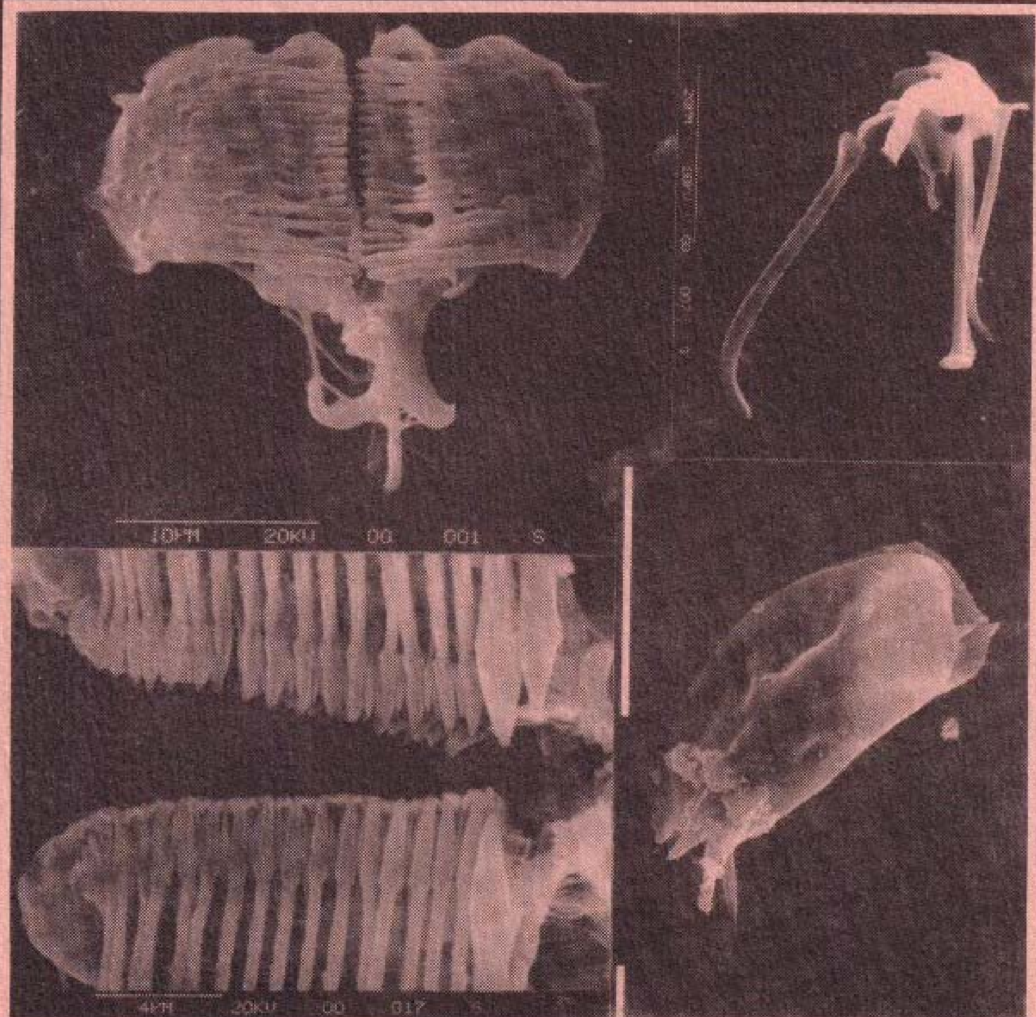
ROTIFER NEWS

A newsletter for rotiferologists throughout the world



ISSUE 21: JULY–AUGUST 1992

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PRODUCED AT

The Murray-Darling Freshwater Research Centre

ROTIFER NEWS

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 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 inside the back cover. Back issues of the newsletter are available from Bob Wallace or Russ Shiel on request. Assistance with production and mailing costs 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

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The cover: A collage of scanning electron micrographs. *Top left*: Trophus of *Filinia* sp., L. Okaro, N.Z.; *top right*: trophus of *Trichocerca gracilis*, L. Shephard, N.Z.; *bottom left*: detail of unci, *Filinia pejleri*, N.Z. (all courtesy La-orsri Sanoamuang, Canterbury University, Christchurch); *bottom right*: lorica of *Mytilina ventralis*, billabong near Wodonga, Vic. (by RJS at CEMMSA, Univ. of Adelaide).

Editorial

Responses to the first southern hemisphere production of *Rotifer News* have been positive. However, of more than 300 copies of Issue **20** posted, responses as returned questionnaires, letters or subscriptions were received from only 60 people by July. This 20% response rate and funds contributed are sufficient to keep the newsletter going, however regional editors are in agreement that only those who have responded receive Issue **21** and subsequent issues. Clearly, the mailing list included a number of attendees at the rotifer meetings, particularly the larger Gargnano and Banyoles meetings, who have not maintained a working association with Rotifera. Together with the people who contributed at Banyoles, the 'interested respondees' stand at around 85.

> An amended mailing list is included with this issue. Anyone wishing to be reinstated will need to contact a regional editor to receive *Rotifer News*.

For the interest of readers, the cost of production of 300 copies of Issue **20** was $A607 inclusive of bulk postage (economy air) to regional editors - $2/copy. It would be cheaper surface posted, but do you want to wait 3-4 months for *Rotifer News?* If you are satisfied with a photocopied newsletter on recycled paper in the present format, we can keep production costs stable. A complication is the cost of transfer of subscriptions. We hoped to maintain the $US5.oo subscription rate, however for every $US5.oo bank cheque we receive, the Australian bank's processing fee is $A5.oo - the *Rotifer News* a/c receives $A1.25, about half the production cost of a single copy! To cover issue production costs under these conditions, a subscription rate of $A10.oo will have to be levied simply to cover bank charges! No increase in production costs are envisaged, so how to minimize these excessive charges?.

Currency through the mail is not recommended, however for the few who stapled dollars, DM or pounds to their questionnaire, the exchange rate improvement as the $A declined meant they gained another issue! Currency clearly is the best way, but through the mail is not....we propose that subscriptions be collected at the rotifer meetings, as was done at Banyoles, but on a more formal basis, receipted, etc. RJS collected a range of amounts and currencies at Banyoles, converted them to $A at the June 1991 exchange rate and opened an $A a/c at the Commonwealth Bank, Albury. For those unable to attend the meetings, subscriptions could be sent to their nearest regional editor to minimise excessive bank charges at both ends, preferably in three-year amounts..

Credit card payment is not possible because of small volume (only 4 of 60 respondees favoured credit card payment); not a registered business, etc.

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Housekeeping over, the rest of the issue is devoted to preliminary information on the next of the triennial meetings, responses to the questionnaire, our featured rotiferologist (Walter Koste), newsn'views, and recent publications.

R.J. Shiel
Production Editor

Rotifer VII: preliminary information on the 1994 meeting

The organizing committee formed at Banyoles has scrutinized proposals of venues for the next meeting, Rotifer VII:

Where?: **Mikolajke, Poland**
Who? : **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 participants.... 1 March 1994
Conference... 6-11 June 1994
Submission of manuscripts.............. 8 June 1994
Poste-conference field trip...............11 June 1994

Please use the enclosed postcard to let Jolanta know if you are interested in receiving the second circular.

