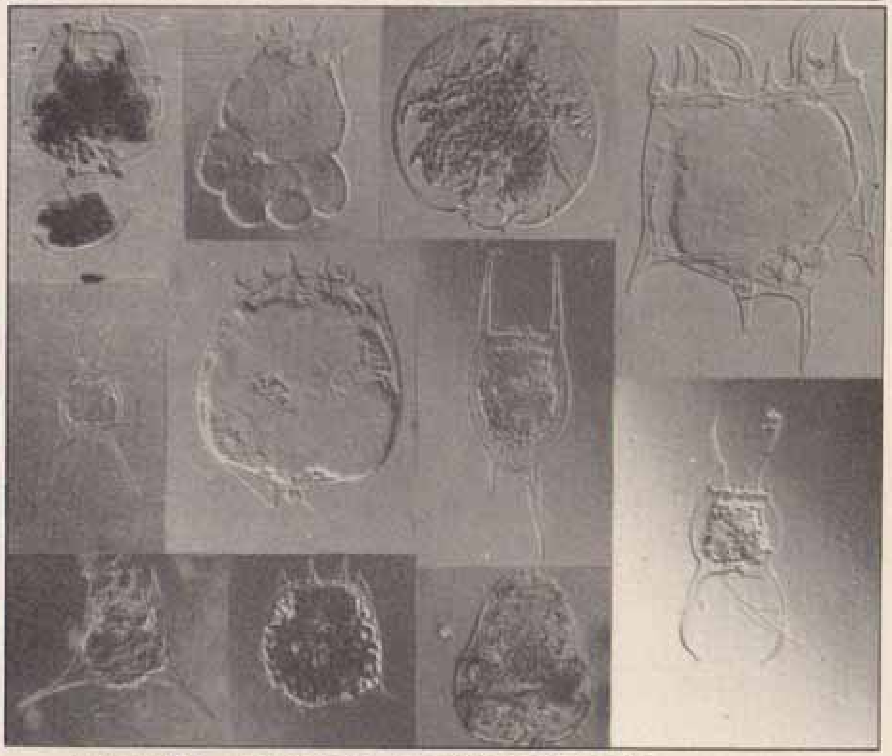
ROTIFER NEWS

A newsletter for rotiferologists throughout the world



ISSUE 22: JANUARY - FEBRUARY 1993

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PRODUCED AT

The Murray-Darling Freshwater Research Centre

Rotifer News is a newsletter for professional and amateur investigators of the Rotifera. The newsletter is not part of the refereed scientific literature (e.g. *Limnol. Oceanogr.*, *Freshw. Biol.*, *Oecologia* etc) and should not be so cited. It is a means of informal communication between widely dispersed workers with a common interest, where news, abstracts, work in progress, requests, recent publications and so on can be advertised or circulated.

Rotifer News is produced at The Murray Darling Freshwater Research Centre once or twice a year, depending on contributions from readers and regional editors. Regional editors are listed below. Back issues of the newsletter are available from Bob Wallace or Russ Shiel on request. Assistance with production and mailing cost is always appreciated!

> If you know of anyone who may wish to receive *Rotifer News* who is not presently on the mailing list, please pass on their address to the nearest regional editor

* * * * * *

Rotifer News contact addresses:

Production Editor: Russ Shiel, Murray-Darling Freshwater Reseach Centre, P.O. Box 921, Albury, N.S.W. 2640, Australia. Ph: 61-60-431002; FAX 61-60-431626.

Regional Editors:
Australasia: as above;

Europe, central: Jenny Schmid-Araya, Biologische Station Lunz, Seehof 4 A3293 Lunz am See, Austria, Ph: 7486-330; FAX 7486-330-31.

Europe, eastern: Jolanta Ejsmont-Karabin, Inst. Ecology, Ul Lesna 13, 11730 Mikolajki, Poland. Ph: 16051;

Europe, western & U.K.: Linda May, Inst. Freshw. Ecol., Inst. Terr. Ecol., Bush Estate, Penicuik, Midlothian EH26 0QB, Scotland. Ph: 031-445-4343; FAX 031 445 3943;
OR
Ros Pontin, 26 Hermitage Woods Cres., St Johns, Woking, GU21 1UE U.K. Ph: 04867-81564;

North America: Bob Wallace, Dept Biology, Ripon College, 300 Seward St, Ripon WI 59471-0248 USA. Ph: 414-748-8122; FAX 414-748-7306; e-mail WALLACER@ACAD.RIPON.EDU

Scandinavia: Peter Andersen, Zoologisk Museum, 2 Dep., Universitetsparken 15, DK2100 Copenhagen, Denmark. Ph: 313-541-11262; FAX 0045-313-98155;

South Africa: Bob Brain, Transvaal Museum, P.O. Box 413, Pretoria, Sth Africa 0001. Ph: 322-7632; FAX 27-12-322-7939;

South America: David Kuczinski, Univ. de Moron, Fac. Ciencias, Cabildo 134, Moron 1708, Buenos Aires, Argentina. Ph: 629-2404 y 6127;
OR
Susana Jose de Paggi, Inst. Nac. de Limnologia, Macia 1933, 3106 Santo Tome, Santa Fe, Argentina. Ph: 70152-70723.

ROTIFER NEWS, ISSUE 22, JAN.-FEB. 1993

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The cover: A collage of billabong rotifers from the Murray-Darling Basin, Australia

Editorial

Many respondees to the Issue **20** questionnaire asked that an updated listing of rotifer workers be produced. A preliminary list was included in Issue **21** as a separate sheet for checking and corrections. The list of names and interests included in this issue are abstracted from the returned questionnaires. Make any amendments you desire on the enclosed postcard and return it. There is also provision for phone, fax, e-mail update. Otherwise, there hasn't been much communication from the membership (*or the regional editors!*) over the six months since Issue **21** - if you want more, you have to communicate!

Harsh economic reality forces me to remind the global membership that *Rotifer News* is produced relatively cheaply at MDFRC - ca. $US1/copy. Mailing is expensive from Australia (ca. $US1.75/copy), so where possible *RN* is bulk mailed to a distributor on each continent. Given that MDFRC provides free paper, photocopying and the cost of a literature search by CSIRO *Search Party*, the requested $US 5/yr subscription is very reasonable. It *can* cover 2 issues if enough people contribute. This has not been the case, however, and the viability of *RN* is doubtful without severe pruning of the mailing list. Cards have been/are being sent out to 'pruned' members, and a reminder is included in this issue. Please return the card if there is any discrepancy between *RN* records and your own, or if you have any specific comments you wish to make.

R.J. Shiel

Rotifer VI: The 1991 Banyoles meeting

We have it on good authority that the proceedings volume from the Banyoles meeting will be out "any minute now". Watch your mailboxes!

Rotifer VII: The 1994 Mikolajki meeting

Postcards sent with Issue **21** have been filtering (slowly) to Jolanta, who advised in Dec. that 45 responses had already been received. Subsequently, the first formal announcement has been sent - if you haven't received the First Announcement, contact Jolanta directly. The Mikolajki meeting will be restricted to 100 participants. To receive the Second Announcement in Sept. 1993 you must have sent the Pre-Registration form back.

For information:

Jolanta Ejsmont-Karabin
Institute of Ecology PAS
Hydrobiological Station
ul Lesna 13, 11-730 Mikolajki
POLAND

Deadlines and key dates

2nd announcement to be mailed	1 Sept. 1993
Submission of abstracts	1 Jan 1994
Payment of registration fee	1 Jan 1994
3rd announcement to participant	1 March 1994
Conference	6-11 June 1994
Submission of manuscripts	8 June 1994
Post-conference field trip	11 June 1994

Questionnaire responses

126 responses have been received from rotiferologists in 30 countries - less than a 50% response rate, but all positive and supportive of the newsletter. Some of your suggestions have been implemented in Issues **21** and **22** - the easiest are those concerning format, indexing the bibliography and members interests, etc. Other suggestions will be facilitated if members advertise the existence and security of circulation of *Rotifer News* - it may be a useful bulletin board for advertisement of places for postgrad. students in rotiferology, for forthcoming meetings other than the triennial rotifer symposia, and so on. We all communicate with a small number of our closer 'rotiferological' colleagues, however the newsletter gives each of us a wider audience. In the interests of closer communication, and at the suggestion of

many of the questionnaire respondees, a postcard is enclosed with this issue for those of you prepared to provide your telephone, fax and e-mail/internet numbers, which were inadvertently omitted from the original questionnaire.

List of respondees and Interests

To save page space, the interests of all respondees to the questionnaire are numbered according to the following key. N/A indicates that interests were not available at the time of printing - please advise in time for the next update of the mailing list. Space is provided on the postcard with this issue.

Keywords for interests:
1: aging, **2:** aquaculture, **3:** bdelloids, **4:** behaviour, **5:** biomanipulation, **6:** community structure, **7:** distribution, **8:** ecology, **9:** evolution, **10:** feeding, **11:** floodplains, **12:** genetics, **13:** indicators, **14:** lakes, **15:** life histories, **16:** interstitial, **17:** littoral, **18:** microbial food web, **19:** physiology, **20:** planktonic interactions, **21:** population dynamics, **22:** predation, **23:** production, **24:** reproduction, **25:** rotifers generally, **26:** SEM, **27:** sessile taxa, **28:** speciation, **29:** streams, **30:** taxonomy, **31:** toxicology, **32:** variation, **33:** water quality, **34:** wastewater treatment, **35:** wetlands, **36:** zoogeography.

ARGENTINA

Andres Boltovskoy
Inst. de Limnologia, "Dr R.A. Ringuelet"
Casilla de Correo 712
1900 La Plata
Interests: **7, 26, 30**

Susana Jose de Paggi
Inst. Nac. de Limnologia
Macia 1933 - 3016 Santo Tome
Santa Fe
Interests: **6, 7, 8, 11, 14, 30, 35, 36.**

David Kuczynski
Universidad de Moron
Facultad de Ciencias Exactas y Naturales
Cabildo 135, 1708 Moron
Buenos Aires
Interests: **6, 7, 8, 30, 36.**

Maria Marinone
La Pampa 3257, 7º Piso, "25"
1428 Buenos Aires.
Interests: **6, 8, 14, 20, 22, 30, 32.**

AUSTRALIA

David Cartwright
Werribee Treatment Complex
Private Bag 10, P.O. Werribee
Vic. 3030
Interests: **21. 33. 34.**

Martin Daintith
Aquaculture Centre, Univ. of Tasmania
PO Box 1214, Launceston
Tas. 7250
Interests: **2, 8, 20.**

Larelle Fabbro
27 Calder St
North Rockhampton
Qld 4701
Interests: **6, 21, 29, 30.**

Stuart Halse
W.A. Wildlife Research Centre
Conservation & Land Management
P.O. Box 51, Wanneroo
W.A. 6065
Interests: **6, 7, 8, 11, 14, 17, 35.**

Brett Ingram
Snobs Creek Fish Hatchery
Private Bag 20, Alexandra
Vic. 3714
Interests: **2, 6.**

Tsuyoshi Kobayashi
Australian Water Technologies
Science & Environment
P.O. Box 73, West Ryde
NSW 2114
Interests: **6, 10, 21, 30.**

Library, Snobs Creek Freshwater Fisheries Research Station
Private Bag 20, Alexandra, Vic. 3714
Interests: **2.**

Joan Powling
PO Box 1036
Ivanhoe, Vic. 3079
Interests: **6, 10, 33.**

Russell Shiel
Murray-Darling Freshwater Research Centre
P.O. Box 921, Albury N.S.W. 2640
Interests: **11, 25, 26, 30, 35, 36.**

AUSTRIA

Hartmut Arndt
Inst. Limnologie Öst. Akad. Wissenschaften
Gaisberg 116, A-5310 Mondsee
Interests: **8, 10, 18, 21.**

Christian Jersabek
Inst. Zool., Univ. Salzburg
Hellbrunnerstr. 34
A-5020 Salzburg
Interests: **6, 8, 30, 36.**

Jenny M. Schmid-Araya
Biologische Stn Lunz
Seehof 4 A-3293 Lunz am See
Interests: **6, 8, 20, 30, 36.**

BELGIUM

Peter Coutteau
Artemia Reference Center
Rozier 44, B-9000 Gent
Interests: **2.**

Henri Dumont
Lab. of Animal Ecology, R.U.G.
K.L. Ledeganckstraat 35
B-9000 Gent
Interests: **8, 25, 30, 36.**

Hendrik Segers
Lab. of Animal Ecology, R.U.G.
K.L. Ledeganckstraat 35
B-9000 Gent
Interests: **26, 30, 36.**

Patrick Sorgeloos
State University of Ghent
Laboratory for Aquaculture & Artemia Reference Center
Rozier 44 B-9000, Ghent
Interests: **2.**

BRASIL

Sigrid Naumann-Leitão
Universidade Federal de Pernambuco
Cent. Tecnol., Dept Oceanog.
Campus Univ. - Cidade Universitaria
50739 - Recife - PE
Interests: n/a

CANADA

Lois Bateman
Department of Biology
Sir Wilfred Grenfell College
Memorial University of Newfoundland
Corner Brook, Newfoundland A2H 6P9
Interests: **3, 8, 30, 35.**

Rama Chengalath
Canadian Museum of Nature
P. O. Box 3443 Station 'D'
Ottawa, Ontario KIP 6P4
Interests: **8, 17, 30.**

Hildegard Enesco
Dept Biology, Concordia University
1455 de Maisonneuve Boulevard West
Montreal, Quebec H3G 1M8
Interests: **1.**

C. H. Fernando
Dept Biology, University of Waterloo
Waterloo, Ontario N2L 3G1
Interests: **7, 25, 36.**

Hugh MacIsaac
Biology Department
University of Windsor, Windsor, Ont. N9B 3P4
Interests: **20, 21, 22.**

Thomas Nogrady
Department of Biology
Queen's University
Kingston, Ontario K7L 3N6
Interests: **6, 19** (neuro-), **30, 35.**

CZECH REPUBLIC
Vladimir Sladecek
Trojanova 13, 120 00 Prague 2
Interests: **33.**

DENMARK
Peter Funch Andersen
Zoologisk Museum 2 Dep.
Universitetsparken 15, DK 2100
Copenhagen
Interests: n/a

EGYPT
Gamal M. Elshebrawy
Zagazig University, Fac. Science
Zoology Department
Interests: **6, 30.**

ESTONIA
Juta Haberman
Limnological Station
Academy of Sciences of Estonia
202454 Rannu
Interests: **6, 23.**

Taavi Virro
Department of Hydrobiology
Institute of Zoology & Botany
21 Vanemuise Street
202400 Tartu
Interests: **15, 21, 30, 32.**

FRANCE
Pierre Clement
Equipe Neuro-Ethologie
Univ. Lyon 1
43 Boulevard du 11 Nov.
F-69622, Villeurbanne Cedex
Interests: **4, 9, 19.**

M.J. Debos, s/co Director
Risponsable of Documentation
Recherche Aquacole
Station de Palavas c/o Ifremer
F-34250 Palavas-les-Flots
Interests: not stated.

