> L.) under field conditions by J. Karjalainen and M. Viljanen	203
Food, growth, habitat, and community interactions of young-of-the-year burbot, <i>Lota lota</i> (Linn.), in a Precambrian Shield lake by R. A. Ryder and J. Pesendorfer	211
The response of burbot (<i>Lota lota</i>) to change in lake trout (<i>Salvelinus namaycush</i>) abundance in Lake Opeongo, Ontario by L. M. Carl	229
Demography of spawning grayling (<i>Thymallus arcticus</i>) in the Beaverlodge River, Alberta by L. M. Carl, D. Walty and D. M. Rimmer	237
An evaluation of the quality of fall-fingerling Atlantic salmon (<i>Salmo salar</i> L.) released to natural lacustrine nursery areas in Newfoundland, Canada by V. A. Pepper, T. Nicholls and N. P. Oliver	249
Trophic state and its implications for natural reproduction of salmonid fish by R. Müller	261
Ecological release in feeding behaviour: the case of bluegills in Japan by M. Azuma	269
Whitefish stocking in acidified lakes: ecological and physiological responses by M. Rask, P. J. Vuorinen, J. Raitaniemi, M. Vuorinen, A. Lappalainen and S. Peuranen	277

INTERACTIONS BETWEEN TROPHIC LEVELS

Can ecological theory be used to improve water quality? by Z. M. Gliwicz	283
Indirect effects of fish community structure on submerged vegetation in shallow, eutrophic lakes: an alternative mechanism by C. Brönmark and S. Weisner	293
Regulation of the development and species dominance of summer phytoplankton in Lake Vesijärvi: predictability of enclosure experiments by J. Keto, J. Horppila and T. Kairesalo	303

Effects of fish density on planktonic communities and water quality in a manipulated forest pond by I. J. Holopainen, W. M. Tonn and C. A. Paszkowski	311
Impacts of bleak (<i>Alburnus alburnus</i>) and roach (<i>Rutilus rutilus</i>) on water quality, sedimentation and internal nutrient loading by J. Horppila and T. Kairesalo	323
MONITORING AND MODELLING	
Lacustrine profundal meiobenthos as an environmental indicator by J. Särkkä	333
Mass balance models for elongated lakes by T. Frisk	341
Transport processes in a sound of a large lake by J. Virta, A.-R. Elo and K. Pulkkinen	351
The benthic boundary layer approach and its application to Lake Päijänne, Finland by T. Huttula	359
Interpretation of mixed sediment profiles by means of a sediment-mixing model and radioactive fallout by P. H. Kansanen and J. Seppälä	371
Evaluation of a model-based method for designing water quality observations by J. Kettunen, H. Sirviö and O. Varis	381
WATER POLLUTION AND WATER MANAGEMENT	
The effects of reduced phosphorus and nitrogen loading on phytoplankton in Mondsee, Austria by M. T. Dokulil and A. Jagsch	389
Changes in water quality in Lake Päijänne following decrease of effluent load from the pulp and paper industry in 1969–1989 by K. E. Granberg	395
Reproductive success of <i>Coregonus</i> species in areas loaded by effluents from paper mills by L. Hakkari and P. Bagge	405
Effects of paper mill effluents on the fish fauna of stony shores of Lake Päijänne by P. Bagge and L. Hakkari	413
The eutrophication of shallow coastal lakes in southwest England – understanding and recommen- dations for restoration, based on palaeolimnology, historical records, and the modelling of changing phosphorus loads by P. E. O’Sullivan	421
The conservation status of athalassic lakes in New South Wales, Australia by B. V. Timms	435
Effects of waterfowl on water quality by G. Gere and S. Andrikovics	445
Organic matter in the River Krutyńia (Masurian Lakeland, Poland) by S. Radwan, R. Kornijów and C. Kowalczyk	449
Effects of forest clear-cutting and soil disturbance on the biology of small forest brooks by A.-L. Holopainen and P. Huttunen	457
The effects of forest clear-cutting and scarification on the water quality of small brooks by M. Ahtiainen	465
Total organochlorine and organobromine in Finnish water courses by P. K. G. Manninen and E. Häsänen	475

Concluding remarks I. Limnology now and in the future	
by R. G. Wetzel	481
Concluding remarks II. A Finnish perspective	
by V. Ilmavirta	487
Subject index	489