Questionnaire responses

As mentioned in the Editorial, >300 questionnaires went out, with 60 returns to date (end July, 1992), including a few new rotiferologists who copied questionnaires sent to other workers. A few questionnaires are still coming in each week - many long-established rotiferologists who we know are active in their fields have not yet responded, and there appear to have been some mail delivery problems in Europe, possibly a reflection of the Olympics in Barcelona, political upheavals, and so on. A more detailed analysis of needs, suggestions, etc., will have to wait until #22, however some of the more pressing suggestions are included here.

1. Addresses: some addresses suffered in the electronic transfer from Bob Wallace's files to the Australian end, some were incorrect in the first place, some have changed. Regional editors have advised some corrections, but the amended list enclosed should be checked for correctness. All 'deletees' from the original mailing list will be notified and sent the response card for Rotifer VII, just in case they've been busy..........;

2. e-mail or other electronic mailing addresses: very few people notified us, so will have to be included in an amended list of rotifer workers in a later issue;

3. Research interests: Will be detailed with amended addresses in Issue 22;

4. Additions to mailing list: List received from Jolanta of eastern European rotifer workers, others nominated on questionnaires. All will be contacted and listed in Issue 22 if responsive.

5. Is Bibliography useful?: *Almost* unanimous support - 58/60 responses that the bibliography ranged from useful to invaluable (it's okay David, Jim, I won't tell everybody who you are, but I should tell them that you have access to *Current Contents* and were not being difficult!). One queried whether the production editor found it useful in view of the time commitment, and my answer must be an unqualified 'Yes!' It could not be done without the help of Penny Braybrook, CSIRO Search Party in Melbourne (Yes, there is a cost on a quarterly basis which is met from my diminishing research funds courtesy of MDFRC, but the wide range of data bases searched, the contacts made possible and the general better-informed feeling I get - no, Bob, not quite a warm glow - make it worthwhile).

6. How to improve? I would be the first to admit that the bibliography is incomplete, but it is as up-to-date as we can make it. If you want more complete or more up-to-date, you have to get more in-progress, in prep. etc information to us (see Newsn'views section). Several requests for keywords, subject index, author index will be attended to in this and subsequent issues. Several people queried the possiblity of having the complete rotifer bibliography on disk. If there is sufficient call for a complete bibliography, it is feasible to electronically scan Issues 1-19 and compile a full bibliography as time permits. The 20/21 bibliographies are available on request.

To give us some idea of demand, if you would like to receive the entire rotifer bibliography either on disk or as hard copy, let a regional editor know.

If you provide a disk, specify the format/word processing package used and whether a virus-check has been made.

7. Language? All 60 respondees were in agreement that the present policy of mostly-English is fine, but some pointed out that there is a chance of precluding some rotifer workers from contributing if English is a requirement. As production editor has the final say, and *Rotifer News* was set up primarily as an informal means of communication between **everybody**, I stress that we will take contributions in **any** language, and if necessary provide a brief summary in another. Most regional editors are at least bilingual, some tri- or more - if it's worth getting across to the rest of our readers we can do it!

8. Other suggestions? There were lots, mostly supportive, constructive. They will be discussed in more detail next issue, however the most often were:

- -just keep it going!;
- -more personal and research news;
- -life and times of an extant rotiferologist in each issue;
- -notice of systematic changes, e.g. new taxa, new combinations;
- -invited contributions, particularly methodology, or snippets which may not justify a complete publication;
- -inclusion of notices of meetings of related interest;
- -advice on training possibilities in rotiferology for young scientists from developing countries;
- -should *Rotifer News* carry advertisements to defray publication costs?;

These and other suggestions would produce a more informative newsletter....if you have a few minutes to send a postcard to regional or production editor with news, views, comments on the above suggestions, please do so – it will make Rotifer News **a newsletter and not just a list of publications.**

Dr rer. nat. h.c. Walter Koste of Quakenbrück

In response to requests to provide a biography and bibliography of prominent rotifer workers, it is a pleasure to include the achievements of Walter Koste, who celebrated his 80th year on July 19, 1992. A summary of Dr Koste's career comes courtesy of Ruth Laxhuber in Munich, who prepared a complete version for the Proceedings of the Banyoles meeting I am only one of many to whom Dr Koste has freely given of his expertise over the years. [R.J. Shiel]

Walter Koste was born in Stolp (Pommern), a region which is now part of Poland, on July 19th, 1912, son of the state railway employee Adolf Koste and his wife Ottilie. His schooling was in Stolp, and it was during his secondary education in the local gymnasium that his interest in natural sciences developed. His biology teacher promoted these activities after noticing the young Walter's careful and detailed drawings. When the Koste family moved to Stettin in 1928, Walter's mentor gave him two zoological texts (Kukenthal/Matthes and Haekel) which were to guide his future direction. Significant also seems to have been the time he spent with his grandfather, who fished the Masurian Lakes during Walter's adolescence and undoubtedly fixed the young man's hydrobiological direction.

A desire to study veterinary medicine could not be pursued because of the economic constraints of the 1930's - Dr Koste worked as an agricultural trainee, then joined the Wehrmacht in 1934, where he worked in administration. He married Hildegard Luck in 1939, but the outbreak of war saw him transferred before the birth of their son Peter in 1940. His subsequent internment in a Russian prisoner of war camp meant years of privations before he returned to find his wife and son in Niedersachsen. A further year passed before he regained his health.

From 1950-1952 Dr Koste undertook training as an elementary school teacher, and during this time participated in a number of biology courses and excursions on the moors of the Oldenburg, Rhön and Weser regions. During vacations he began to study the microflora and microfauna of the waters samples, and thence began his intensive study of the rotifer fauna. From 1952, while teaching, and from 1955, when he became headmaster of a country school, he concentrated on rotifers. Contacts were established with the other rotifer specialists of the time - Hauer, Wulfert, Donner, Voigt, Berzins and Sewell-Wright, all of whom supported his interest, provided literature, and encouraged Dr Koste to publish his observations.

From 1957-60 Dr Koste undertook secondary teacher-training and in 1961 passed the examination. His first formal rotifer paper appeared in *Zoologischer Anzeiger* in the same year. An appointment to the Artland secondary school in Quakenbrück came in 1962, and he was to stay here as a biology/geography teacher, later deputy headmaster, until 1974. He also participated in teaching microscopy/invertebrate zoology courses at Osnabrück College of Education (later University) until 1978. During this time he published more than 50 papers describing his observations on the local and global rotifer fauna, commenced his revision of Voigt's *Rotatoria - Die Rädertiere Mitteleuropas*, and established a global network of interested rotifer workers, both amateur and professional. The two-volume revision, published by Borntraeger, Stuttgart, finally appeared in 1978 after >10 years in preparation, and has stood since then as the single most important reference to the Rotifera.

In the ensuing years Dr Koste maintained his productive effort - a further 80 papers have been published since his monographic revision. Just as he contacted the specialists of his day, he has been recognized for his efforts by the new generation of 'rotiferologists' - many of them have been welcomed in his home (and tolerated with great kindness by Hildegard Koste!) - from Australia, Belgium, Canada, England, France, U.S.A. and U.S.S.R., plus an uncountable number of samples from all corners of the world appearing in his mailbox. The hours spent at his desk responding to these pleas for assistance have not been counted nor charged for - Dr Koste's primary interest has been the spread of taxonomic knowledge of the Rotifera.