A.-J. Francez
C.E.R.E.M.C.A
24, Avenue de Grande-Bretagne
F-63000 Clermont Ferrand
Interests: **6, 14, 29, 35.**

Roger Pourriot
E. N. S. Laboratoire de Zoologie
46 rue d'Ulm
75230 Paris Cedex 05
Interests: **25**

GERMANY
Gregor Fussmann
Inst. Allg. Zoologie
Königin Luise-str 1-3, D-1000 Berlin 33
Interests: n/a

Angelika Hirschfelder
Thiener Str. 23
W-4552 Alfhausen
Interests: n/a

Andreas Hoppe
Hauptstrasse 78
6901 Gaiberg
Interests: n/a

Walter Kleinow
Zoologisches Institut der Universitt
Lehrstuhl Tierphysiologie
Weyertal 119
D-5000 Köln 41
Interests: **19, 26,**

Walter Koste
Ludwig-Brill-Strasse 5
D-4570 Quakenbrück
Interests: **25, 30, 36.**

Ruth Laxhuber
Gundelindenstr. 5
W-8000 München 40
Interests: n/a

Birger Neuhaus
Lichtenwalderstrasse 19
D-3400 Göttingen
Interests: Phylogeny

Dietheim Ronneberger
Inst. fur Gewässerökologie und
Binnenfischerei
Abt. Limnologie Geschichteter Seen
D-(O)-1431 Neuglobsow
Interests: **5, 8, 20, 30.**

Karl Otto Rothhaupt
Max Planck Inst. fur Limnologie
Postfach 165-2320, Plön
Interests:

Norbert Walz
Institut fur Gewässerökol. &
Binnenfisherei
Muggelseedamm 260 O-1162 Berlin
Interests: n/a

INDIA
Sukanta Banik
Dept Life Sciences, Tripura University
Agartala 799-004, Tripura
Interests: **2, 8, 20, 27, 30.**

Nandini Iyer
Dept Zoology
Univ. Delhi, Delhi 110007
Interests: **20, 21.**

Francy Kakkassery
Dept of Zoology, Christ College
Irinjalakuda-680 121, Kerala
Interests: n/a

T. Ramakrishna Rao
Department of Zoology
University of Delhi
Delhi - 110007
Interests: **2, 8, 15, 20, 30.**

S. S. Sarma
Department of Animal Physiology
Madurai Kamaraj University, Madurai
- 625 021
Tamil Nadu State
Interests: **2, 21, 22, 30, 31, 32.**

R. N. Singhal
Department of Zoology
Kurukshetra University
Kurukshetra - 132119
Interests: **8, 10, 21, 30.**

IRELAND
Kennedy Roche
Zoology Dept., U.C.C., Lee Maltings
Prospect Row, Cork
Interests: **6, 10, 13.**

ISRAEL
Esther Lubzens
Israel Oceanographic & Limnological
Research
Tel-Shikmona, P. O. Box 8031, IL-Haifa
31080
Interests: n/a

ITALY
Julio Melone
Dip. Biol., Univ. Milano
Via Celoria 26 I-20121, Milano
Interests: n/a

Claudia Ricci,
Dip. Biol., Sezione Zoologia Scienze
Naturali
Via Celoria 26-20133 Milan
Interests: **3, 12, 15, 24, 30.**

JAPAN
Kazutsugu Hirayama
Faculty of Fisheries, Nagasaki
University
1-14 Bunkyo-machi, Nagasaki-shi 852
Interests: **2, 12, 18.**

Jotaro Urabe
Natural History Museum & Institute
Chiba, Aoba-cho 955-2
Chiba, 260
Interests: n/a

KOREA
Kim, Seok Yee
Dept of Biol. Education, College of
Education
Chonnam National Univ.
Kwangju 500-757
Interests: **8, 29.**

Song, Min Ok
Dept of Molecular Biology
Seoul National University
Seoul 151-742
Interests: **30.**

MEXICO
Roberto Rico-Martinez
Universidad de Guadalajara
Instituto de Limnologia
Apartado Postal 310
45900 Chapala, Jalisco
Interests: n/a

Marcelo Silva-Briano
Univ. Auton. Aguascalientes
Centro Basico
Aguascalientes Ags
Interests: n/a

NETHERLANDS
Library
N.I.O.O., Centre for Limnology
Rijksstraatweg 6
NL-3631 AC Nieuwersluis
Interests: **10, 21.**

Anja Ooms-Wilms
Limnol. Inst. Koninklijke
Rijksstraatweg 6
NL-3631 AC Nieuwersluis
Interests: **10, 21,** nutrient cycling.

J.A. Sinkeldam
Rijksinstituut Voor Natuurbeheer
Kasteel Broekhuizen, Leersum
Interests: **8.**

NEW ZEALAND
Joy Avalon Edwards
Unit 4, 8 Palmerston Street
Hamilton
Interests: **4.**

John D. Green
Dept of Biological Science
Univ. of Waikato, Hamilton
Interests: **6, 14, 20, 22, 35.**

Glenys Kerridge
c/ NZ Dairy Res. Inst.
Effluent Technology Section
Priv. Bag, Palmerston North
Interests: **13, 18, 34.**

Librarian, Freshwater Division
National Institute of Water & Atmospheric Res. Ltd
P. O. Box 8602, Christchurch
Interests: Research library.

Phil Parr
13 Kinross St, Levin
Interests: **6, 8, 21, 30.**

Vida M. Stout
Department of Zoology
University of Canterbury
Box 4800 Christchurch
Interests: **6, 8, 14.**

NORWAY

Knut Yngve Børsheim
Univ. of Trondheim
Lab. of Biotechnology,
N-7034 Trondheim
Interests: **10, 18.**

Anne Lyche
Department of Limnology
Box 1027 Blindern, 0315 Oslo 3
Interests: **10, 20, 22,** nutrient cycling.

POLAND

Irena Bielanska-Grajner
Katedra Ecologii
Uniwersytet Slaski
ul. Bankowa 9, 40-007 Katowice
Interests: **6, 8, 30.**

Jolanta Ejsmont-Karabin
Polish Academy of Science
Institute of Ecology,
ul. Lesna 13 P-11-731,
Mikolajki
Interests: **6, 8, 14, 18, 29.**

Katarzyna Janiec
Dept of Antarctic Biology
Zwirki Iwioury 97199, Pan. C
02 097 Warsaw
Interests: **36** (Polar)

Roman Zurek
Polish Academy of Sciences
Institute of Fresh Water Biology
Slawkowska 17, Krakow 31-016
Interests: n/a

PORTUGAL

Antonio P. Carvalho
Inst. de Zoologia, Fac. Ciencias
Universidad do Porto
Pr. Gomes Teixiera, 4000 Porto
Interests: **2.**

RUSSIA

Galina Galkovskaya
Institute of Zoology
Academie of Sciences of BSSR
Academytekeskaya 27
Minsk 220072
Interests: n/a

Alexander K. Gorbunov
Astrakhan Biosphere Reserve
Naberegnaja Tsarev Reserve, 119
Astrakhan. 414000
Interests: **6, 8,** epidemiology

Ludmilla A. Kutikova
Zoological Institute RAS
Saint Petersburg 199034
Interests: **8, 25, 27, 30.**

Irena V. Telesh
Zoological Institute
Russian Academy Sciences
St Petersburg 199034
Interests: **6, 8, 18, 20.**

Sergey F. Timofeev
Y. Sedov St 22-21
Murmansk 183075
Interests: n/a

SOUTH AFRICA

C. K. Brain
Transvaal Museum, P. O. Box 413
Pretoria 0001
Interests: **8, 29.**

SPAIN

Maria Jose Carmona
Ecologia, Fac. Biologicas
Dr Moliner 50
E-46100 Burjassot
Interests: **15, 24, 31, 32.**

Jordi de Manuel
Dept Ecologia, Fac. Biologia
Univ. Barcelona, Av. Diagonal 645
Barcelona
Interests: **6, 7, 8, 11, 14, 17, 21, 30, 36.**

Maria Rosa Miracle
Ecologia, Fac. Ciencias Biologicas
Univ. de Valencia
46100 Burjassot (Valencia)
Interests: **6, 7, 12, 14** (stratified),

Manuel Serra
Dept Ecologia, Fac. Cienc. Biologicas
Univ. de Valencia
E-46100 Burjassot
Interests: **15, 31, 32.**

Julia Toja Santillana
Dept Ecologia
Univ. Sevilla
Apdo 1095, 41080 Sevilla
Interests: n/a

SWEDEN

Birger Pejler
Institute of Limnology
Box 557,S-751 22 Uppsala
Interests: **7, 8, 17.**

THAILAND

La-orsri Sanoamuang
Department of Biology
Khon Kaen University
Khon Kaen 40002
Interests: **6, 7, 8, 26, 30, 32, 36.**

U.K.

Acquisitions Section DLS
The Natural History Museum
Cromwell Road, London, SW7 5BD
Interests: Reference library.

Herbert Dartnall
Copper Beeches, 76 Lewes Rd
Ditchling, Sussex, BN6 8TH
Interests: **36** (Polar).

Alison Fulcher
Department of Biological Sciences
Univ. of Lancaster
Lancaster LA1 4YQ
Interests: **8, 19, 14.**

James Green
17 King Edward Gve
Teddington, Middx. TW11 9LY
Interests: **7, 8, 25, 30, 32, 36.**

Eric D. Hollowday
45 Manor Road, Aylesbury
Bucks HP20 1JB
Interests: **30, 36.**

Charles G. Hussey
Department of Zoology
British Museum of Natural History
Cromwell Road, London SW7 5BD
Interests: **25, 30.**

IFE Library
Winderere Laboratory
The Ferry House
Ambleside, Cumbria LA22 0LP
Interests: n/a

John Langley
Middlesex Polytechnic
Bramley Rd
London N14 4XS
Interests: n/a

Linda May
Institute of Freshwater Ecology
Bush Estate, Penicuik
GB-Midlothian EH26 0QB
Interests: n/a

William Whiteley
Midway, Chapel Mill
Truro, Cornwall TR1 3BP
Interests: **7, 30.**

Rosalind M. Pontin
26 Hermitage Woods Crescent
St. Johns, Woking, Surrey GU21 1UE
Interests: **6, 7, 11, 13, 15, 17.**

USA

C. William Birky Jr
Dept of Molecular Genetics
Ohio State University
484 West Twelfth Ave
Columbus OH 43210-1292
Interests: **9, 24.**

Robert Black
Department of Biology, Cornell College
Mount Vernon IA 52314
Interests: n/a

W. T. Edmondson
Department of Zoology
NJ-15, Univ. of Washington
Seattle WA 98195
Interests: **8, 14, 17, 20, 26.**

D. A. Egloff
Department of Biology
Oberlin College, Oberlin OH 44074
Interests: **4, 8, 20.**

Anna Helen Gallagher
5255 La Hermosa Avenue
La Jolla CA 92037
Interests: **25.**

John J. Gallagher Collection
Curator in Charge
Section of Invertebrate Zool.
The Carnegie Museum of Natural History
4400 Forbes Avenue Pittsburgh, PA 15213
Interests: **25** (literature collection).

John J. Gilbert
Department of Biological Sciences
Dartmouth College Hanover NH 03755
Interests: **10, 18, 22.**

Nevin E. Grossnickle
UW-Marathon Center
Wausau, WI 54401
Interests: n/a

Karl Havens
Kent State University
Dept. of Biological Sciences
Kent, Ohio 44242-0001
Interests: n/a

David G. Jenkins
Salisbury State University
Department of Biological Sciences
Salisbury MD 21801-6837
Interests: **17, 20, 29.**

Charles E. King
Department of Zoology
Oregon State University
Corvallis, OR 97331-2914
Interests: **12.**

Kevin L. Kirk
Department of Biology
New Mexico Tech
Socorro, NM 87801
Interests: **8, 19, 21, 31.**

John Korstad
Dept. of Biology, Oral Roberts University
Tulsa, OK 74171, USA
Interests: **2, 10, 15.**

Matthew Meselson
Dept. of Biochemistry and Molecular Biology
Harvard University, 7 Divinity Avenue
Cambridge, MA 02138
Interests: **12.**

Robert Otis
Psychology Department, Ripon College
300 Seward Street, Ripon, WI 54971-0248
Interests: n/a

Parke A. Rublee
Biology Department
University of North Carolina
Greensboro, NC 27412
Interests: **8, 12, 18, 20.**

James F. Saunders III
Department E.P.O. Biology
University of Colorado, Boulder CO 80309-0334
Interests: **21, 23.**

Terry W. Snell
School of Biology
Georgia Institute of Technology
Atlanta, GA 30332-0230
Interests: **12, 19, 28, 31.**

Howard L. Taylor
1812 Wood Hollow Court
Sarasota, FL 34235
Interests: **6, 30,** instrumentation photographic record.

Paul N. Turner
1110 N. West St
Rose Hill, KS 67133
Interests: **6, 16, 25, 30, 32, 36.**

James E. Vancil
Dept. of Natural Sciences and Math.
Texas College, Tyler
TX 75702
Interests: n/a

R. L. Wallace
Biology Department, Ripon College
300 Seward Street, Ripon
WI 54971-0248
Interests: **8, 15, 26, 30.**

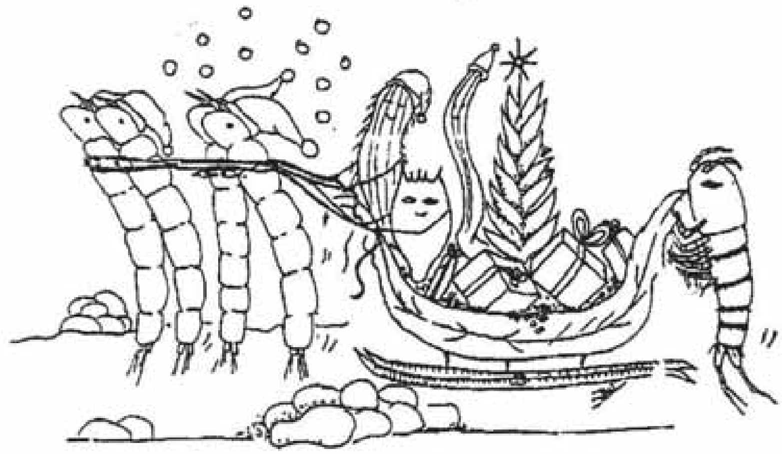
Liz Walsh
Department of Biological Sciences
University of Nevada, Las Vegas NV 89154-4004
Interests: **12, 21, 30.**

Robert G. Wetzel
Department of Biology
University of Alabama
Tuscaloosa AL 35487-0344
Interests: **8, 17, 27.**

Elizabeth Wurdak
Department of Biology
Saint John's University
Collegeville MN 56321
Interests: **6, 8, 10, 20, 21, 26.**

VENEZUELA

Carlos Lopez
Dept de Biologia, Fac. Exp. de Ciencias
Universidad de Zulia, Apdo 526
Maracaibo 4011-A
Interests: **6, 20, 21, 23, 30.**



All you artists out there with a a rotiferological talent.......send some examples of your artwork to Rotifer News for our front cover.......become international......otherwise you'll get marsupial rotifers..........!