The death of his wife in 1989 saw Dr Koste leave Quakenbrück for a short time, but he soon returned to Ludwig-Brill-Strasse and set up his office-laboratory-library once again. He interrupted his microscope studies to visit countries from which he had studied the rotifers for many years - Australia in Sept-Oct. 1990, supported by the Murray-Darling Freshwater Research Centre, and Brazil in Nov. 1991, supported by the Institute for Zooplankton of INPA. He has continued to attend congresses and symposia in various European countries - as a member of SIL since 1965 and the Deutsche Zoologische Gesellschaft since 1974 - including the triennial rotifer symposia.

Dr Koste's work was and is a task for life, and has to a large extent been honorary. The community of rotifer workers owes an appreciation and acknowledgement to the tireless efforts of Walter Koste, who continues, in his 80th year, to provide help to amateur and scientist all over the world.

Biography excerpted from an original translated by Ruth Laxhuber, revised by Rosalind Pontin, additions by Russ Shiel.

Dr.h.c. WALTER KOSTE: List of publications

1. 1961: KOSTE, W.: *Paradicranophorus wockei* nov.spec., ein Rädertier aus dem Psammon eines norddeutschen Niederungsbaches. - Zool. Anz. 167: 138-141.

2. 1962: KOSTE, W.: Über die Rotatorienfauna des Darnsees in Epe bei Bramsche, Kreis Bersenbrück. - Veröff. Naturw. Vereins Osnabrück 30: 73-206.

3. 1964: KOSTE, W. & K. WULFERT: Rotatorien aus der Wüste Gobi. - Limnologica 2: 483-490.

4. 1965: KOSTE, W.: Die Rotatorien des Naturdenkmals "Engelbergs Moor" in Druchhorn, Kreis Bersenbrück. - Veröff. des Naturw. Vereins Osnabrück 31: 49-82.

5. 1967a: KOSTE, W.: Merkwürdige Rädertiere (Rotatorien) aus Gewässern des Kreises Bersenbrück. - Mitt. Kreisheimatbund Bersenbrück 14: 107-138.

6. 1967b: KOSTE, W.: Über die Kleinlebewelt der Gewässer unseres Heimatkreises. - Heimat-Kalender, Bersenbrück 1967: 99-103.

7. 1968a: KOSTE, W.: Über *Proales sigmoidea* (Skorikow) 1896 (eine für Mitteleuropa neue Rotatorienart) und *Proales daphnicola* (Thompson) 1892. - Arch. Hydrobiol. 65: 240-245.

8. 1968b: KOSTE, W.: Kunstformen der Natur. - Heimat-Kalender, Bersenbrück 1968: 94-97.

9. 1968c: KOSTE, W.: Über moosbewohnende Rädertiere von Strohdächern alter Gebäude in Hahlen und Kl. Bokern Kreis Bersenbrück. - Mitt. Kreisheimatbund Bersenbrück 15: 123-128.

10. 1968d: KOSTE, W.: Das moorbewohnende Rädertier *Tetrasiphon*. - Mikrokosmos 57: 334-337.

11. 1968e: KOSTE, W.: Über die Rotatorienfauna des Naturschutzgebietes "Achmer Grasmoor" in Achmer, Kreis Bersenbrück. - Veröff. des Naturw. Vereins Osnabrück 32: 107-193.

12. 1969a: KOSTE, W.: Über Leben im Boden. - Heimat-Kalender, Bersenbrück 1969: 87-90.

13. 1969b: KOSTE, W.: Das parasitische Rädertier *Albertia naidis*. - Mikrokosmos 58: 212-216.

14. 1969c: KOSTE, W.: *Filinia*, eine pelagisch lebende Rädertiergattung. - Mikrokosmos 58: 298-302.

15. 1969d: KOSTE, W.: *Notommata copeus*, und einige verwandte Arten. - Mikrokosmos 58: 137-143.

16. 1969e: KOSTE, W.: Das sessile Rädertier *Ptygura velata*. - Mikrokosmos 58: 1-6.

17. 1969f: KOSTE, W.: Das schönste aller Rädertiere: *Stephanoceros fimbriatus*. - Mikrokosmos 58: 370-373.

18. 1970a: KOSTE, W.: Über die sessilen Rotatorien einer Moorblänke in Nordwestdeutschland. - Arch. Hydrobiol. 68: 96-125.

19. 1970b: KOSTE, W.: *Collotheca trilobata*, ein seltenes sessiles Rädertier. - Mikrokosmos 59: 195-200.

20. 1970c: KOSTE, W.: Über eine parasitische Rotatorienart *Albertia reichelti* nov. spec. - Zool. Anz. 184: 428-434.

21. 1970d: KOSTE, W.: *Macrotrachela quadricornifera*, ein moosbewohnendes bdelloides Rädertier. - Mikrokosmos 59: 328-332.

22. 1970e: KOSTE, W.: Zur Rotatorienfauna Nordwestdeutschlands. - Veröff. des Naturw. Vereins Osnabrück 33: 139-163.

23. 1970f: KOSTE, W.: Die Rädertier-Gattung *Lindia*. - Mikrokosmos 59: 134-138.

24. 1970g: KOSTE, W.: Das Putzerrädertier *Proales daphnicola*. - Mikrokosmos 59: 49-51.

25. 1971a: KOSTE, W.: Die Rädertiergattung *Collotheca* - Mitteleuropäische Arten mit besonders auffallenden Koronalfortsätzen. - Mikrokosmos 60: 161-167.

26. 1971b: KOSTE, W.: KURT WULFERT, ein Nachruf. - Arch. Hydrobiol., 68: 457-461.

27. 1971c: KOSTE, W.: KUTIKOVA, L.A. - Die Rädertiere der Fauna USSR (Ukl. Eurotatoria: Ploimida, Monimotrochida, Paedotrochida. Best.Bücher zur Fauna USSR, 104: 1-744. Buchbesprechung. - Arch. Hydrobiol., 69: 142.

28. 1972a: KOSTE, W.: *Collotheca campanulata longicaudata*. - Mikrokosmos 61: 97-99.

29. 1972b: KOSTE, W.: Über zwei seltene parasitische Rotatorienarten. *Drilophaga bucephalus* Vejdovsky und *Proales gigantea*. - Osnabrücker Naturw. Mitt. 1: 149-158.

30. 1972c: KOSTE, W.: Rotatorien aus Gewässern Amazoniens. - Amazoniana 3: 258-505.

31. 1972d: KOSTE, W.: Über ein sessiles Rädertier aus Amazonien, *Floscularia noodti* sp.n. - Arch. Hydrobiol. 70: 534-540.

32. 1972e: KOSTE, W.: *Rhinoglena frontalis*, ein lebendgebärendes Rädertier. - Mikrokosmos 61: 358-360.

33. 1972f: KOSTE, W.: Ein seltener Außenparasit an Süßwasser-Oligochaeten: *Cephalodella parasitica*. - Mikrokosmos 61: 10-12.

34. 1972g: KOSTE, W.: Ein Rädertier des Hochmoores: *Monommata arndti*. - Mikrokosmos 61: 269-273.

35. 1972h: KOSTE, W.: Über ein sessiles Rädertier aus Amazonien, *Ptygura elsteri* n.sp., mit Bemerkungen zur Taxonomie des Artkomplexes *Ptygura melicerta* (EHRENBERG) 1832. - Int. Revue ges. Hydrobiol. 57: 875-882.

36. 1973a: KOSTE, W.: *Horaella thomassoni* n.sp., ein neues Rädertier aus Gewässern der Guiana-Brasilianischen Region der Neotropis. - Arch. Hydrobiol. 72: 375-383.

37. 1973b: KOSTE, W.: Ein merkwürdiges festsitzendes Rädertier: *Cupelopagis vorax*. - Mikrokosmos 62: 101-106.

38. 1973c: CHENGALATH, R., C.H. FERNANDO & W. KOSTE: Rotifera from Sri Lanka (Ceylon) 2. Further studies on the Eurotatoria including new records. - Bull. Fish. Res. Stn. Sri Lanka (Ceylon) 24: 29-62.

39. 1974a: KOSTE, W.: Die Rädertiergattung *Notholca*. - Mikrokosmos 63: 48-52.

40. 1974b: KOSTE, W.: Rotatorien aus einem Ufersee des unteren Rio Tapajos, dem Lago Paroni (Amazonien). - Gewässer und Abwässer 53/54: 43-68.

41. 1974c: KOSTE, W.: Zur Kenntnis der Rotatorienfauna der "schwimmenden Wiese" einer Uferlagune in der Varzea Amazoniens, Brasilien. - Amazoniana 5: 25-59.

42. 1974d: KOSTE, W.: *Ptygura pectinifera*, die "Kammträgerin", eine Einwanderin in Warmwasseraquarien. - Mikrokosmos 63: 182-187.

43. 1974e: CHENGALATH, R., C.H. FERNANDO & W. KOSTE: Rotifera from Sri Lanka (Ceylon) 3. New species and records with a list of rotifera recorded and their distribution in different habitats from Sri Lanka. - Bull. Fish. Res. Stn. Sri Lanka (Ceylon) 25: 83-96.

44. 1975a: KOSTE, W.: *Seison annulatus*, ein Ektoparasit des marinen Krebses *Nebalia*. - Mikrokosmos 64: 341-347.

45. 1975b: KOSTE, W.: Macrochaeten, die "Igel" unter den Rädertieren. - Mikrokosmos 64: 143-147.

46. 1975c: KOSTE, W.: Über den Rotatorienbestand einer Mikrobiozönose in einem tropischen aquatischen Saumbiotop, der *Eichhornia-crassipes*-Zone im Litoral des Bung-Borapet, einem Stausee in Zentralthailand. - Gewässer und Abwässer 57/58: 43-58.

47. 1975d: KOSTE, W.: RUTTNER-KOLISKO, A. - Plankton rotifers, biology and taxonomy. "Die Binnengewässer" Bd. 16/1, Supplement, 1-146. Stuttgart, 1975. Buchbesprechung. - Arch. Hydrobiol. 76: 133-134.

48. 1976a: KOSTE, W.: *Trochosphaera aequatorialis*, das "Kugelrädertier". - Mikrokosmos 65: 265-271.

49. 1976b: KOSTE, W.: Über die Rädertierbestände (Rotatoria) der oberen und mittleren Hase in den Jahren 1966-1969. - Osnabrücker Naturw. Mitt. 4: 191-263.

50. 1977a: KOSTE, W.: *Ptygura pedunculata* , ein Rädertier mit kristallklarem Gehäuse. - Mikrokosmos 66: 37-40.

51. 1977b: KOSTE, W.: Über drei neue Formen des Genus *Hexarthra* Schmarda 1854: *H. jenkinae f. nakuru* n.f., *H. brandorffi* n.sp. und *H. polyodonta soaplakeiensis* n.ssp. - Gewässer und Abwässer 62/63: 7-16.

52. 1978a: KOSTE, W.: Rotatoria. Die Rädertiere Mitteleuropas, begründet von Max VOIGT. Monogononta. - Gebrüder Borntraeger, Berlin, Stuttgart., Textband: I-VIII + 1-673, Tafelband T. 1-234.

53. 1978b: KOSTE, W.: *Synchaeta grandis*, ein in Mitteleuropa vom Aussterben bedrohtes Planktonrädertier. - Mikrokosmos 67: 331-336.

54. 1978c: KOSTE, W.: Über *Testudinella ohlei* KOSTE 1972, ein Rädertier der U.-Ordnung Flosculariacea aus der Guiana-Brasilianischen Region der Neotropis. - Arch. Hydrobiol. 82: 359-363.

55. 1979a: KOSTE, W.: *Lindia deridderi* n.sp., ein Rädertier der Familie Lindiidae (Überordnung Monogononta) aus SE-Australien. - Arch. Hydrobiol. 87: 504-511.

56. 1979b: KOSTE, W.: *Hexarthra mira*, ein sechsarmiges Planktonrädertier. - Mikrokosmos 68: 134-139.

57. 1979c: KOSTE, W.: New rotifera from the River Murray, south eastern Australia, with a review of the australian species of *Brachionus* and *Keratella*. - Aust. J. Mar. Freshwater Res. 30: 237-253.

58. 1979d: SHIEL, R.J. & W. KOSTE: Rotifera recorded from Australia. - Trans. R. Soc. S. Aust. 103: 57-68.

59. 1980a: KOSTE, W.: *Brachionus plicatilis*, ein Salzwasserrädertier. - Mikrokosmos 69: 148-155.

60. 1980b: KOSTE, W.: Über zwei Plankton-Rädertiertaxa *Filinia australiensis* n.sp. und *Filinia hofmanni* n.sp., mit Bemerkungen zur Taxonomie der *longiseta-terminalis* - Gruppe. Genus *Filinia* BORY DE ST.VINCENT, 1824, Familie Filinidae BARTOS, 1959 (Überordnung Monogononta). - Arch. Hydrobiol. 90: 230-256.

61. 1980c: KOSTE, W. & R.J. SHIEL: New rotifera from Australia. - Trans. R. Soc. S. Aust. 104: 133-144.

62. 1980d: KOSTE, W. & R.J. SHIEL: Preliminary remarks on the characteristics of the rotifer fauna of Australia (Notogaea). - Hydrobiologia 73: 221-227.

63. 1980e: KOSTE, W. & R.J. SHIEL: On *Brachionus dichotomus*, Shephard, 1911 (Rotatoria:Brachionidae) from the Australian region, with a description of a new subspecies, *Brachionus dichotomus reductus*. - Proc. R. Soc. Vic. 91: 127-134.

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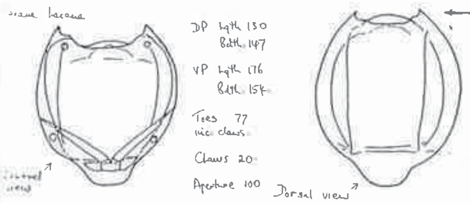
News, Notes and Requests

This section is for exchange of information, taxonomic notes, requests for assistance, bad jokes from Bob Wallace, indeed, bad jokes from anybody as long as they are pertinent to the Rotifera....but there needs to be input from you, the rotiferologist, to a regional editor or Russ Shiel direct. Thus, until such snippets are communicated, you will have to put up with most news from the Australian end........

1. News on the revision of the global rotifer assemblage 'committeed' and delegated at Gargnano, to be included in SPB Academic Publishers series of *Guides to the Identification of the Microinvertebrates of the Continental Waters of the World*.....it's happening, overseen with much patience by Tom Nogrady and coordinated by Henri Dumont. The first introductory part is with the publishers; the other parts (by family) are in various stages of completion, with apologies for the delay from some authors (e.g. RJS) who bit off a little more than could be completed in the allotted time....(!), but, it's happening!

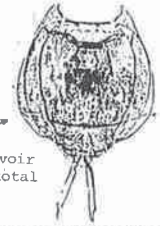
2. No communication to the regional editors on the publication date for Rotifer VI Proceedings (Banyoles). Henri noted (in June) that the 73 MS' accepted for the volume were still being processed, but it must be getting close!