News, Notes and Requests

A summary of communications from global rotifer workers. Please communicate anything of interest - methods, work in progress, requests for material, literature, etc. Help to make this a **Newsletter.**

[Contributors are warned that submitted text may be Anglicized (or more correctly Australized!) during conversion into RN format. While the views expressed remain those of the contributor, any typos or other errors should be blamed on the production editor. - Ed.]

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1. Rotiferology in Estonia

(Toovi Virro)

Rotiferology in Estonia has its roots not in the remote past. The first data about the Estonian rotifers date back to the beginnings of this century. In 1906-13 N.A. Samsonov, then lecturing at University of Tartu (Dorpat) published a series of articles on the zooplankton of some local lakes. In these papers he dealt with rotifers, gave lists of the rotifer taxa found, and brief illustrated descriptions of several taxa. At the same time, two other Estonian lakes were studied by G. Schneider, a visiting professor from Riga (Latvia). In the identification of zooplankton species, K.M. Levander from Helsinki (Finland) assisted him. In the papers, published in 1908-20, some twenty rotifer taxa from both those lakes were recorded. Thus, in Estonia, rotiferology originated from general zooplanktonology, being its undifferentiated branch.

The very first specific rotifer studies were published in 1926 and 1933 by Heinrich Riikoja, professor of zoology at Tartu University. These studies were based on collections from the brackish-water Bay of Matsalu on the western coast of Estonia. In addition to the faunistic review, the decriptions of two new species, *Lecane* (s.str.) *matsaluensis* and *Macrochaetus esthonicus*, were given*. Thus local rotiferology was raised to a new level, and rotifers became recognized as independent research objects.

Together with systematic and extensive studies of zooplankton, which started after the foundation of the Limnological Station of Lake Võrtsjärv (LSV) in 1954, more data about rotifers began to accumulate. Although the main interests were concentrated on zooplankton as a whole, there also appeared a great number of papers dealing with the pelagic rotifer complex, mainly published by Juta Haberman and Aare Mäemets (LSV). J. Haberman, a zooplanktonologist by specialty, has contributed a lot to the

advancement of Estonian rotiferology. She invited Ludmila A. Kutikova, the well-known rotifer systematist of the Institute of Zoology of St Petersburg, Russia, to participate in and consult onlocal rotifer studies. Since the 1970's L.A. Kutikova has visited the LSV frequently, giving invaluable taxonomic assistance. This co-operation resulted in several interesting papers. For example, a new species, supposedly endemic *Ploesoma peipsiense* was described by Maemets & Kutikova (1979) from J. Haberman's samples collected in Lake Peipsi.

By the beginning of the 1980's, the need for Estonia's own rotifer specialists had become evident. J. Haberman enthusiatically undertook the mission of preparing a new generation of researchers. She selected a suitable student (T. Virro) who was interested in this field, and organized his education. L.A. Kutikova, who already was familiar with the local rotifer situation, agreed to teach and supervise the student. Under the friendly guidance of these two ladies, T. Virro made his first steps in the field of rotiferology, and is now carrying on the study of Estonian rotifers.

The Estonian rotifer fauna is relatively insufficiently studied. So far, 244 rotifer species (300 taxa) have been recorded, which is very few in comparison with the better-researched neighbouring regions. We must admit that existing information about local rotifers is somewhat one-sided, as it is based mainly on lake studies. Other water bodies (rivers, ponds, springs, bays, etc) to say nothing of more exotic habitats (e.g. moist sand, lichens, etc) are practically uninvestigated for rotifers. Most studies dealing with rotifers have been ecological, focussed on their number, biomass, production, and role in zooplankton, normally including faunistic data. Taxonomic works are rare, and there are not any experimental studies yet.

The main hydrobiological research centre is the Limnological Station at Lake Võrtsjärv, but also Tartu University. The two largest lakes, Lake Võrtsjärv (area 270 km^2) and Lake Peipsi (3555 km^2 of which 1548 km^2 belongs to Estonia) are the most intensively studied water-bodies in Estonia, both hydrobiologically and rotiferologically.

*The descriptions of the above-mentioned new species are given in:

Riikoja, H. 1926. Matsalu lahe ja selle lähema ümbruse keriliste nimestik ühes iligi *Macrochaetus estonicus* kirjeldusega. (A list of the Rotatoria of the Bay of Matsal with the description of a new species *MAcrochaetus esthonicus*). *Loodusuurijate Seltsi Aruanded* **32**, 1-12 (In Estonian).

Riikoja, H. 1933. Contributions to the rotifer fauna of Estonia with the description of a new species *Lecane matsaluensis*. *Anmed Eesti ala järvede uurimiseka* **17**, 1-7.

Maemets, A. & L. Kutikova, 1979. A new rotifer *ploesoma peipiense* sp. nov. in Lake Peipsi. *Proc. Acad. Sci. Estonian SSR, Biology* **28**, 98-101.

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2. A short history of Rotiferology in Russia

(Irena Telesh)

Rotiferology in Russia is half a century older than in Australia (see *RN* **20**). The first data on 15 species of rotifers in Russia was published by S. Kutorga in 1839. In 1840-1860 E. Eichwald and I.F. Weisse studied about a hundred rotifer species in the water basins of the Baltic countries and St Petersburg environs. Later, the faunistic research of P. Stepanov (1885, 1886), A.N. Kortchagin (1888), F.F. Kavrajsky (1888), M. Ruzsky (1889), D.M. Rossinsky (1892) provided data on the fauna of rotifers from the environs of Khar'kov, Moscow and Kazan. Embryological studies of rotifers started also in the 70-80's of the 19th Century (Salensky 1872, 1873; Perreyaslavtseva 1884).. Of great importance was the work of A.S. Skorikov (1896), who described 139 species of rotifers. Skorikov considered this group of aquatic organisms to play an important role in the biological processes in natural waters. Based on rotifers, he elucidated the problems of potamoplankton structure and treatment of polluted and waste waters.

A.S. Skorikov worked at a time of great interest in freshwater fauna, on plankton in particular, and on rotifers that are often so numerous in plankton. Valuable data on the rotifer fauna of Russia were collected by authors such as N. Yu. Zograff (1895, 1900), V.P. Zykov (1900-1908), V.I. Meissner (1901-1913), S.A. Zernov (1900-1903), N.V. Voronkov (1905-1917) and others. By 1916 the total number of publications dealing with rotifers was 250. Summarizing these data, N.V. Voronkov proposed a new theory of zonal geographical distribution of rotifers.

In the 1920-30's most of the experiments with environmental factors influencing rotifers were carried out (Rumyantsev 1922, 1923; Skadovsky & Shreder 1925; Yatsenko 1925; Tausson 1923-1926; Zavadovsky 1916; Bogoslovsky 1925, 1929; Rezvoy 1926). These were the years when our outstanding scientists N.N. Faddejev, N.S. Smirnov, E.S. Neisvestnova-Zhadina, S.D. Murajevsky, A.S. Bogoslovsky, D.A. Tarnogradsky, A.L. Bening, V.M. Rylov and N.K. Deksbah became interested in rotifers.

During the late 1930's the number of special publications on rotifers decreased. Almost nothing was done in Rotiferology during this decade, except some faunistic investigations in Kalinin Province, in the Caucasus and Middle Asia, the results of V.I. Olifan and M.S. Vladimirova (1937) on the variability of rotifers, and the experiments of G.G. Winberg (1937) on rotifer physiology.

In the 1940's rotifer studies were only a part of regular plankton research. Nevertheless, the publications of S.D. Muravejsky (1947) and E.S. Neisvestnova-Zhadina (1949) were of exceptional importance. They were the first Russian generalizations on morphology, systematics and ecology of rotifers, though lacking descriptions of species and keys for their identification.

In the 50-60's, Russian rotiferologists started to investigate biology and productivity of rotifers, raising rotifers for use in aquaculture (Erman 1956-1963; Galkovskaya 1963-1965; Maksimova 1968). Since the early 1950's to the present L.A. Kutikova has been active in rotiferology. Her guide-book *Rotifers of the USSR Fauna* (1970) contains data on 912 species and 262 varieties of rotifers from Russia and neighbouring countries. It is foreworded by a review of previous rotifer research and a thorough analysis of morphology, development, ecology and distribution of rotifers. In addition to intensive investigation of the fauna, phylogeny and evolution, as well as some aspects of biology of rotifers, L.A. Kutikova enthusiastically initiated, organized and participated in three symposia on Rotiferology in Russia.

The first meeting of Russian rotiferologists was held in 1963, in the Moscow State University, under the guidance of A.S. Bogoslovsky. Twelve hydrobiologists and zoologists from eight institutions presented nine communications, and emphasized prospective trends for future rotifer research, such as: studies of biology, growth and productivity of rotifers under different environmental conditions, and interactions of rotifers with other planktonic organisms.

The II All-Union Rotifer Symposium (1983) took place in the Zoological Institute, Russian Academy of Sciences, in St Petersburg (Leningrad). 75 participants from 31 institutions gave 34 presentations. It was already 10 years ago that G.I. Markevich applied new methods which allowed him to interpret the origin and the main trends of adaptive evolution of rotifers. Problems of ecology and systematics of rotifers in different regions of our country were discussed at the symposium by A.A. Kosova, E.N. Ovander, I.V. Arov, N.I. Basharova, L.K. Matveeva, Yu. S. Chuykov, Yu.H. Haberman, M.L. Pidgayko, O.M. Khozhova, and others. Results of eco-physiological envestigations of rotifers were presented by G.A. Galkovskaya and her group. V.E. Kokova and N.I. Spitskaya spoke about the problems of continuous culture of *Brachionus plicatilis*. Rotifers as indicators of water quality were considered by P.A. Tsymdin and others.

The III All-Union Rotifer Symposium was held in the Institute of the Biology of Inland Waters (Borok) in 1989. 33 participants from 20 institutes attended the Symposium, giving 37 presentations. The role of rotifers in the ecosystems, and interactions of rotifers with other aquatic organisms, were demonstrated by V.N. Evdokimov, I.V. Telesh, L.K. Matveeva, A.K. Gorbunov. A.I. Zarubov delivered data on ecological aspects of geographical distribution of bdelloids. Reproduction and development of rotifers in natural and experimental conditions were discussed by A.M. Morozov, E.A. Mnatsakanova, Yu.G. Simakov. Use of scanning electron microscopy allowed G.I. Markevich and E.A. Koreneva to find new approaches in systematics and taxonomy of rotifers. Comparative morphological analysis of the fine structure of trophi has led G.I. Markevich to revise the position of rotifers in the worm system. The Symposium decided that it would be of great use to orgaize a collection of mastaxes which could become the basis for the Russian fundamental collection of electron-microscopical samples available to all the taxonomists. For more information, contact G.I. Markevich.

At present, rotifer research in Russia is carried out rather intensively. L.A. Kutikova and G.I. Markevich brought systematics of rotifers to a new methodological level. I.V. Telesh started experimental research of trophic interactions between rotifers and crustaceans. New data have been obtained on commensal rotifers (E.G. Boshko) and on parasitic invasion as a limiting factor for population growth in many rotifer species (A.K. Gorbunov & A.A. Kosova). Nevertheless, much is left to be done. For instance more attention should be paid to the problems of embryology, genetics, histological peculiarities and anabiosis of rotifers.

This is, very briefly, the history of Rotiferology in Russia. I am sorry to have no possibility to mention here all the specialists (more than 200 names) who have been engaged in rotifer research in our country in the course of the last 150 years. And I hope that Rotiferology in Russia will have not only its history, but the future as well.

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3. A new record of Adineta from Antarctica

(Bob Brain, Transvaal Museum
Pretoria, South Africa)

South Africa has operated an Antarctic base , SANAE, sincce 1960, but, until recently, has not done biological work on the Antarctic continent itself. However, a new South African Biological Antarctic Research Subprogramme has recently been launched, under the guidance of Prof. Roy Siegfried, Director of the Percy FitzPatrick Institute of African Ornithology at the University of Cape Town. It is concentrating on a series of rock outcrops protruding through the snow and ice, about 145 km south of the SANAE base in western Dronning Maud Land, known as the Robertskollen group of nunataks.

A two-person team from the FitzPatrick Institute, led by P.G. Ryan, visited this locality in the austral summer of 1987/88. They established that about 600 pairs of snow petrels, *Pagodroma nivea*, nest at three of the largest nunataks in the group, flying over 100 km to the open sea each time they need to feed. It is these birds that introduce the nutrients to these nunataks which form the base of a simple ecosystem. A preliminary survey showed that these extremely isolated habitats support four species of mosses, 20 lichens, 18 algae and cyanobacteria, 12 soil fungi, five tardigrade taxa, 10 soil ciliates and three species of mites, while the presence of nematodes and rotifers was noted (Cooper *et al.* 1991).

Through the help of the project's microbiologist, Jean Harris, I was able to obtain some dried samples of the moss from the nunataks and re-hydrated them in search of rotifers. To begin with, I had little success, but finally a few bdelloids appeared, which however did not live long at South African room temperature. It was possible to examine and photograph them and to make a preliminary identification of *Adineta gracilis*. Jean Harris will shortly be collecting further samples which will be kept in the fridge and which I will rehydrate at a lower temperature than the first time.

According to the overview of Antarctic rotifers by Dartnall & Hollowday (1985), four species of *Adineta* (*A. barbata*, *A. gracilis*, *A. grandis* and *A. vaga*) are known from the McMurdo Sound area of Antarctica, together with nine representatives of other bdelloid taxa. Despite its low temperatures, Antarctica is clearly something of a bdelloid haven.

References

Cooper, J. *et al.* 1991. Effects of ornithogenic products on ecosystem structure and function: a new South African Biological Antarctic Research Subprogramme. *Sth Afr. J. Sci.* **87**, 223-226.

Dartnall, H.J.G. & E.D. Hollowday, 1985. Antarctic rotifers. *Brit. Antarct. Surv. Sci. Repts* **100**, 1-46.