3. Ros Pontin spent a couple of months wading in billabongs and temporary waters at MDFRC last year. One of her finds was a lecanid (Fig. 1) similar to an animal (Fig. 2) found by Garth Watson in a 10 m depth trap sample in nearby L. Hume. This beast seems to be *Lecane spenceri* described by Anderson & Shephard from southern Victoria in 1892. The name was listed in Harring (1913), but was synonymised with *L. luna* in Koste (1978). There are too many morphological differences for the two taxa to be conspecific. The question now is, has anyone else seen this animal and called it *L. luna*? Contact Ros or Russ if you have any input.



1. Ros's rotifer from a floodplain pool;

2. Garth's lecanid from a deep reservoir (ca. 205 µm total length)



4. Garth Watson at MDFRC (address inside front cover), has developed a technique for extracting rotifer trophi from single animals for light- or electron microscopy. It is quick (5 min), efficient (better than 99% success rate), and overcomes the problems associated with hypochlorite digestion. Garth will write up his method for a brief communication, however if you wish to contact him, please do;

5. Don't forget the John J. Gallagher collection in Pittsburgh for copies of your rotifer-related research. In addition to sending information on your work in progress to *Rotifer News*, MDFRC, keep the John J. Gallagher collection supported by sending copies to:

Curator in Charge
John J. Gallagher Collection
Invertebrate Zoology
The Carnegie Museum of Natural History
4440 Forbes Ave, Pittsburgh, PN 15213, USA

6. In the context of #5, knowing where to go for reprints for those of us who do not have access to one of the major libraries is one function of *Rotifer News*. Finding some of the early publications is becoming increasingly difficult, even some of the more recent works in less-accessible journals. If you cannot find a paper you need, contact a regional editor and have it circulated...one of us might have it.

7. Back copies of *Rotifer News*...still available from Bob Wallace at Ripon or Russ Shiel at Albury. For this issue we have held the *suggested donation* for back issues at $US3.oo/copy to cover reproduction and postage costs.

8. Just arrived from Claudia Ricci after completion of this issue's Bibliography - a record of bdelloids in amber from the Tertiary in the Dominican Republic (35-40x10^6 yr B.P.) to add to the meagre record of fossil rotifers (Poinar & Ricci, 1992 in *Experientia* **48**); also a demography model of population growth by Gatto, Ricci & Loga (1992 in Ecol. Model. **62**) based on experiments with *Philodina roseola*. More next issue!

IF YOU WANT ANYTHING INCLUDED IN NEWSN'VIEWS IN FUTURE ISSUES YOU HAVE TO TELL ONE OF THE REGIONAL EDITORS - IT WON'T JUST HAPPEN.......

Vale

Rotifer News here records, sadly, the passing of Professor David Grover Frey, of Bloomington, Indiana, on March 31st. D.G. Frey was a product of the Juday/Birge era in limnology. Had he not been sidetracked first by paleolimnogy, and later by painstaking systematic studies of chydorid cladocerans, he would have been a rotiferologist, such was the breadth of his limnological interest and expertise. D.G. Frey was a respected member of the global limnological community - at the time of his death he was President of SIL, the Societas Internationalis de Limnologiae. The extensive Frey library and sample collection has been bequeathed to the National Museum of Natural History in Washington, and a Cladoceran Lab. will be set up by the NMNH for access to his and other collections. Thanks to the efforts of his wife, Dr E. (Libby) Frey, his unfinished manuscripts on *Pleuroxus* and the Gondwanan *Rak* fauna will be completed. Prof. Frey was a committed, tireless worker who freely offered his expertise, space in his laboratory, access to his collections, even a bed on his couch at home, to many neophyte (and not so new) cladocerologists from around the world. I record here my appreciation for his large rotifer reprint collection, which was gratefully received at MDFRC when he retired from teaching at Indiana University. [RJS]

ROTIFER BIBLIOGRAPHY #21: JULY, 1992

Recent rotifer-related publications provided by regional editors, by rotifer workers or abstracted by CSIRO Search Party, Melbourne, are listed alphabetically. A brief summary is given where possible. Although care is taken to transcribe bibliographic information, errors may occur. 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: Several citations in this issue were given only as titles in #19 (1991) or #20 (1992). They are listed again to include a summary. By popular request a brief index is included in this issue to reduce search time for particular areas of interest. Only the major areas in a citation are categorized - many papers include several topics.

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1. **AKINBUWA, O. & I.F. ADENIYI, 1991.** The Rotifera fauna of Opa Reservoir, Ile-Ife Nigeria. *J. Afr. Zool.* **105**, 383-392. <Dep. Biol. Sci., Nigerian Defence Acad., P.M.B. 2109, Kaduna, Nigeria>. A qualititative study of Rotifera fauna was carried out in Opa Reservoir, Oyo State of Nigeria. 61 species were recorded, higher species richness cf. other Nigerian and African waters. Four of these species, *Dicranophorus* sp., *Encentrum felis*, *Platyias polyacanthus* and *Philodinavus paradoxus* were recorded for the first time in Nigeria. The reservoir is a reliable potable water supply and has a high potential for thriving fishery.

2. **ALI, A.B. 1991.** Zooplankton abundance and composition in catfish (*Clarias macrocephalus*) ponds. *Pertanika* **14**, 37-42. <Sch. Biol. Sci., Univ. Sains Malaysia, 11800 Minden, Penang, Malaysia.> Copepods and rotifers were dominant with cladocerans a minor component in catfish ponds. Copepod larvae (nauplii) were dominant, rotifers *Brachionus quadridentatus* and *Lecane luna* were abundant. Among cladocerans, *Macrothrix spinosa* was the dominant species.

3. **ANAKUBO, T. & M. MURANO, 1991** (Seasonal variation of zooplankton in Tokyo Bay.) *J. Tokyo Univ. Fish.* **78**, 145-166. <Watarida Jun. High Sch., 11-4 Watarida-Mukai-sho, Kawasaki-Ku, Kawasaki, Kanagawa 210, Japan.> Seasonal variation of zooplankton in Tokyo Bay was studied Oct. 1980-Sept. 1982. Species found: five protozoans, four rotifers, three cladocerans, 14 copepods, one chaetognath and one appendicularian. The cyclopoid copepod, *Oithona davisae*, comprised 36 to 99% of total zooplankton.

4. **ANITHAKUMARI, L.R. & P.K. ABDUL AZISK, 1989 (1991).** Limnology of a temple tank in Thiruvananthapuram, Kerala. *J. Inl. Fish. Soc. India* **21**, 31-36. <Dept Aquatic Biol. & Fisheries, Univ. Kerala, Thiruvananthapuram 695 007, Kerala, India.> The Pulkulangara temple tank is one of the oldest tanks in Thiruvananthapuram, Kerala State (India). Used daily for bathing and washing of clothes by a large local population, the tank represents a typical case of anthropogenic degradation, frequently experiencing *Microcytis* blooms. Low plankton species diversity occurs, the phytoplankton restricted to *Microcystis* and *Tetraspora* and the zooplankton to a few species of crustaceans and rotifers..