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4. The Donner, Frey, Gallagher, Ruttner-Kolisko reprint collections

We have all experienced frustrations in finding a particular reference, particularly to some of the older literature. Fortunately, the rotifer-related reprint collections of Josef Donner, David Frey, John Gallagher and Agnes Ruttner-Kolisko have found good homes, and are accessible (conditionally) to interested rotifer workers. The nature of the collections and the conditions are summarised below.

a. *Josef Donner*'s reprints, extensive unpublished notes and drawings are housed at the University of Salzburg, Austria, due to the efforts of Prof. Dr. Hans Adam. The full bibliography is available electronically, indexed by author or subject, as an ASCII or WordPerfect file if a formatted high-density diskette is sent to: Christian Jersabek, Institute of Zoology, Univ. of Salzburg, Hellbrunnerstr. 34, A-5020 Salzburg, AUSTRIA. Christian advises that requests for copies may be met only exceptionally, if the desired paper is not available with an international loan request form, and at a prepaid charge (Jan. 1993) of 1 OS (ca. US 0.09c) per 2 pages (1 copy). Contact Christian for more information.

b. *David G. Frey* (Indiana University). Last issue of *Rotifer News* included notice of donation of the Frey rotifer-related papers to Russ Shiel at the Murray-Darling Freshwater Research Centre. Most of the early U.S. workers, Jennings, Harring & Myers, etc. are included. The Frey/Shiel collection now includes ca. 5000 reprints. Contact MDFRC (address inside front cover) for details. Electronic listing available if diskette provided (specify format). Copies available at $A0.10c/double-sided page.

c. *John J. Gallagher* (U.S.A.): his extensive collection is housed in Pittsburg, PN, U.S.A. An impending publication, "A bibliography and species citation for world literature on the rotifers in the Gallagher Collection" by J.J. Gallagher, J.E. Rawlins and A.H. Gallagher is due early 1993. Contact John E. Rawlins, John J. Gallagher Collection, Section of Invertebrate Zoology, The Carnegie Museum of Natural History, 4440 Forbes Ave, Pittsburgh, PN 15213, U.S.A. for details of accessibility and conditions.

d. *Agnes Ruttner-Kolisko*'s rotifer references are in the keeping of Jenny Schmid-Araya, Biologische Station Lunz, A-3293 Lunz-Am-See, Austria. Jenny has offered to photocopy specific needs for the cost of copy and postal charges. Contact her directly for details.

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5. Is there life after retirement?

(Ros Pontin, U.K.)

PROFESSOR JAMES GREEN certainly thinks so. Jim retired recently from his post at Queen Mary and Westfield College, which is part of London University. An excellent dinner, which I was priveleged to attend, allowed friends and colleagues to cheer him on the the next stage of his career. No longer does he have to travel into London each day from his home in Teddington, Middlesex. Now he has fixed up a laboratory in his home and a library in his garage. No longer must he allow time for teaching students of for administrative tasks, but can deevote himself entirely to whatever research topics please him. Do these include rotifers? Well, yes, of course.

He tells me that, at the moment, he is working on rotifers from the Anzaq Oasis in Jordan and on samples from lakes, including crater lakes, in Ecuador. He is hoping to visit Madagascar in the near future. Meanwhile, nearer home, he plans to construct a food web for a pond at Hampton (Near Hampton Court Palace) and at last to reveal the mysteries of spine length changes in *Keratella cochlearis* in the waters of the English Lake District, a topic which has interested him for many years.

It was Jim who first introduced me to the world of rotifers and who shared, with me and many others, his enthusiasm for these and other animals. He has lost none of his enthusiasm over the years, and looks forward keenly to pursuing his interests. I know that other rotiferologists will wish to join with me in wishing him well. We will all be looking out for your papers, Jim, describing the results of all these studies, and we look forward to seeing you again at the next Rotifer Symposium in Poland in 1994.

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6. Back copies of *Rotifer News*

.....still available from Bob Wallace at Ripon or Russ Shiel at Albury. The *suggested donation* for back issues is $US3.00/copy to cover reproduction and postage costs.

This issue of Rotifer News was produced as as standard Microsoft Word 5 file on a HP Vectra Network and printed on a HP Laserjet III printer (by Prod. Ed. RJS. with help from Marijke Korting, who explained some of the mysteries of computerese.) Contributions from readers are requested. They can be accepted as hard copy or electronically in any format, any language. Submitted disks will be returned. Send your contributions to the nearest regional editor, or directly to the production editor at MDFRC.

RECENT PUBLICATIONS

Recent rotifer-related publications provided by regional editors, by rotifer workers or abstracted by CSIRO Search Party, Melbourne (from ABN, BIOSIS, Current Contents & Streamline), are listed alphabetically. A brief summary is given where possible. Although care is taken to transcribe bibliographic information, errors may occur, particularly when poor copy faxes have been received. If errors in mailing addresses are noted, please advise one of the regional editors or Russ Shiel at MDFRC (addresses on front cover). Your assistance in communicating your publications would be appreciated!!

Ed. note: The first few citations are conference papers. The rest are published papers. Every effort has been made to include a summary, however some lists sent by authors did not contain summaries, so these papers remain unseen. The major subject areas in each citation are categorized below - many papers include several topics.

Aquaculture: 15, 16, 17, 22, 37, 38, 40, 43, 45, 57, 58, 69, 81, 101, 106, 107, 109;

Biochemistry/Genetics/Pharmacology: 21, 32, 41, 45, 84, 99;

Biogeography/taxonomy: 13, 18, 24, 27, 29, 45, 59, 60, 61, 62, 66, 68, 70, 71, 72, 73, 80, 90, 91, 92, 93, 97, 108;

Biomanipulation/Eutrophication/Perturbation: 1, 7, 8, 9, 19, 26, 39, 45, 64, 77, 95;

Ecology/Population dynamics/Food webs: 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 23, 25, 28, 30, 31, 33, 42, 44, 45, 46, 47, 49, 51, 52, 53, 54, 55, 56, 63, 65, 67, 74, 75, 76, 79, 82, 86, 87, 88, 89, 90, 94, 95, 103, 104, 105, 108, 111, 112, 113;

Toxicology: 20, 34, 35, 36, 45, 48, 78, 96, 98, 100, 102, 110.

Conference presentations:

"Eighth Int. Meiofauna Conf." 9-14 August 1992, College Park, Maryland, U.S.A.

1. **ARENSBURGER, P., A. MARTIN & M. PALMER,** Patch dynamics and population peristence of hyporheic biota: a numerical simulation model. <Dept. Zool., Univ. Maryland, College Park, MD 20742, USA.> Goose Creek streambed meiofauna included 13 species of rotifers at densities >1000/10 cm^3. Discussed population dynamics and recovery of the meiofauna after flooding and patch disturbance.

2. **MAKENKAMP, C.C. et al.** Comparison of groundwater and surface water meiobenthic communities. <Dept. Zool., Univ. Maryland, College Park, MD

20742, USA.> Compared the two assemblages - rotifers present. Spatial and temporal variations in abundance and distribution noted.

3. **SCHMID-ARAYA, J.M.** Micro-meiofaunal assemblages and rotifer diversity in a second-order alpine gravel stream. <Biologische Station Lunz, A-3293 Lunz am See, Austria.> Provided evidence of the spatio-temporal dynamics of the micromeiofauna (incl.rotifers) in this fluctuating environment.

4. **WILLIAMS, D.D.** Changes in freshwater meiofauna communities along the groundwater/hyporheic water ecotone. <Divn of Life Sciences, Scarborough Campus, Univ. of Toronto, 1265 Military Trail, Scarborough, Ont M1C 1A4, Canada.> Cores taken from small rivers in southern Ontario demonstrated that rotifers, *inter alia*, were more common in the hyporheic zone.

"Jahrestagung 1992 der Deutschsprachigen Limnologen", 5-9 October 1992 in Konstanz, Germany [from Jenny Schmid-Araya]

5. **ARNDT, H.** Rückkehr vom "microbial loop" zum tradionellen Nahrungsgewebe? <Inst. Limnol., Austrian Acad. Sci., Gaisberg 116, A-5310 Mondsee, Austria.> Rotifers & cladocerans discussed in terms of traditional food webs and the more recent microbial loop concept. Recycling processes through these herbivores may be just as significant on the microbial web as on phytoplankton.

6. **DENEKE, R.** Jahreszeitliche Veranderungen des Planktons im hypertrophen Gross-Glienicker See (Berlin) - 2. Rotatorien- und Crustaceenplankton. <Inst. Zool., Freie Univ. Berlin, Konigin-Luise Str. 1-3, D-1000, Berlin 33.> Discussed seasonal succession of rotifer and microcrustacean zooplankters in relation to algal and bacterial succession.

7. **RONNEBERGER, D.** Anderungen der Sukzession und Dynamik in der Rotatorien- und Heteropterenfauna nach Vierteilung eines Sees. Described succession and population dynamics in the rotifers of a small, experimentally compartmented moor lake near Brandenburg

Publications

8. **ADAMEK, Z. & I. SUKOP, 1992.** Invertebrate communities of former southern Moravian floodplains, Czechoslovakia, and impacts of regulation. *Reg. Rivers Res. Manag.* **7**, 181-192. <Res. Inst. Fish Culture Hydrobiol., 389 25 Vodnany, Czechoslovakia.> The natural hydrobiological conditions of southern Moravian floodplains have been drastically altered by regulation of the lower Dyje river and its tributaries. The results of faunistic studies carried out in different permanent and temporary waterbodies of the floodplains are reviewed. 188 taxa of planktonic and 206 taxa of benthic and semiplanktonic animals are recorded, including rotifers (96 taxa). Population dynamics are summarised.

9. **AESCHT, E. & W. FOISSNER, 1992.** Effects of mineral and organic fertilizers on the microfauna in a high-altitude reafforestation trial. *Biol. Fertil. Soil*

13, 17-24. <Inst. Zool., Univ. Salzburg, Hellbrunnerstr. 34, A-5020 Salzburg, Austria.> Protozoa (testate amoebae, ciliates), small metazoa (rotifers, nematodes), and soil enzymes (catalase, cellulase) were investigated in a reafforested fertilized site at the alpine timberline. Organic fertilizer caused a more pronounced increase in the soil life and greater changes in community structure than the mineral combinations. Two years after application of the fertilizers, the differences between the treatments and the unfertilized controls had diminished.

10. **ANDREW, T.E.,& A.G. FITZSIMONS, 1992.** Seasonality, population dynamics and production of planktonic rotifers in Lough Neagh, Northern Ireland. *Hydrobiologia* **246**, 147-164. <Biol. Biomed. Sci., Univ. Ulster, Coleraine, Co. Derry BT52 1SA, Northern Ireland.> *Keratella cochlearis* was the most abundant species accounting for over 40% of biomass followed by *Polyarthra dolichoptera* and *Notholca acuminata*. The seasonal pattern of biomass expression and production varied markedly in different years. Population succession and the annual occurrence of species differed in each year.

11. **ANTONSSON, U. 1992.** The structure and function of zooplankton in Thingvallavatn, Iceland. *Oikos* **64**, 188-221. <Fiskakvisl 28, IS-110 Reykjavik, Iceland.> Zooplankton was dominated by three species of rotifers and a range of crustaceans. The rotifer *Polyarthra dolichoptera* (Idelson) constituted up to 90% of the rotifer biomass in summer, while in autumn *Keratella cochlearis* (Gosse) and *Conochilus unicornis* (Rousselet) together contribute 55-80% of the rotifer biomass. Microcrustacean zooplankton dynamics are detailed.

12. **ARNDT, H. 1991.** Population dynamics and production of estuarine planctonic rotifers in the southern Baltic: *Brachionus quadridentatus* (Hermann, 1783). *Acta Ichthyol. Pisc.* **21**, 7-15. <address above.> K/W: predation, birth, death, mortality, growth, autoregulation

13. **ARNDT, H., C. SCHROEDER & W. SCHNESE, 1990.** Rotifers of the genus *Synchaeta*: An important component of the zooplankton in the coastal waters of the Southern Baltic. *Limnologica* 21, 233-235. <Address above.> At least 16 species were found. Remarks on food items, field preferences for temperature and salinity, and growth rates for some species are given. Highest abundances of *Synchaeta* species were in early spring and autumn. During early spring, *Synchaeta* account for most of the metazooplankton biomass (>60%) and are able to consume a significant fraction of the spring peak of phyto- and protozooplankton production. Their use as a food source by higher trophic levels seems to be of minor importance.

14. **ARNDT, H., H. GUDE, M. MACEK & K.O. ROTHHAUPT, 1992.** Chemostats used to model the microbial food web: evidence for the feed-back effect of herbivorous metazoans. *Ergebn. Limnol.* **37**, 187-194. <Address above.> K/W: rotifers, grazing, microbial loop, chemostat, nutrition, bacteria.

15. **AWAISS, A., P. KESTEMONT & J.C. MICHA, 1992.** An investigation into the mass production of the freshwater rotifer *Brachionus calyciflorus* Pallas 1. An eco-physiological approach to nutrition. *Aquaculture* **105**, 325-336. <Unite Ecol. Eaux Douces, Fac. Univ. Notre-Dame De La Paix, 61 Rue De Bruxelles, B-5000 Namur, Belgium.> Feeding and production rates were

determined during a daily cycle of feeding with the alga *Dictyosphaerium chlorelloides* or with the yeast *Saccharomyces cerevisiae*. The filtration rate of rotifers was significantly influenced by the cellular density of algae but not by that of yeast. At optimal cellular density and photoperiod (L:D 24:0), the filtration and ingestion rates of rotifers were maximal at 25.degree. C.

16. **AWAISS, A. & P. KESTEMONT, 1992.** An investigation into the mass production of the freshwater rotifer *Brachionus calyciflorus* Pallas 2. Influence of temperature on the population dynamics. *Aquaculture* **105**, 337-344. <address above.> The effects of temperature on rotifer population dynamics were optimal at 25.degree. C. At this temperature, the amictic females fed with *Dictyosphaerium chlorelloides* showed a high fecundity, with a mean reproduction rate of 366.9 .+-. 59.35%.

17. **BANIK, S. 1992.** Sessile rotifers as bioindicators of fish culture ponds. *Fishing Chimes* **12**, 31-33. <Dept Life Sciences, Tripura University, Agartala 799 004, Tripura (West) India.> Productive fish ponds (West Bengal) are conducive to high diversity of sessile rotifers.

18. **BATTISTONI, P.A. 1992.** Five species of the genus *Notholca* Gosse, 1886 (Rotatoria) from Argentina including *Notholca guidoi* new species. *Iheringia* Ser. Zool 0 (73), 35-45. <Inst. Limnol., C. C. 712, 1900 La Plata, Argentina.> (Spanish) *Notholca guidoi*, sp.n. from Neuquen, Argentina is described. Four species of the genus Notholca from lentic waters of Argentina are redescribed using SEM and light microscopy, and their geographical distribution is enlarged (*N. acuminata, N. labis, N. squamula, N. walterkostei*).

19. **BOULTON, A.J. & L.N. LLOYD, 1992.** Flooding frequency and invertebrate emergence from dry floodplain sediments of the River Murray, Australia. *Reg. Rivers Res. Manage.* **7**, 137-151. <Dep. Zool., Univ. Adelaide, GPO Box 498, Adelaide, 5001 S.A., Australia.> The greatest biomass and numbers of invertebrates emerged from annually-flooded sods whereas sediments usually flooded once in 22 years yielded only protozoans. Large numbers of cladocerans and rotifers were recorded within two days of inundation whereas ostracods were not numerous until two weeks later. Reducing floodplain inundation frequency through regulation and flood mitigation probably severely reduces the contribution by emergent invertebrates to newly-inundated floodplain foodwebs, removing a food resource for young fish and other predators.

20. **BROCK T C M; VAN DEN BOGAERT M; BOS A R; VAN BREUKLEN S W F; REICHE R; TERWOERT J; SUYKERBUYK R E M; ROIJACKERS R M M. 1992.** Fate and effects of the insecticide Dursban 4E in indoor *Elodea* dominated and macrophyte-free freshwater model ecosystems II. Secondary effects on community structure. *Arch. Environ. Contam. Toxicol.* **23**, 391-409. <DLO Winand Staring Centre Integr. Land, Soil Water Res., P.O. Box 125, 6700 AC Wageningen, Netherlands.> In the Elodea-dominated and macrophyte-free model ecosystems, populations of primary producers, herbivores, carnivores and detritivores were indirectly affected via the loss of populations of Arthropoda as a direct result of insecticide application. Rotifers (*Polyarthra* and *Asplanchna*) were among the organisms in which secondary effects were observed.

21. **BUCHNER, H. 1992.** Untersuchungen über die Bedingungen der heterogonen Fortpflanzungsarten bei den Rädertieren. IV. Über die Reaktivierung der miktischen Potenz bei *Brachionus urceolaris*. *Zool. Jb. Physiol.* **96**, 97-165. K/W: rotifers, reactivation of mictic potential, mixis, reproduction, environmental control.

22. **CHAKRABARTI, R. & B.B. JANA, 1992.** Diversity and abundance of plankton as indices of management strategies of common carp culture. *Arch. Hydrobiol.* **125**, 499-509. <Dep. Zool., Univ. Delhi, Delhi-110007, India.> Rotifers mentioned in this study of fertilization of carp tanks.

23. **CHUNG, J.-C. & P.F. STROM, 1991.** Microbiological study of ten New Jersey rotating biological contactor wastewater treatment plants. *Res. J. Wat. Pollut. Control. Fed.* **63**, 35-43. <Dep. Env. Sci., Cook Coll., New Jersey Agric. Exp. Stn., Rutgers Univ., New Brunswick, N.J. 08903, USA.> Biofilm samples from 10 RBC plants in New Jersey [USA] were examined microscopically for filamentous bacteria, protozoa, and metazoa. Rotifers (9) were observed frequently. The occurrence and abundance of many of the specific microorganism types appeared to be related to organic loading and/or dissolved oxygen.

24. **CHUNG, C.E., YOO, H.B. & S.Y. KIM, 1992.** Rotifera from Korean inland waters IV. *Brachionus* and *Platyas* of Brachioidae (Rotifera, Monogononta). *Kor. J. Syst. Zool.* **8** (1). 1992. 35-55. <Dep. Biol. Educ., Chonnam Natl. Univ., Kwangju 500-757, Korea.> 1 species, 9 subspecies, 2 varieties and 6 forms of two genera, *Brachionus* and *Platyas* were identified, of which, 1 subspecies and 4 forms are new to the Korean fauna.

25. **CONLAN, K., K N. WHITE & S.J. HAWKINS, 1992.** The hydrography and ecology of a re-developed brackish-water dock. *Estuarine Coastal Shelf Sci.* **35**, 435-452. <Dep. Env. Biol., Univ. Manchester M13 9PL, U.K.> Preston Docks were closed to shipping in 1981 and are undergoing redevelopment for residential, commercial and recreational use. The zooplankton community in the dock is dominated by rotifers whereas in the estuary copepods predominate. Flushing of the dock with estuarine water was partially successful in reducing algal blooms but the decreases were short-lived and did not eliminate cyanobacteria. The implications of current water quality for dock re-development are discussed and management options considered.

26. **CUKER, B.E. & L. HUDSON JR, 1992.** Type of suspended clay influences zooplankton response to phosphorus loading. *Limnol. Oceanogr.* **37**, 566-576. <Cent. Mar. Envtal Stud., Hampton Univ., Hampton, VA. 23668, USA.> The effects on zooplankton community structure of P loading and two different kinds of suspended sediments were tested in a small lake. Relative changes in microcrustaceans and rotifers are described.

27. **Dartnall, H.J.G. 1992.** *The Rotifers of Macquarie Island.* Rept to Antarctic Division, Dept of the Arts, Sport, Environment & Territories, Hobart. 1 v. ISBN 0642182086 (prepublication).<Copper Beeches, 76 Lewes Rd, Ditchling, Sussex BN6 8TY, UK.>

28. **DARTNALL, H.J.G. 1992.** The reproductive strategies of two Antarctic rotifers. *J. Zool. (Lond.)* **227**, 145-162. <Address above.> The bdelloid rotifers *Philodina gregaria* Murray and *Adineta grandis* Murray were both cultured through three generations. Mathematical expressions for population growth were formulated.

29. **DE RIDDER, M. 1992.** Contribution to the study of African rotifers: rotifers from Mali. *Hydrobiologia* **237**, 93-101. <Inst. Animal Ecol., State Univ. Ghent, 9000 Ghent, Belgium.> 92 taxa of rotifers were identified. Some were present in different forms; 56% were cosmopolitan, 19% thermophilous with a wide distribution, 20% tropicopolitan and 5% cold-stenothermous. These latter species seem to be relicts of palaeoclimatic conditions in Africa.

30. **DOLAN, J.R. & C.L. GALLEGOS, 1991.** Trophic coupling of rotifers, microflagellates and bacteria during fall months in the Rhode River Estuary. *Mar. Ecol. Prog. Ser.* **77**, 147-156. <Smithsonian Env. Res. Centre, PO Box 28, Edgewater, MD. 21037-0028, USA.> Rotifers, by grazing heterotrophic microflagellates, may have exerted an indirect effect on bacterioplankton concentration. The apparent predator-prey relationships of rotifer-microflagellate and heterotrophic microflagellate-bacteria were formally defined in a model of a rotifer-microflagellate-bacteria food web using grazing and growth rates from field patterns and experiments.

31. **DOLAN, J.R. & C.L. GALLEGOS, 1992.** Trophic role of planktonic rotifers in the Rhode River estuary, Spring-Summer 1991. *Mar. Ecol. Prog. Ser.* **85**, 187-199. <Address above.> Rotifers were abundant (average ca 1000 ind. l-1) and usually dominated by *Synchaeta cecilia* with *Brachionus plicatilis* as the second most common species. Rotifer concentrations were negatively related to microflagellate abundances. However, reproductive output of S. cecilia, as measured by eggs female-1 or egg ratio (ER) followed temporal trends in microflagellate numbers. Rotifer production figures, based on growth rates from ER data and grazing experiments, averaged ca 18 .mu.g Cl-1 d-1, exceeding previous estimates of copepod production by an order of magnitude.

32. **ESPARCIA, A., M. SERRA & M.R. MIRACLE, 1992.** Relationships between oxygen concentration and patterns of energy metabolism in the rotifer *Brachionus plicatilis*. *Comp. Biochem. Physiol.* **B Comp. Biochem. 103**, 357-362. <Ecologia, Fac. Biol., Univ. Valencia, 46100 Burjassot, Valencia, Spain.> Activities of 10 enzymes and accumulation of two metabolites under experimental hypoxia were investigated in the rotifer *Brachionus plicatilis*. Our results showed that the rotifers used the lactate pathway for anoxic glucose catabolism. Data also suggested that the glucose-succinate pathway would function at low oxygen concentrations. This pattern is consistent with the phylogenetic position of rotifers.

33. **FABBRO, L. & G.O. WATSON, 1992.** Freshwater zooplankton of the lower Fitzroy River. *Proc. Fitzroy Catchment Symp.*, 12-13 Nov. 1992, pp. 537-540. <Univ. of Central Queensland, Rockhampton, Qld, Australia.> Species composition and seasonality of zooplankton, including rotifers, is summarized.

34. **FERNANDEZ-CASALDERREY, A., M.D. FERRANDO & E. ANDREU-MOLINER, 1992.** Endosulfan and Diazinon toxicity to the freshwater rotifer *Brachionus calyciflorus*. *J. Env. Sci. Health* B, *Pestic. Food Contam. Agric. Wastes* **27**, ... <Dep. Anim. Physiol., Fac. Biol. Sci., Univ. Valencia, Dr Moliner 50, E-46100 Burjassot, Valencia, Spain.> The LC50 values after 24

hours exposure to these toxicants ranged from 6.49 to 3.48 days after endosulfan treatment, and from 6.96 to 2.49 days after diazinon exposure. No effects on survival were observed in control animals exposed to the solvent.

35. **FERNANDEZ-CASALDERREY, A., M.D. FERRANDO & E. ANDREU-MOLINER, 1992.** Filtration and ingestion rates of *Brachionus calyciflorus* after exposure to endosulfan and diazinon. *Comp. Biochem. Physiol. C Comp. Pharmacol. Toxicol.* **103**, 357-361. <Address above.> Rates of filtration and ingestion were decreased significantly at sublethal concentrations of pesticide tested after 5 hr exposure. The effective concentration at which filtration and ingestion rates were reduced to 50% of those in controls (EC50) were calculated for both toxicants.

36. **FERRANDO, M.D., E. ANDREU-MOLINER & A. FERNANDEZ-CASALDERREY, 1992.** Relative sensitivity of *Daphnia magna* and *Brachionus calyciflorus* to five pesticides. *J. Environ. Sci. Health B Pestic. Food Contam. Agric. Wastes.*, **27**, 511-522. <Address above.> Comparative toxicity of several pesticides, lindane, endosulfan, pentachlorophenol (PCP), 3,4-dichloroaniline (DCA) and copper sulphate was tested. 24 hr LC50 values (mg/L) for D. magna and B. calyciflorus, respectively, were: lindane 1.64 and 22.5; endosulfan, 0.62 and 5.15; DCA, 0.20 and 61.5; PCP, 0.39 and 2.16; copper sulphate, 0.38 and 0.076.

37. **FOURNIE, J.W., S.S. FOSS, L.A. COURTNEY & A.H. UNDEEN, 1990.** Testing of insect microsporidians (*Microspora nosematidae*) in nontarget aquatic species. *Dis. Aquat. Org.* **8**, 137-144. <U.S. Env. Prot. Agency, Env. Res. Lab., Sabine Island, Gulf Breeze, FL 32561, USA.> Paper reports results of tests with the mosquito microsporidian *Nosema algerae* and the orthopteran microsporidian *N. locustae* on nontarget aquatic organisms. Organisms tested included the marine rotifer *Brachionus plicatilis*. *N. algerae* infections did not develop in the marine rotifer after ingestion of spores or in inland silverside fed marine rotifers containing ingested spores.

38. **FROLOV, A.V. & S.L. PANKOV, 1992.** The effect of starvation on the biochemical composition of the rotifer *Brachionus plicatilis*. *J. Mar. Biol. Assoc. U.K.* **72**, 343-356. <Mariculture Lab., All-Union Res. Inst. Mar. Fish. & Oceanogr., 17-A V. Krasnoselskaya, Moscow 107140, Russia.> Alterations of the biochemical composition and survival of the rotifer *B. plicatilis* during starvation are described.

39. **FUKUNAGA, I., K. TAKAMIZAWA, Z. INOUE, T. HASEBE, M. KONAE, K. HATANO & S. MORI, 1992.** Appearance of plankton and its correlation with water quality in the stabilisation ponds at a sea-based dredged sludge disposal site. *Environ. Technol.* **13**, 449-460. <Osaka City Inst. Public Health Environ. Sci., Tohjo-Cho 8-34, Tennoji-Ku, Osaka 543, Japan.> Results showed that suppression or elimination of phytoplankton would be suitable to lower CODMn of effluent at disposal sites.

40. **FULKS, W. & K.L. MAIN (EDS), 1991.** Rotifer and microalgae culture systems : proceedings of a U.S. - Asia Workshop held in Honolulu, Hawaii, January 28-31, 1991. <Oceanic Institute, Honolulu, Hawaii, U.S.A.>: xi, 364 pp.

41. **GALKOVSKAYA, G.A. 1991.** (Trophic determination of oxygen consumption in rotifers.) *Vyest. Akad. Nauk. BSSR Syer Biyal Nauk.* 0 (5). 1991. 115-117. <Inst. Zool., Acad. Sci. B., Minsk, Beloruss. Russia> (Russian)

42. **GATTO, M., C. RICCI & M. LOGA, 1992.** Assessing the response of demographic parameters to density in a rotifer population. *Ecol. Modell.* **62**, 209-232. <Dipt Elettronica, Politec. di Milano, Milan, Italy.> A multiage class model of population growth, the parameters of which are estimated partly from life and fertility schedules and partly from mass culture data, is presented. Total life span is dramatically extended by extreme crowding, whereas total egg production is depressed and the duration of reproduction prolonged by gradually increasing the density. The ecological and evolutionary implications of these results are briefly discussed.

43. **GEHRKE, P.C. 1992.** Diel abundance, migration and feeding of fish larvae (Eleotridae) in a floodplain billabong. *J. Fish Biol.* **40**, 695-707. <Inland Fisheries Research Station, Narrandera, NSW, Australia.> Spatial and diel distribution patterns of fish larvae suggest that classes of larvae smaller than and larger than 5.00mm exhibit reciprocal diel vertical migration behaviour linked to changes in diet associated with growth. The smaller larvae fed only during the day, preying exclusively on rotifers, whereas the larger ones continued to feed at night and consumed mostly planktonic crustaceans. Such information may be useful in developing guidelines for the management of wetlands to enhance native fish recruitment.

44. **GELLER, W., R. PINTO-COELHO & H.-R. PAULI, 1992.** The vertical distribution of zooplankton (Crustacea, Rotatoria, Ciliata) and their grazing over the diurnal and seasonal cycles in Lake Constance. *Ergeb. Limnol.* 0, 79-85. <Limnol. Inst., Uni. Konstanz, Mainaustrasse 212, D-7750 Konstanz, Germany.> In herbivorous crustaceans, the diurnal rhythm of grazing seemingly is determined by the change of biomass in the epilimnion, as caused by vertical migration, leading to higher grazing rates at night. In the microzooplankton, vertical migrations appear less important, and the grazing, midnight vs. noon, shows higher activities during the day. Interpretations are given about algivory vs. bacterivory from the feeding types of the zooplankton groups and their distribution in the epi- and hypolimnion.