5. **ARCIFA, M.S., E.A.T. GOMES & A.J. MESCHIATTI, 1992.** Composition and fluctuations of the zooplankton of a tropical Brazilian Reservoir. *Arch. Hydrobiol.* **123**, 479-495. <Dep. de Biologia, Univ. de Sao Paulo, Av. Bandeirantes 3900, 14049 Ribeiro Preto, SP, Brasil.> The zooplankton of Lake Monte Alegre, an eutrophic small reservoir was sampled weekly for 14 months, by vertical hauls with a net. During the whole period the community was composed of 15 species of Rotifera, 9 of Cladocera, 2 of Copepoda and 1 of Chaoboridae. Seasonality, influence of physico-chemical and biological factors, e.g. predation, are discussed.

6. **BALVAY, G. & M. LAURENT, 1990.** (Long-term quantitative evolution of rotifers during the eutrophication in Lake Geneva, Switzerland.) *Aquat. Sci.* **52**, 162-175. <Inst. de Limnol., INRA, BP 511 75, Ave de Corzent, 74203 Thonon-Les-Bains Cedex, France.> An increase in rotifer abundance and species tolerant of eutrophication is reported.

7. **BALVAY, G., J.-C. DRUART & M. LAURENT, 1990.** Second addition to the inventory of the plankton of Lake Leman. *Arch. Sci.* (Geneva) **43**, 159-166. <Address above.> Thirty-four phytoplankton species, 10 Rotifers and 3 Cladocera have been encountered for the first time in Lake Geneva. The presence is confirmed for 3 Rotifers and 3 Cladocera in the lake where *Notholca foliacea* seems to have disappeared more than 20 years ago.

8. **BAMSTEDT, U. 1990.** Trophodynamics of the Scyphomedusae *Aurelia aurita* predation rate in relation to abundamce, size and type of prey organism. *J. Plankt. Res.* **12**, 215-230. <Univ. Bergen, Dept Marine Biol., N-5065 Blomsterdalen, Norway.> Describes predation on phytoplankton, ciliates, the rotifer *Synchaeta* sp. and mixed zooplankton. Large medusae (> 45 mm diameter) consumed between 2000 and 3500 prey organisms day-l in prey concentrations exceeding 100 1-1. Results suggest that natural populations are usually food limited. The predicted predation rate at average prey concentrations that are characteristic of neritic environments cannot explain the maximum growth rates observed in field populations. It is therefore suggested that exploitation of patches of prey in high abundance is an important component in the trophodynamics of this species.

9. **BARMUTA, L.A., S.D. COOPER, S.K. HAMILTON, K.W. KRATZ & J.M. MELACK, 1990.** Responses of zooplankton and zoobenthos to experimental acidification in a high-elevation lake, Sierra Nevada, California, U.S.A. *Freshw. Biol.* **23**, 571-586. <L. Barmuta now at Dept. Zoology, University of Tasmania, Box 252C GPO Hobart, Tas. 7001, Australia.> In a 35-day enclosure experiment zooplankton, but not zoobenthos, was affected by acidification. *Daphnia rosea* and *Diaptomus signicauda* decreased, virtually disappearing below pH 5. *Bosmina longirostris* and *Keratella taurocephala* became more abundant with decreasing pH.

10. **BOLTOVSKOY, A., A. DIPPOLITO, M. FOGGETA, N. GOMEZ & G. ALVAREZ G, 1990.** (The Lobos Pond and its tributary: descriptive limnology with special reference to the plankton.) *Biol. Acuatica* **0**, 1-37. Rainfall is the key factor in modifying the ecological conditions in the pond. 181 planktonic and tycoplanktonic species were recorded; many of these are halophilous organisms. Discrimination was made between the species that dwell in the pond only, and those of lotic origin. Numerically the phytoplankton is dominated by blue-green algae, while the green algae and diatoms are the most diversified groups. Copepods and rotifers are the most abundant zooplankters; while highest numbers of species were yielded by the latter and the ciliates.

11. **CHUNG, C.E., H.B, YOO & S.Y. KIM, 1991.** Rotifera from Korean inland waters. II. Colurellidae (Rotifera: Monogononta). Korean J. Syst. Zool. **7**, 241-256. <Dep. Biol. Education, Chonnam Nat. Univ. Kwangju 500-757, Korea.> From 197 sites in South Korea, 9 species of the family Colurellidae were identified, 4 species (1 species and 3 subspecies) of which are new to the Korean fauna: *Colurella uncinata, Squatinella rostrum rostrum, Lepadella patella patella*, and *L. elliptica*. The total Korean Rotifera is now 165 species representing 13 families and 40 genera.

12. **CISNEROS, R., E.I. MANGAS & M. VAN MAREN, 1991.** Qualitative and quantitative structure, diversity and fluctuations in abundance of zooplankton in Lake Xolotlan, Managua. *Hydrobiol. Bull.* **25**, 151-156. <Centro Para la Investigacion en Recursos Acuaticos Nicaragua, Aptdo 4598, Managua, Nicaragua.> From 11 localities of Lake Xolotlan, 12 rotifers, 4 cladoceran and 5 copepods species were identified. Community diversity (Shannon-Wiener index) is low, viz. 0.83-2.20. At all times, copepods were the most abundant group. Rotifer densities were higher in zones influenced by rivers and organic pollution. Cladocerans were permanently present in low densities. Climatic events (rainfalls and dry periods) determined population fluctuations of the main zooplankton groups.

13. **CLAP, M.C. 1991.** Phytomicrofauna of pampasic lotic environments, Argentina. *Hydrobiologia* **220**, 137-146. <Inst. Limnol., Dr Raul A. Ringuelet, Univ. Nac. La Plata, Paseo Bosque S/N, 1900 La Plata, Argentina.> 12 rivers and streams of the Delta Sub-basin (Rio de la Plata estuary Basin, Argentina) were sampled 1985-1986 for microfauna associated with fifteen species of aquatic macrophytes. 171 species were identified, with ciliates and rotifers most abundant. Dissimilarities in the colonization of the macrophytes were demonstrated. Water level and current influenced the periphyton community and contributed to the differences observed.

14. **DARTNALL, H.J.G. 1990.** Nematodes as mountants for rotifer trophi. *Microscopy* (Lond.) **36**, 426-428. <Copper Beeches, 76 Lewes Road, Ditchling, Sussex BN6 8TY, UK.> Describes persistence of prey rotifer trophi in guts of carnivorous nematodes.

15. **DEBIASE, A.E., D.L. MAHONEY & B.E TAYLOR, 1990.** Trophic interactions in a wetland planktonic community: is bacteriovory important? *Bull. Ecol. Soc. Am.* **71** (2 SUPPL.), 135. <Savannah River Ecol. Lab., Aiken, S.C. 29801, USA.> 75th Annual Meeting of the Ecological Society pf America on Perspectives in Ecology: Past, Present and Future, Snowbird, Utah, USA, July 29-Au. 2, 1990.

16. **EMDADI, D. & C.H. BROGREN, 1990.** Effect of nitrogen variation in a two-stage continuous culture of algae and rotifer growth and lipid classes. *Oceanis* **16**, 409-418. <Sth. Marine Endoume, Rue de La Batterie Des Lions, 13007 Marseille, France.> No abstract available.