45. **J.J. GILBERT, E. LUBZENS & M.R. MIRACLE, (Eds) 1993.** Rotifer Symposium VI : proceedings of the Sixth International Rotifer Symposium, held in Banyoles, Spain, June 3-8, 1991. *Developments in hydrobiology* **83**.

46. **GULATI, R.D., A.L. OOMS-WILMS, O.F.R. VANTONGEREN, G. POSTEMA & K. SIEWERTSEN, 1992.** The dynamics and role of limnetic zooplankton in Loosdrecht Lakes (The Netherlands). *Hydrobiologia* **233**, 69-86. <Limnol. Inst., Vijverhof Lab., Rijksstr. 6, 3631 AC Nieuwersluis, Netherlands.> Summarises 1981-1991 zooplankton research on Lake Loosdrecht, a highly eutrophic lake. Among about 20 genera and 40 species of rotifers the important ones are: *Anuraeopsis fissa, Keratella cochlearis, Filinia longiseta* and *Polyarthra*. The rotifers usually peak in mid-summer following a crustacean peak in spring. The lack of response to restoration measures cannot be ascribed to one single factor.

47. **HANAZATO, T. & S. NOHARA,** 1992. Seasonal succession and vertical distribution of zooplankton in Lake Ozenuma. *Jpn J. Limnol.* **53**, 55-63. <Natl Inst. Environ. Stud., Onogawa, Tsukuba, Ibaraki 305, Japan.> Rotifers were more abundant than cladocerans. Copepods were rare. In biomass, however, cladocerans usually surpassed rotifers, and the

cladoceran *Holopedium gibberum* took the highest percentage of the total zooplankton biomass. Some zooplankton species were found commonly throughout the study period, whereas others appeared irregularly. It seems that, in recent years, rotifers have become more abundant in the lake.

48. HEMDAL, J.F. 1992. Reduction of ozone oxidants in synthetic seawater by use of sodium thiosulphate. *Prog. Fish-Cult.* **54**, 54-56. <Toledo Zool. Soc., 2700 Broadway, Toledo, OH 43609, USA.> Ozone gas was dissolved in synthetic seawater at various concentrations. The toxicity of the resultant ozone oxidants on *Brachionus* sp. rotifers was noted. In samples in which the oxidants were fully neutralized by sodium thiosulfate, the time to 50% rotifer mortality was comparable to that in control samples never exposed to ozone.

49. HESSEN, D.O. 1992. Nutrient element limitation of zooplankton production. *Am. Nat.* **140**, 799-814. <Norwegian Inst. Water Res., P.O. Box 69, Korsvoll, N-0808 Oslo 8, Norway.> In a regional study of 47 lakes, in which most independent variables including phytoplankton biomass and chlorophyll were scarcely correlated with zooplankton biomass but particulate P (> 0.45 um) could explain a major part of the variance of zooplankton biomass. Of the various taxa, daphnids gave the best correlation with particulate P, cyclopids and rotifers the worst.

50. HURST, L.D., W.D. HAMILTON & R.J. LADLE, 1992. Covert sex. *Trends Ecol. Evol.* **7**, 144-145. <Dept Zool., Oxford Univ., South Parks Rd., Oxford, UK OX1 3PS.>

51. KHALAL, M.T. 1990. Plankton and primary productivity of Lake Manzala, Egypt. *Hydrobiologia* **196**, 201-208. <Zool. Dept, Fac. Sci., Ain Shams Univ., Cairo, Egypt.> In response to eutrophication, the plankton species composition changed significantly over the last 20 years. Cladocerans represented less than 1% of zooplankton during 1959/60, but 75% in 1985/86. Rotifers constituted 40% in 1959/60, and only 1% in 1985/86. Cirriped larvae declined from 21% to 1%.

52. KAMINSKI, M. 1990 (1991). Fauna inhabiting in the colonies of freshwater bryozoan *Plumatella fungosa* Pall. (Phylactolaemata). *Pol. Arch. Hydrobiol.* **37**, 495-502. <Inst. Biol., Warsaw Univ., Branch Bialystok, Swierkowa 20B, 19-950 Bialystok, Poland.> In eutrophic Jorzec Lake (Poland), bryozoan colonies occurring on floating leaves of nuphar (*Nuphar lutea* Sm.) are populated by a numerous and differentiated associations of small invertebrates. Among 21 taxa singled out, Rotatoria, Cladocera, larvae of Chironomidae, Oligochaeta and Nematoda were dominant. The numbers of animals were ca. three times greater in this specific microhabitat than on leaf fragments covered with periphyton algae.

53. KINCHIN, I.M. 1992. An introduction to the invertebrate microfauna associated with mosses and lichens, with observations from maritime lichens on the west coast of the British Isles. *Microscopy (Lond)* **36**, 721-731. <27 Woodlands Rd, Slyfield Green, Guildford, Surrey GU1 1RW, U.K..> A review is given of the microfaunal groups, including rotifers, typically found in association with mosses and lichens in the British Isles.

54. KIRK, K.L. & J.J. GILBERT, 1992. Variation in herbivore response to chemical defenses - zooplankton foraging on toxic cyanobacteria. *Ecology* **73**,

2208-2217. <New Mexico Inst. Min. & Technol., Dept Biol., Socorro, NM 87801, USA.> With one exception (the cladoceran *Ceriodaphnia dubia*), the ingestion rates of zooplankton on unicellular phytoplankton (*Cryptomonas*) were not reduced by the presence of *A. affinis*. When offered *Cryptomonas* and *A. affinis* simultaneously, small cladocerans, rotifers, and the copepod fed more selectively than large cladocerans and avoided ingesting toxic filaments. This variation in herbivore response to cyanobacterial defenses may change the species composition and size structure of zooplankton communities.

55. KUBICEK, F. & J. TEREK, 1991. (Zooplankton of Svalbard, Spitsbergen.) *Biologia* (Bratisl.) **46**, 873-879. <Katedra Zool. Antropol., Prir. Fakulta, MU Brno, Kotlarska 1, Brno, Czechoslovakia.> No basic changes in associations of zooplankton were established, in spite of the fact that certain localities are strongly influenced by human activity. The significant correlation (obr. 2) between zooplankton species number (N) and locality altitude is discussed in connection with eutrophication of water systems caused by bird colonies (by means of bird excrement).

56. LAIR, N. 1992. Daytime grazing and assimilation rates of planktonic copepods *Acanthodiaptomus denticornis* and *Cyclops vicinus vicinus*: comparison of spatial and resource utilisation by rotifers and cladoceran communities in a eutrophic lake. *Hydrobiologia* **231**, 107-117. <Univ. Blaise Pascal, Hydrobiool. Des Eaux Douces, Clermont-Ferrand 63, 177 Aubiere Cedex, France.> In Lake Aydat [France] mean individual clearance rates could be ranked *Acanthodiaptomas denticornis* > *Ceriodaphnia quadrangula* > *Chydorus sphaericus* > *Daphnia longispina* > *Cyclops vicinus vicinus* > *Bosmina longirostris* > *K. cochlearis* > *K. quadrata* and *Kellicottia longispina*. Like cladocerans and rotifers, the copepods living in this eutrophic lake can feed at low oxygen concentrations.

57. LEIN, I. & I. HOLMEFJORD, 1992. Age at first feeding of Atlantic halibut larvae. *Aquaculture* **105**, 157-164. <Akvaforsk, N-6600 Sunndalsora, Norway.> The highest frequency of larvae with rotifers in the gut was found when larvae were offered food between days 55 and 69. The highest number of rotifers in the gut was found in the groups offered food between days 55 and 59. Larvae offered food as late as day 75 before sampling. The results indicate that larvae held at low temperature (4.5.degree. C) should be offered food between 44 and 59 days after hatching (200-265 d.degree.).

58. LEU, M.Y. & C.H. LIOU, 1992. Substitution of live foods with a micro-coated diet in the feeding of larval silver bream (*Sparus sarba* Forskal): Note on swim bladder inflation. *J. Fish. Soc. Taiwan* **19**, 65-73. <Preparatory Office, Nat. Mus. Marine Biol., Aquarium, Kaohsiung, Taiwan 802.> The effects of supplementing a micro-coated diet (MCD) as a substitute for live foods (rotifer, *Brachionus plicatilis*, and/or brine shrimp, *Artemia salina*, nauplii) on the growth, survival, and swim bladder inflation of larval silver bream (*Sparus sarba*) are reported. Results indicate that the MCD as a sole food source is not good enough to sustain a good growth, survival and low swim bladder inflation of larval silver bream, but it can substitute up to 50% of live foods without jeopardizing fish growth and survival.

59. MANUEL, J. DE 1989-90. Some rotifers (Rotifera: Monogononta) from inland waters of Majorca (Balearic Islands: Spain) *Boll. Soc. Hist. Nat. Balears* **33**, 189-199. <Ecologia, Fac. Biol., Univ, Barcelona, Avg Diagonal 645, E-08028

Barcelona, Spain> Listed 33 spp. of rotifers, most new records from the island. The pantropical *Keratella procurva* was included. Zoogeography was considered.

60. MANUEL, J. DE 1990. Contribution to the knowledge of the rotifer fauna (Rotifera: Monogononta) from Minorcan inland waters (Balearic Isles: Spain) *Limnetica* **6**, 119-130. <Address above.> Lists 44 spp. of rotifers, most new to Minorca and many new to Balearic Is. SEM's of some taxa included.

61. MANUEL, J. DE 1991. Distribution of Brachionidae (Rotifera: Monogononta) in Spanish Reservoirs *Verh. Internat. Verein. Limnol.* **24**, 2741-2744. <Address above.> Results of a survey of 103 reservoirs, in which 22 spp. of Brachionidae occurred. Distribution, ecological preferences, systematics & zoogeography are discussed.

62. MANUEL, J. DE, J.L. PRETUS & D. JAUME, 1992. Rotifers from the Balearic Archipelago. *Hydrobiologia* **239**, 33-41. <Address above.> All available data on the rotifer fauna are sumamrised. 100 species are known from the archipelago shown (69 Majorca, 72 Minorca, 24 Ibiza, 25 Formentera). Some examples of pantropical distribution are given, and the biotic and abiotic factors which determine the colonization of the islands by these species are discussed.

63. MARGARITORA, F.G. 1992. Influence of *Gambusia affinis* on the feature and dynamic of the zooplankton community in the pools of Castel Porziano Latium. *Riv. Idrobiol.* **29**, 747-762. <Dipt Biol. Anim. Dell'Uomo-Univ. La Sapienza Di Roma.> (Italian). Where predation is very high, the biocoenosis have undergone a considerable reduction. Ciliates and rotifers are present with dominant populations. Plankton community differences are discussed.

64. MARCOGLIESE, D.J., G.W. ESCH & R.V. DIMOCK JR, 1992. Alterations in zooplankton community structure after selenium-induced replacement of a fish community: a natural whole-lake experiment. *Hydrobiologia* **242**, 19-32. <Dept. Biol., Wake Forest Univ., P.O. Box 7325, Winston-Salem, N.C. 27109, USA.> Most of the fish species in Belews Lake, a cooling reservoir in the Piedmont area of North Carolina (USA), were eliminated in 1976-77 because of selenium poisoning. Zooplankton composition pre- and postpoisoning of the fish is compared. Rotifers are mentioned briefly - most of the discussion deals with microcrustacean zooplankton.

65. MAZUMDER, A., D.R.S. LEAN & W.D. TAYLOR, 1992. Dominance of small filter-feeding zooplankton in the Lake Ontario foodweb. *J. Gt Lakes Res.* **18**, 456-466. <Sci. Biol., Univ. Montreal, C.P. 6128, Succursale A, Montreal, Quebec H3C 3J7, Canada.> Rotifers were the most dominant herbivores in Lake Ontario in 1970 and 1982. Biomass and compositional changes are discussed. From these observations, we developed a tentative foodweb model for 1982 which suggests that energy is inefficiently transferred from the primary producers to piscivorous fish. Algae are consumed principally by rotifers which are eaten by cyclopoid copepods that are food for mysids. Planktivorous fish eat mysids and other zooplankton and play a pivotal role in controlling not only the structure of zooplankton community but also provide the principal food for the rapidly growing salmonid population. The validity of previous foodweb models of Lake Ontario is questionable because the models were based

only on crustacean zooplankton which constituted less than 25% of the zooplankton biomass.

66. MIRABDULLAEV, I.M. 1992. On species of the genus *Lophocharis* Ehrenberg, 1838 (Rotifera, Monogononta) from Uzbekistsan. *Hydrobiologia* **245**, 163-168. <Inst. Zool. Parasitol., Acad. Sci. Repub. Uzbekistan, Tashkent 700095, Uzbekistan>. Three species of *Lophocharis* are described. Two (*kutikovae* and *turanica*) are new to science, and one (*salpina*) is recorded for the first time from Uzbekistan. Some data on the variability of these species are given.

67. MITCHELL, S.A. 1992. The effect of pH on *Brachionus calyciflorus* Pallas (Rotifera). *Hydrobiologia* **245**, 87-93 <Water Res. Comm., POB 824, Pretoria 0001, South Africa.> pH was shown to exert a major influence on the growth rate and reproductive capacity of the *B. calyciflorus*.

68. MORENO, L., H. GARCIA, L PACHECO, H. SEGERS & A. INFANTE, 1992. Rotifers (Monogononta) of Nicaragua. *Acta Cient. Venez.* **43**, 243-247. <Centro Invest. Recursos Acuat. Nicaragua, Univ. Nac. Autonoma Nicaragua, Nicaragua.> 57 species were found in collections from 11 Nicaraguan habitats; most were new records for the country. The warm stenotherm, neotropical species *Brachionus havanaensis* and *Keratella americana* were the most frequent in the studied Nicaraguan freshwaters.

69. NAVARRO, J.C. & J.R. SARGENT, 1992. Behavioural differences in starving kerring (*Clupea harengus* L.) larvae correlate with body levels of essential fatty acids. *J. Fish Biol.* **41**, 509-513. <Inst. Acuicult. De Torre De La Salle, 12595 Ribera De Cabanes, Spain.> Larvae, cultured in the presence of rotifers and *Artemia* nauplii but showing little or no active feeding behaviour, displayed clear signs of starvation. Fatty acid differences are described and implications discussed.

70. NEUMANN-LEITÃO, S. 1990. Estudos taxonomicos dos Rotatoria da area estuarina-lagunar de Suape, Pernambuco (Brasil). *Trab. Oceanogr. Univ. Fed. PE* **21**, 103-164. <Dept Oceanografia, Univ. Fed. de Pernambuco, Cidade Univ. BR-50739 Recife, Pernambuco, Brasil.> (Portuguese) Some 70 taxa of rotifers are listed from this estuarine lagoon area. Half-tones and line drawings, comparative measurements, etc., are provided. K/W: zooplankton, rotifers, distribution, spècies list, Brazil.