17. **FERNANDEZ-CASALDERREY, A., M.D. FERRANDO & E. ANDREUMOLINER, 1991.** Demographic parameters of *Brachionus calyciflorus* Pallas (Rotifera) exposed to sublethal endosulfan concentrations. *Hydrobiologia* **226**, 103-110. <Univ. Valencia, Fac. Biol. Sci., Dept. Anim. Biol. Anim. Physiol.,Dr Moliner 50, E-46100 Burjassot, Spain.> The effects of sublethal levels of endosulfan (0, 1, 1.5, 2.5 and 3.3 mg l-1) on the demography of the rotifer *Brachionus calyciflorus* were studied. Life expectancy at birth (e(o), net reproductive rate (R0), generation time (T) and intrinsic rate of natural increase (r) were significant differences between blank controls and controls with acetone. The effective endosulfan concentration at which a given parameter value was reduced to 50% of the controls (EC50) was calculated for life expectancy.

18. **FERNANDEZ-CASALDERREY, A., M.D. FERRANDO & E. ANDREU-MOLINER, 1992.** Acute toxicity of several pesticides to rotifer (*Brachionus calyciflorus*). *Bull. Env. Contam. Toxicol.* 48, 14-17. <Address above.> K/W: toxicology, insecticides, herbicides, rotifers, Brachionus calyciflorus, bioassay.

19. **FERNANDO, C.H., C. TUDORANCEA & S. MENGESTOU, 1990.** Invertebrate zooplankton predator composition and diversity in tropical lentic waters. *Hydrobiologia* **198**, 13-32. <Dept Biol., Univ. Waterloo, Waterloo, Ont. N2L 3G1, Canada.> Symposium on intrazooplankton predation, Sao Carlos, Sao Paulo, Brazil, May 29-June 3, 1989.

20. **FRIESEN, M.K. & J.A. MATHIAS, 1990.** Zooplankton of Dauphin Lake, Manitoba, Canada, 1982, 1983 and 1984. *Can. Manuscr. Fish. Aquat. Sci.* 0 (2083), I-IV, 1-6. <Central Arctic Region, Dep. Fisheries Oceans, Winnipeg, Manitoba R3T 2N6, Canada.> 21 samples, 1982, 1983 and 1984 from Dauphin Lake, Manitoba produced five copepod species, five cladoceran species and 13 rotifer genera. Although the density of rotifers fluctuated greatly during the season and the successional pattern varied from year to year, the mean density from one year to the next was similar; the overall mean for three years was 200.0 L^{-1}. Dominant rotifer genera were *Keratella*, *Polyarthra*, and *Conochilus*.

21. **FROLOV, A.V., S.L. PANKOV, K.N. GERADZE, S.A. PANKOVA & L.V. SPEKTOROVA, 1991.** Influence of the biochemical composition of food on the biochemical composition of the rotifer *Brachionus plicatilis*. *Aquaculture* **97**, 181-202. <Mariculture Lab., All-Union Res. Inst., Mar. Fishery Oceanogr., 17 V. Krasnoselskaya, Moscow 107140, Russia.> Positive correlations between the protein and lipid content of rotifers and the content of these compounds in their food were noted. No correlations were established for carbohydrates. The most significant and the least alterations occurred in the content of lipids and proteins, respectively. No correlations were found between the amino acid composition of rotifers and that of their food.

22. **FU, Y., Y. NATSUKARI & K. HIRAYAMA, 1990.** A preliminary study on genetics of two types of the rotifer *Brachionus plicatilis*. Proc. 16th U.S.-Japan meeting on Aquaculture, Charleston, Sth Carolina, Oct. 20-21, 1987. *NOAA (Nat. Oceanic Atmos. Admin.) Tech. Rept. NMFS* (Nat. Mar. Fish. Serv.) 0 (92), 13-20. <Fac. Fish., Nagasaki Univ., Bunkyomachi, Nagasaki 852, Japan.> No abstract available.

23. **FUJITA, S. & Y. HONMA, 1991.** (Induction of ovarian maturation and development of eggs, larvae and juveniles of the Puffer, Takifugu exascurus reared in the laboratory.) *Jpn J. Ichthyol.* **38**, 211-218. <16-13 Oomiyacho, Nagasaki 852, Japan.> Rotifers mentioned as food items for larvae. The hatched larvae were fed successively on rotifers *Brachionus plicatilis, Artemia* nauplii and minced fish meat, and reared for a period of about one year. Paper details development in Takifugu.

24. **GASOL, J.M., R. GUERRERO & C. PEDROS-ALIO, 1991.** Seasonal variations in size structure and procaryotic dominance in sulfurous Lake Ciso. *Limnol. Oceanogr.* **36**, 860-872. <Dep. Biol., McGill Univ., 1205 Dr. Penfield Ave., Montreal, Quebec H3A 1B1, Canada.> Size spectra are given for the planktonic community of Lake Ciso [Spain]. The average spectrum showed peaks of biomass at 0.5-0.7, 4, 15, 32, 64, 85, and 200 lm of equivalent spherical diameter. These peaks corresponded to the dominant organisms in the lake: heterotrophic bacteria, purple phototrophic bacteria, cryptomonads, ciliates, rotifers including *Anuraeopsis fissa*, and copepods. Both linear and polynomial equations were fitted to the normalized spectra. The lake alternated between anaerobic conditions during mixing, when procaryotes dominated and polynomial fits were best, and stratification, when polynomial and linear curves fit equally well.

25. **GASOL, J.M., F. PETERS, R. GUERRERO & C. PEDROS-ALIO, 1992.** Community structure in Lake Ciso: Biomass allocation to trophic groups and differing patterns of seasonal succession in the meta- and epilimnion. *Arch. Hydrobiol.* **123**, 275-303. <Dep. de Genetica Microbiol., Univ. Autonoma Barcelona, 08193 Bellaterra, Spain.> The community was characterized by the presence of purple phototrophic bacteria. Prokaryotes dominated during the winter but eukaryotes could account for up to 75% of the biomass in summer. The total amount of chemotrophic biomass was always lower (ranging from 25 to 50% of the total) than phototrophic biomass. Occasionally, rotifers explained 50% of the chemotrophic biomass in summer, while ciliates and copepods constituted 15-30% and 5-20%, respectively. Bacteria formed only 10-20% of the chemotrophic biomass in summer, but that accounted for almost 100% during winter holomixis.

26. **GONZALEZ, M.J. & T.M. FROST, 1992.** Food limitation and seasonal population declines of rotifers. *Oecologia* **89**, 560-566. <Miami Univ., Dept Zool., Oxford, OH 45056, USA,> *Keratella cochlearis* exhibited consistent seasonal abundance patterns during a four-year study in Little Rock Lake, Wisconsin, U.S.A. Spring population peaks were followed by strong summer reductions. There were reductions in rotifer egg ratios. *K. taurocephala* abundance patterns were similar during 1984 and 1985, but not in 1986 and 1987, when spring peaks and summer declines were not apparent. Summer declines in the egg ratio of *K. taurocephala* were observed each year. The reduction in rotifer populations simultaneously with decreased egg ratios suggested that population declines were caused by food limitation. Food-addition experiments conducted in situ in small enclosures indicated that food was limiting for *K. cochlearis* when its populations were declining, but not during other periods of the year. *K. taurocephala* did not show a consistent response to food addition.

27. **GOPHEN, M, S. SERRUYA & P. SPATARU, 1990.** Zooplankton community changes in Lake Kinneret, Israel, during 1969-1985. *Hydrobiologia* **191**, 39-46. <Yigal Allon Kinneret Limnol. Lab., P.O. Box 345, Tiberias, Israel 14102.> Int. Symp. on trophic relationships in inland waters, Tihany, Hungary, Sept. 1-4, 1987.