71. NEUMANN-LEITÃO, S., & J.D. NOGUEIRA-PARANHOS, 1987/89, Zooplancton do Rio Sao Francisco - Regiao Nordeste do Brasil. *Trab. Oceanogr. Univ. Fed. PE* **20**, 173-196. <Address above.> 52 spp. of rotifers were included in this study of longitudinal zonation in the San Francisco R. K/W: zooplankton, rotifers, cladocerans, copepods, potamoplankton, river.

72. NEUMANN-LEITÃO, S., L.M. DE OLIVEIRA GUSMAO & D.A. DO NASCIMENTO VIERA, 1992. Zooplancton dos Estuarios dos Rios Massangana e Tatucca, Suape (PE - Brasil). *Arq. Biol. Tecnol.* **35**, 341-360. <Address above.> (Portuguese) Rotifers (3 spp.) were not a significant component of the zooplankton in this estuarine study. Copepoda predominated. K/W: tropical zooplankton, estuary .

73. NEUMANN-LEITÃO, S., T. MATSUMURA-TUNDISI & M. M. DO CARMO CALIJURI, 1990. Distribucao e aspectos ecologicos do zooplancton da represa do Lobo (Broa) - San Paulo. *An. IV Encontro Bras. de Plankt.* Recife 5-7 Nov. 1990: 393-413. <Address above.> (Portuguese) 17 rotifer species are included in the zooplankton in this study of Broa Reservoir. K/W: reservoir, zooplankton, rotifers, cladocerans, species list.

74. NEUMANN-LEITÃO, S., M.N. PARANAGUA & J.L. VALENTIN, 1992. The Planktonic rotifers of the estuarine lagunar complex of Suape (Pernambuco, Brazil). *Hydrobiologia* **232**, 133-143. <Address above.> Spatial and temporal distribution, abundance, diversity, equitability and species associations of the rotifers of the estuarine area of Suape (Pernambuco-Brazil), are described.

75. OEHMS, M. & A. SEITZ, 1992. Population dynamics and vertical distribution of pelagic rotifers in oligotrophic maar lakes. *Ergeb. Limnol.* **38**, 193-208. <Inst. Zool., AG Populationsbiologie, Saarstrasse 21, D-6500 Mainz, Germany.> 18 spp. of planktonic rotifers are listed, and seasonality discussed. Predominant species were *Kellicottia longispina* and *Conochilus unicornis*.

76. OLTRA, R. & M.R. MIRACLE, 1992. Seasonal succession of zooplankton populations in the hypertrophic lagoon Albufera of Valencia, Spain. *Arch. Hydrobiol.* **124**, 187-204. <Dept Ecol. Microbiol., Univ. Valencia, 46100 Burjassot, Valencia, Spain.> Dominant zooplankton species were the copepod *Acanthocyclops robustus* and the rotifer *Brachionus angularis*. Species composition, population dynamics, biomass etc. are discussed. Compared to past studies, a reduction in the number of cladocera and rotifer species was very apparent, while the numerical presence of copepods has increased due to the developing of *A. robustus*.

77. OPRAVILOVA, V. 1990. Microzoobenthos of the River Jihlava after the construction of the Dalesice Waterworks. *Limnologica* **21**, 243-250. <Dept Biol. Animals Man, Fac. Sci., J. E. Perkyne Univ., Kotlarska 2, 611 37 Brno, Czechoslovakia.> Microzoobenthos consisted mainly of the following groups of animals: Rhizopoda, Ciliophora, Nematoda, Rotatoria and Tardigrada. Abundance and biomass were studied. The reservoirs affected microzoobenthos above all by considerably reducing the supply of detritus and also by deepening the river and thus effectively raising the water level.

78. ORSTAN, A. 1992. Toxicity of acrylamide derivatives to embryos of the rotifer *Adineta vaga*. *Bull. Environ. Contam. Toxicol.* **48**, 901-906. <2016 Baltimore Rd. I-22, Rockville, MD. 20851, USA.>

79. PALMER, M.A. 1992. Incorporating lotic meiofauna into our understanding of faunal transport processes. *Limnol. Oceanogr.* **37**, 329-341. <Dept Zool., Univ. MD., College Park, MD 20742-4415, USA.> Field data and flume experiments were used to evaluate the magnitude and pattern of meiobenthic drift in a stream. Drift of the dominant taxa in this study (rotifers, early instar chironomids, oligochaetas, copepods) was flow-dependent. Diel drift patterns were reflected in reduced streambed abundances at night for chironomids and oligochaetes but not for copepods and rotifers.

80. POINAR, G.O. Jr & C. RICCI, 1992. Bdelloid rotifers in Dominican amber: evidence for parthenogenetic continuity. *Experientia* (Basel) **48**, 408-410. <Dept Entomol. Sci., Univ. Calif., Berkely, CA USA.> Recently discovered

representatives of the Class Bdelloidea from Tertiary amber from the Dominican Republic represent the oldest known fossils of the Phylum Rotifera. Assuming that the fossil bdelloids had a similar mode of reproduction as present day members of the Class (apomictic thelytoky), then contrary to current thought, some lines of parthenogenetic organisms are not doomed to an early extinction and have evolved built-in mechanisms for genetic diversity.

81. POLO, A., M. YUFERA & E. PASCUAL, 1992. Feeding and growth of gilthead seabream (*Sparus aurata* L.) larvae in relation to the size of the rotifer strain used as food. *Aquaculture* 103, 45-54. <Inst. Ciencies Marinas Andalucia, Apdo. Ofic. 11510 Puerto Real, Cadiz, Spain>. Selective feeding on two different-sized strains of the rotifer *Brachionus plicatilis* (Bs strain: 92-176 um and S-1 strain: 140-276 um) by *Sparus aurata* larvae was studied during the first two weeks after hatching. The selecting of prey varies with age and, therefore, with larval length: the larvae select small rotifers before the 8th day after hatching (larval length < 4.3 mm) and large rotifers after the 13th day (larvae > 5.1 mm).

82. PRETUS, J.L., J. DE MANUEL & L. CARDONA 1992. Temporal heterogeneity, zooplankton composition and fish food supply in the Albufera of Minorca, a highly fluctuant environment. *Bull. Inst. oceanogr. Monaco* **11**, 179-188. <Dept Ecologia, Fac. Biol., Univ, Barcelona, Avg Diagonal 645, E-08028 Barcelona, Spain> 16 rotifer spp. listed from brackish waters in general study of Minorcan lagoon limnology. Proportional composition in the diet of mullet is given.

83. RAO, N.C. & V.S. DURVE. 1992. Structure and dynamics of zooplankton community in Lake Rangasagar, Udaipur India. *J. Environ. Biol.* **13**, 343-355. <Dept Limnol. Fish., Rajasthan Ag. Univ., Udaipur Campus, Udaipur-313 001, India.> The fluctuations of the zooplanktonic assemblages in a eutrophic lake Rangasagar were studied in the year 1984-85. The rotifers dominated in summer gradually declining in winter. Cladocerans maintained an even distribution throughout the year while copepods showed bimodal distribution. Out of whole zooplankton, seven species were omnipresent and formed the bulk of 68.55% with Eucyclops dominating with a share of 17.73%. No predator-prey relationship was noticed.

84. RICCI, C. 1992 . Rotifera: parthenogenesis and heterogony. In R. Dallai (Ed.) *Sex origin and evolution*. Selected Symposia and Monographs U.Z.I., 6. Mucchi, Modena: 329-341. <Dept Biol. Anim., Univ. Torino, Via Accademia Albertina 17, I-10123 Torino, Italy.> Life cycles of bdelloids and monogononts described. Bdelloids occur in unpredictable environments, use anhydrobiosis rather than resting eggs for survival. Heterogeneity is maintained in unstable or disturbed environments - clonal populations with different characteristics are known for both monogonont and bdelloid parthenogens.

85. RIERA, J.L., D. JAUME, J. DE MANUEL, J.A. MORGUI & J. ARMENGOL 1992. Patterns of variation in the limnology of Spanish reservoirs: a regional study. *Limnetica* **8**, 111-123. <Dept Ecologia, Fac. Biol., Univ, Barcelona, Avg Diagonal 645, E-08028 Barcelona, Spain> Multivariate analysis of phytoplankton, rotifer and crustacean abundance data consistently related significance of ionic composition, nutrients and water retention time.

86. **RIPL, W., M. MOTTER, E. WESSELER & W. FISCHER, 1990.** Regional-ecological studies on the plankton and benthos of waters in the Berlin area. *Limnologica* **21**, 1-116. <Techn. Univ. Berlin, Inst. kol., Hellrieelgelstr. 6, D-1000 Berlin 33, Germany.> Comparative regional limnological studies of the plankton and benthos communities, water chemistry and sediment chemistry were carried out in several bodies of water in Berlin, Germany. The zooplankton consisted primarily of herbivores (Rotatoria, small Cladocera) for most of the year. The studies established that the functioning of aquatic ecosystems is based on the respiration, diet and stability of its communities.

87. **ROTHHAUPT, K.O. & W. LAMPERT, 1992.** Growth-rate dependent feeding rates in *Daphnia pulicaria* and *Brachionus rubens*: adaptation to intermediate time-scale variations in food abundance. *J. Plankt. Res.* **14**, 737-751. <Physiol. Ecol. Dept, Max Planck Inst., Postfach 165, D-2320 Plon, Germany.> The hypothesis was tested that zooplankton can adapt to fluctuations of their food resources at intermediate time scales in order to maximize their energy input. Rotifers and cladocerans showed a remarkably similar response. The growth rate did not affect the maximum ingestion rate in any of the species, thus indicating that adaptation to the prevailing food conditions was based on the process of food collection. Plotting the weight-specific maximum filtering rate versus the growth rate resulted in a pronounced negative slope. The slope for the weight-specific maximum ingestion rate was also negative. Hence filtering and ingestion rates seem to be determined by the size of the zooplankton, not by their weight.

88. **RUBLEE, P.A. 1992.** Community structure and bottom-up regulation of heterotrophic microplankton in Arctic LTER lakes. *Hydrobiologia* 240, 133-141. <Univ. N. Carolina, Dept. Biol., Greensboro,NC 27412, USA.> Microplankton community structures and abundance was assessed in lakes at the Toolik Lake LTER site in northern Alaska during the summers of 1989 and 1990. The microplankton community included oligotrich ciliates, but rotifers and zooplankton nauplii comprised greater than 90% of total estimated heterotrophic microplankton biomass. Microplankton biomass was lowest in highly oligotrophic Toolik Lake (< 5 mugC l-1 at the surface) and highest (up to 55 mugC l-1) in the most eutrophic lakes, experimentally fertilized lakes, and fertilized limnocorrals, consistent with bottom-up regulation of microplankton abundance.

89. **RUYTER VAN STEVENINCK, E.D. DE, W. ADMIRAAL. L. BREEBAART, G.M.J. TUBBING & B. VAN ZANTEN, 1992.** Plankton in the River Rhine: Structural and functional changes observed during downstream transport. *J. Plankt. Res.* **14**, 1351-1368. <Int. Inst. Hydraulic & Envl Eng., Aquat. Ecol. Sect., PO Box 3015, 2601 DA Delft, Netherlands.> The growth dynamics of phytoplankton, zooplankton and bacterioplankton in the River Rhine (Europe) were analysed simultaneously with a number of environmental factors in order to identify environmental steering factors and to describe some of their interrelations. Algae and rotifers showed a rapid successive development during transport, while crustaceans were only abundant in the tidal reach of the river. It seems likely that only the reduction of phosphate, as planned under the Rhine Action Programme, and not that of nitrogen, may restrict the peaks of plankton growth described here.

90. **SANOAMUANG, L.-O. 1992.** The ecology of mountain lake rotifers in Canterbury, with particular reference to Lake Grasmere and the genus *Filinia* Bory de St. Vincent. PhD. Thesis, Zoology Dept., University of Canterbury, N.Z. <Dept of Biology, Khon Kaen University, Khon Kaen, Thailand.> Thesis deals with rotifers of South Island Lakes, adds some 32 taxa to the known N.Z. rotifers. SEM is used to compare trophi of, e.g. *Filinia* spp. Four Australian taxa are recorded from N.Z. Several papers prepared from the thesis have been submitted to various journals.

91. **D.A. SCRUTON**, (et al.) (Eds) 1991. Distribution of planktonic rotifers and crustaceans in one hundred and eight lakes from insular Newfoundland.. Canadian technical report of fisheries and aquatic sciences, 83 pp. <Fisheries and Oceans, Science Branch, St John's Newfoundland, Canada.>

92. **SEGERS H.** 1992. Taxonomy and zoogeography of the rotifer fauna of Madagascar and the Comoros. *J. Afr. Zool.* **106**, 351-361. <Lab. Anim. Ecol., Rijksunivers. Gent., K.L. Ledeganckstraat 35, B-9000 Gent, Belgium.> A total of 88 rotifer taxa are identified from Madagascar and the Comoros, of which 37 are new to the Madagassian fauna. No Rotifera were previously known from the Comoros. A taxonomical reevaluation of some of the presumed endemic rotifer taxa of Madagascar is made. 12 taxa, including two generic, seven specific and three subspecific ones, remain as possible endemics of the Madagassian fauna.

93. **SEGERS, H., N. EMIR & J.MERTENS, 1992.** Rotifers from north and northeast Anatolia (Turkey). *Hydrobiologia* **245**, 179-189. <Address above.> Samples from 21 freshwater sites in Turkey yielded 91 different species of Rotifera, 42 of which are new to the Turkish fauna. *Lepadella costatoides* n. sp. is described and *L. costata* Wulfert is redescribed. *L. christineae* Koste is synonymised with *L. quinquecostata* (Lucks). Remarks on the intraspecific variability of some species of *Lecane* are given. *L. pomiformis* Edmondson is added to the synonymy of *L. pyriformis* (Daday). The synonymy of the latter with *L. paraclosterocerca* Pennak is confirmed.

94. **SHARAPOVA, L.I. & N.R. ORLOVA, 1992.** Concerning the actual population of rotifers in Kapchgaiskii reservoir in the Ili River. *Izv. Akad. Nauk. Resp. Kaz. Ser. Biol.* 0 (2), 73-77. <Kaz. State Univ., Alma-Ata, Kazakhstan.> (Russian)

95. **SIEGFRIED, C A. & J.W. SUTHERLAND, 1992.** Zooplankton communities of Adirondack lakes: changes in community structure associated with acidification. *J. Freshw. Ecol.* **7**, 97-112. <Biol. Surv., N.Y. State Mus. Albany, N.Y. 12230, U.S.A.> The generalization that the number of zooplankton species is reduced in acid lakes was strongly supported by the results of Adirondack studies. Acidity status appeared to be the most important factor determining zooplankton species richness in Adirondack lakes. Only two "generalist" species of the Adirondack region, *Diaptomus minutus* and *Keratella taurocephala*, increased in relative importance in acidic lakes. Acidification had a significant effect on zooplankton biomass.

96. **SJOGREN, M. 1992.** From heavy metals affect soil fauna to choosing variables and organisms for a test system. pp. 242-247. In Anderson, J. P. E., *et* al. (Eds). Proceedings of the Int. Symp. on environmental aspects of

pesticide microbiology, Sigtuna, Sweden, Aug. 17-21, 1992. 337P. <Dept Ecol., Ecol. Build., S-223 62 Lund, Sweden>

97. **SMET, W.H. DE & J.M. BAFORT, 1991.** Contributions to the rotifers of the Canadian High Arctic, Canada 1. Monogonont Rotifers from Little Cornwallis Island, Northwest Territories. *Nat. Can.* (Queb.) **117**, 253-261. <Lab. Plant Dierkundige Algemene Biol., Univ. Antwerpen, RUCA, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium.> In this contribution three samples of plankton and one of submerged mosses from the littoral zone were studied for their rotifer content. Fifty one taxa have been identified, 49 to species level. The majority are cosmopolitan; there are six species inhabiting the arctic, boreal and arctic boreo-alpine regions. Thirty-two species are new to the Canadian High Arctic. A new subspecies (*Keratella cochlearis polaris*) and form (*Notholca latistyla* f. *ecauda*) are described.

98. **SNELL, T.W. & B.D. MOFFAT, 1992.** A 2-D life cycle test with the rotifer *Brachionus calyciflorus*. *Envt Toxicol. Chem.* **11**, 1249-1257 <Georgia Inst. Technol, Sch. Biol. Atlanta, GA 30332, USA.> For assessing chronic toxicity, the end point for this test is r, the intrinsic rate of increase, which has high ecological relevancy because it measures the growth potential of a population. At the chronic value concentrations of 11 toxicants tested in rotifers, there was on average a 33% reduction in r as compared to controls.

99. **SNELL, T.W., P.D. MORRIS & G. CECCHINE, 1993.** Localization of the mate-recognition pheromone in *Brachionus plicatilis* of Muller (Rotifers) by fluorescent labelling with lectins. *J. Exp. Mar. Biol. Ecol.* **165**, 225-235. <Address above.> Mate-recognition is based upon male contact chemoreception of a glycoprotein pheromone on the body surface of females. The highest densities of this glycoprotein were found on the corona of females as determined by fluorescence microscopy. Lectin probes enabled us to visualize the distribution of the MRP on the body surface of females and provided insight into the copulatory behavior of males.

100. **SUGIURA, K. 1992.** A multispecies laboratory microcosm for screening ecotoxicological impacts of chemicals. *Env. Toxicol. Chem.* **11**, 1217-1226. <Sagami Women's Univ., 2-1-1 Bunkyo, Sagamihara-Shi, Kanagawa 228, Japan.> Two rotifers (*Philodina* and *Lepadella*) were among the test organisms used in the microcosm. It was shown that effects of chemical agents on the microcosm can be evaluated by measuring time-dependent changes in population density and community metabolism. Although complete evaluation must await comparative studies based on test results for other compounds, test results for other microcosms containing diverse species, and results of field experiments, it is suggested that this small-scale repeatable microcosm can be used as a tool for screening tests on generic ecosystem-level toxicity.

101. **TANASOMWANG, V, & K. MUROGA K, 1992.** Effect of sodium nifurstyrenate on the reduction of bacterial contamination of rotifers *Brachionus plicatilis*. *Aquaculture* **103**, 221-228. <Samut Sakhon Coastal Aquacult. Devt Center, Tumbon Khok-Kham, Amphoe Muang, Samut Sakhon Province 74000, Thailand.> Although sodium nifurstyrenate (NFS-Na) has been shown effective in suppressing bacterial contamination of live-food rotifers (*Brachionus plicatilis*), the earlier experiment dealt with

a density of live food lower than used in a commercial marine hatchery. This study attempted to assess the effectiveness of NFS-Na with rotifers at greater densities. No pathogenic Vibrio sp. INFL was detected from any treated rotifers after 3 h exposure.

102. **TIDOU, A.S., J.-C. MORETEAU & F. RAMADE, 1992.** Effects of lindane and deltamethrin on zooplankton communities of experimental ponds. *Hydrobiologia* **232**, 157-168. <Lab. d'Ecol. Zool., Bat. 442, Univ. Paris-Sud, 91405, Orsay, France.> Resistance of the different zooplankton species was variable and depended upon both the group and the insecticide concentration. No effect of lindane was observed on macrozooplankton such as Cladocera and Copepoda. In the deltamethrin-treated pond, all species of zooplankton were found dead a day after the treatment. The microzooplankton (Rotifera and copepod nauplii) were highly susceptible to both insecticides. The elimination of filter-feeding zooplankton by deltamethrin was followed by an increase of the concentration of chlorophyll a in the post-treatment period. Two months later the original zooplankton population recovered.

103. **TURNER, J.T. & P.A. TESTER, 1992.** Zooplankton feeding ecology - bacterivory by metazoan microzooplankton. *J. Exp. Mar. Biol. Ecol.* **160**, 149-167. <Univ. Massachusetts, Dept. Biol, N. Dartmouth, MA 02747, USA.> Bacterivory by the rotifer *Brachionus plicatilis inter alia* was examined using fluorescently labelled bacteria (FLB) and epifluorescence microscopy. FLB were visible within rotifers, nauplii, copepodites, and tintinnids, confirming ingestion. Rotifer clearance rates (32-418 mul.animal-1.h-1) exhibited no relation with FLB concentration. This is the first report of FLB ingestion by metazoan marine microzooplankton. Although rotifers and ciliates might be expected to ingest small particles such as FLB using ciliary induced feeding currents, the means by which nauplii and copepodites eat FLB is less clear. We propose that they may "eat" bacteria as they "drink" to osmoregulate.

104. **URABE J, 1992.** Midsummer succession of rotifer plankton in a shallow eutrophic pond. *J. Plankt. Res.* **14**, 851-866. <Dept Ecol. Sci., Nat. Hist. Mus. Inst., Chiba, Aoba-Cho 955-2, Chiba-Shi 280, Japan.> Temporal changes in the density of rotifer plankton were examined in a shallow eutrophic pond. Results provided strong evidence that the structure of rotifer plankton can change strikingly within a season due to species-specific differences not only in diet, but also in the ability to escape predation, even if abiotic environmental variables are stable.

105. **VASQUEZ, E. & J. REY, 1992.** Composition, abundance and biomass of zooplankton in Orinoco floodplain lakes, Venezuela. *Ann. Limnol* **28**, 3-18. <Fund. La Salle de Cienc. Nat., Estacion Hidrobiol, De Guyana, Aptdo 51, San Felix, EDO, Bolivar, Venezuela.> 60 rotifer taxa were identified in five floodplain lakes of the Orinoco River. Common and abundant rotifer species included *Keratella americana*, *K. cochlearis*, *Brachionus mirus*, *B. gessneri*, *Polyarthra vulgaris* and *Filinia longiseta*. Rotifers accounted for 64.7% of the total mean zooplankton biomass in three lakes. Mean density in the lakes was 100 times higher than in the Orinoco main stem. Lakes with highest variabilities in surface area and water depths showed highest zooplankton densities. The type of connection (direct or indirect) established between the lakes and the major source of the water also seemed important to interpret the productivity of floodplain lakes.

106. **VERPRAET, R., M. CHAIR, P. LEGER, H. NELIS. P. SORGELOOS & A. DE LEENHEER, 1992.** Live-food mediated drug delivery as a tool for disease treatment in larviculture: the enrichment of therapeutics in rotifers and *Artemia* nauplii. *Aquacult. Eng.* **11**, 133-139. <Lab. Aquacult. *Artemia* REF. Centre, Univ. Ghent, Ghent, Belgium.> Rotifers & *Artemia* nauplii were enriched with a self-emulsifying concentrate in which the therapeutic mixture trimethroprim: sulfamethoxazole was incorporated. In rotifers, the level of total therapeutics reached a value of about 116 mg/kg (protein basis) after 6 h of enrichment. The ratio of the two drugs detected in rotifers was different from the one found in Artemia, suggesting different accumulation kinetics.

107. **VILLEGAS, C.T. 1990.** The effects on growth and survival of feeding water fleas (*Moina macrocopa* Strauss) and rotifers (*Brachionus plicatilis*) to milkfish (*Chanos chanos* Forsskal) fry. *Isr. J. Aquacult. Bamidgeh* **42**, 10-17. <Aquacult. Dept, Southeast Asian Fish. Devt Cent., Tigbauan, Iloilo, Philippines.> Fry fed *M. macrocopa* reached a mean individual findl weight, daily gain in weight and yields which were significantly higher ($P<0.05$) than fry fed *B. plicatilis*. Feeding the fry with *M. macrocopa* at the rate of 60 individuals per ml resulted in fish that were 3 to 4 times bigger than fry fed *B. plicatilis*. Feeding *M. macrocopa* to fry did not significantly increase survival rates.

108. **VIITASALO, M. 1992.** Mesozooplankton of the Gulf of Finland and northern Baltic proper: a review of monitoring data. *Ophelia* **35**, 147-168. <Finnish Inst. Mar. Res., P.O. Box 33, SF-00931 Helsinki, Finland.> *Acartia bifilosa*, *Eurytemora affinis* (Copepoda), *Bosmina longispina maritima* (Cladocera) and *Synchaeta baltica* (Rotifera) were found to be the most important species in the area. Multidimensional scaling and cluster analyses revealed several distinct biogeographical areas separated by their mesozooplankton community structures in most of the seasons. Salinity gradients and coastal-open-sea-gradient explained most of the differences between the communities. However, these factors did not explain the distribution of individual species in all cases. The possible role of other factors affecting the mesozooplankton distribution and abundance, such as eutrophication, is discussed.

109. **WALZ, N. (Ed.) 1993.** Plankton regulation dynamics : experiments and models in rotifer continous cultures. *Ecological Studies* 98. Springer-Verlag, Berlin K/W: Continuous culture (microbiology), chemostat, cultures and culture media, Rotifera, ecology, plankton populations, plankton regulation dynamics.

110. **WEISS, K., J.P. LAY, A. GOEPPEL & R. LANG, 1992.** The rotifer toxicity test: A new method for the assessment of long-term effects of xenobiotics. *Chemosphere* **25**, 517-524. <GSF-Forschungszentrum, Umwelt Gesundheit, Inst. Bodenokologie, W-D 8042 Neuherberg, Germany.> A rotifer mono-species-test is proposed for the assessment of sub-lethal toxicity. As indicator for sub-acute toxic effects of lindane the deviations in the population development to untreated controls were investigated. For *Brachionus angularis* and *B. rubens* NOECs were established after 28 days lindane treatment.

111. **WOJCIECHOWSKA, W., B. KONTEK, M. MASIEROWSKA & B. POPIOLEK, 1992.** Relationship between Rotatoria and nannoplankton in late Spring in a mesotrophic lake. *Ekol. Pol.* **39**, 253-263. <Inst. Nat. Basis Plant

Production, Dep. Botany, Acad. Agric., Akademicka 15, 20-934 Lublin, Poland.> A partial relationship between the numbers of rotifers and those of nannoplankton (<30 um) as well as changes in the dominance structure of rotifer species were found.

112. **ZAGARESE, H.E. & M.C. MARINONE, 1992.** Induction and inhibition of spine development in the rotifer *Keratella tropica*: evidence from field observations and laboratory experiments. *Freshw. Biol.* **28**, 289-300. <Lab. Limnol. Pesq., Alferez Parejas 125, 1107 Buenos Aires, Argentina.> Different chemical factors were found to have opposing effects on spine morphology - those released by crustaceans induced spine elongation, those released by notonectids inhibited spines.

113. **ZOPPI DE ROA, E., W. VASQUEZ, G. COLOMINE & M.J. PARDO, 1989-1990.** (Preliminary composition of the zooplankton of the Churun River, Auyantepuy, Venezuela.) *Mem. Soc. Cienc. Nat. La Salle* **49/50**, 29-44. <Inst. Zool. Tropical, Fac. Ciencias, Univ. Central Venezuela, Apdo. 47058, Caracas 1041-A, Venezuela.> 39 species of zooplankton (25 rotifers, 9 cladocerans and 5 copepods) were collected from the waters of the Churun river and one of its afluents. New records for South America and Venezuela are listed.

INTRODUCTION

Since the 1st International Rotifer Symposium held successfully in Lunz, Austria, in September 1976, five other symposiums of this kind have taken place. These conferences every three years provide a forum for the interchange of ideas and recent development in rotifer research and are open to everybody working on rotifers. The VII International Rotifer Symposium will take place at a field station of the Institute of Ecology PAS in Mikolajki (Poland), a small town being a well-known holiday and sailing center on the Masurian Lakeland. The station itself is located 4 km from the town, on a shore of Mikolajskie Lake, at the edge of the Piska Forest and close to numerous reserves and protected areas.

PROVISIONAL PROGRAMME

The five-day scientific programme will cover all aspects of rotiferology. Oral and poster sessions will feature the following main topics:

*1 HISTORY OF ROTIFER RESEARCH: BIOGEOGRAPHY (chairpersons: A. HILLBRICHT-ILKOWSKA & H. DUMONT)

*2 METABOLIC PROCESSES: BIOCHEMISTRY (M. MIRACLE & L. KUFEL)

*3 TAXONOMY; EVOLUTION; GENETICS (C. RICCI & ST. RADWAN)

*4 BIOLOGY; REPRODUCTION & DEVELOPMENT (L. MAY & R. ŻUREK)

*5 ECOLOGY: FEEDING, POPULATION DYNAMICS (J. EJSMONT-KARABIN & B. PEJLER)

Contributions of a descriptive character dealing with zooplankton seasonal dynamics (if devoid of a broader view or a meaningfull concept) are not to be accepted. Please take it into account when preparing your presentation.

CONFERENCE PROCEEDINGS

Manuscripts of oral and poster presentations will be reviewed according to international standart, edited by the editors and published as a special issue of Hydrobiologia.

DEADLINES AND KEY DATES

2nd announcement to be mailed	1 Sept. 1993
Submission of abstracts	1 Jan. 1994
Payment of registration fee	1 Jan. 1994
3rd announcement to be mailed	1 March, 1994
Submission of manuscripts	8 June 1994

LANGUAGE

The official language of the Symposium will be English (lectures, discussions, abstracts, manuscripts).

ACCOMODATION AND TENTATIVE COSTS

The range of accomodation available will include holiday cottages, camping sites and hotels of different categories. The lowest cost of participation (registration fee and 6 nights accomodation in holiday cottages at the station and all meals) should not exceed 200 US $. Unfortunately only 45 persons can be accomodated at the station. Other participants will have to pay more, like 300 US $ if accomodated in bungalows, or even more if accomodated in hotels.