28. **GREEN, J. 1990.** Zooplankton association in Zimbabwe. *J. Zool.* (Lond.) **222**, 259-284. <Centre Res. Aquatic Biol., Queen Mary Coll., Mile End Rd, London El 4NS, U.K.> Thirty species of Rotifera and 20 species of Crustacea were identified from 18 Zimbabwean impoundments. The momentary species composition was similar to that given by Pennak (1957) for the world average, although the mean number of species of Copepoda was significantly lower. Comparisons with data from Brazil and Lake Maggiore indicate the need for a further geographical analysis. In impoundments of different sizes, over several orders of magnitude of area, the number of species of Cladocera and Copepoda shows a small increase, but the number of species of Rotifera shows a much larger and more variable increase.

29. **GUISANDE, C., J. TOJA & N. MAZUELOS N, 1991.** The effect of food on protein content in rotifer and cladoceran species: a field correlational study. *Freshw. Biol.* **26**, 433-438. <Dep. Ecol., Fac. Biol., Univ. Sevilla, Apo. 1095, 41080-Sevilla, Spain.> A positive relationship between protein content of individuals and protein in the food was found for all species examined. The increase in protein content of the animals was less pronounced when food was more abundant. When food concentration was lower, a greater reduction in protein content was observed in two species of rotifers than in four cladoceran species. Moreover, when comparing among species of Cladocera, the reduction in protein content at low food concentrations was more marked in the small-bodied than in the large-bodied species. These results are consistent with the size-efficiency hypothesis.

30. **GULATI, R.D. 1990.** Structural and grazing responses of zooplankton community to biomanipulation of some Dutch water bodies. *Hydrobiologia* **200/201**, 99-118. <Limnol. Inst., Rijksstraatweg 6, 3631 AC Nieuwershuis, Netherlands.>

31. **HANAZATO, T. 1991.** Effects of repeated application of carbaryl on zooplankton communities in experimental ponds with or without the predator *Chaoborus*. *Environ. Pollut.* **74**, 309-324. <Regional Envt Div., Natl Inst. Environ. Studies, Onagawa, Tsukuba, Ibaraki 305, Japan.> Results indicated differential sensitivity to carbaryl among cladocerans. In ponds with *Chaoborus*, rotifers dominated the zooplankton, probably because *Chaoborus* released rotifers from competition with cladocerans and calanoid copepods, which were eliminated by the *Chaoborus* predation. Repeated application of high-dose carbaryl did affect the rotifer community, decreasing the dominance of *Polyarthra trigla* and increasing that of *Keratella valga*. These rotifer species may differ in their sensitivity to carbaryl.

32. **HANSEN, B., P.J. HANSEN, & T.G. NIELSEN, 1991.** Effects of large, nongrazable particles on clearance and swimming behaviour of zooplankton. *J. Exp. Mar. Biol. Ecol.* **152**, 257-270. <Univ. Roskilde, Inst. I, Life Sci. & Chem., P.O. Box 260, 4000 Roskilde, Denmark.> Latex beads (diameters 45 lm) were used to mimic pelagic particle composition dominated by large nongrazable particles and to examine their effect on clearance and swimming behaviour of a tintinnid, *Favella ehrenbergii*, a rotifer, *Brachionus plicatilis*, a gastropod veliger, *Philine aperta*, and copepodites of *Acartia tonsa*. The ciliates and the rotifers were not sensitive to mechanical obstruction by the polystyrene beads. The gastropod veligers and the copepodites, however, change swimming behaviour by increasing sinking and jumping frequencies accompanied by a significant reduction in clearance. These observations imply that laboratory determined grazing rates may overestimate in situ grazing activity if larger, noningestible particles are present in the water column.

33. **HANSSON, S., U. LARSSON & S. JOHANSSON, 1990.** Selective predation by herring and mysids and zooplankton community structure in a Baltic Sea coastal area. *J. Plankt. Res.* **12**, 1099-1116. <Dep. Zool., Univ. Stockholm, S-106 91 Stockholm, Sweden.> Herring (*Clupea harengus*) and the mysid shrimp *Mysis mixta* fed almost exclusively on zooplankton, mainly copepods; estimated food consumption equalled or exceeded the summer copepodite production. Increases in rotifer and cladoceran abundances with increased primary production suggests effects of food supply. Predation may explain a pronounced daily vertical migration of the most predated copepods. They occurred in deeper water during the day, when the visually feeding herring were active, and moved closer to the surface at night when *M. mixta* left the botton, to forage in the water column.

34. **HAVENS, K.E. 1991.** Zooplankton dynamics in a freshwater estuary. *Arch. Hydrobiol.* **123**, 69-98. <Address above.> Rotifers (*Polyarthra, Brachionus* spp. and *Keratella cochlearis*), nauplii and small cladocerans (*Bosmina longirostris* and *Moina micrura*) were numerically dominant in the zooplankton of Old Woman Creek Estuary, Ohio. Zooplankton densities were high, coincident with a high biomass of nano (<20 lm) algae, and the numerical dominance by small herbivores which were readily available to carnivorous species. Zooplankton community structure was patchy between stations in the estuary. A downstream station contained a mixture of lake and estuary species during seiches; a vegetated station had a divers littoral cladoceran fauna. Frequent flushing events, high silt levels and fish predation were likely the major factors controlling zooplankton dominance in this freshwater estuary.

35. **HEERKLOSS, R., W. SCHNESE & B. ADAMKIEWICZCHOJNACKA, 1991.** Seasonal variation in the biomass of zooplankton in 2 shallow coastal water inlets differing in their stage pf eutrophication. *Int. Rev. ges. Hydrobiol.* **76**, 397-404. <Univ. Rostock, Fachbereich Biol., Freiligrathstr. 7-8, O-2500 Rostock, Germany.> Seasonal zooplankton dynamics of two coastal water inlets differing in their stage of eutrophication are compared. There are no clear differences between the two waters with respect to calanoid copepods, but they differ appreciably in terms of rotifer biomass. In the more eutrophic water the latter show a pronounced mass development in July. Bacterio-detrivorous rotifer species are important regulators in the ecosystem which compensates for productivity increases by intensifying heterotrophic destruction.

36. **HIRAYAMA, K. 1990.** A physiological approach to problems of mass culture of the rotifer. *NOAA Tech. Rep. NMFS* 0(85), 73-80. <Fac. Fisheries, Nagasaki Univ., Bunkyomachi, Nagasaki 852, Japan.> 15th US-Japan Meeting on Aquaculture, Kyoto, Japan, Oct. 22-23, 1986.

37. **HOPKINS, T.S. & B.A. BROWN, 1990.** Qualitative seasonal distribution of phytoplankton and zooplankton of Mobile Bay, Alabama, USA. *Am. Zool.* **30**, 114A. <Univ. Alabama, Tuscaloosa, Ala. USA.> Annual meeting of the American Society of Zoologists, American Microscopical Society, Animal Behaviour Society, The Crustacean Society, International Association of Astacology, and the Society of Systematic Zoology, San Antonio, Texas, USA, Dec. 27-30, 1990.

38. **INGOLE, B.S. & A.H. PARULEKAR, 1990.** Limnology of Priyadarshani Lake, Schirmacher Oasis, Antarctica. *Polar Rec.* **26**, 13-17. <Nat. Inst. Oceanogr., Dona Paula, Goa 403 00, India.> Priyadarshani, an oligotrophic lake in Schirmacher Oasis (Antarctica), was surveyed during the austral summers of 1984-85 and 1986-87 in limnological and benthic studies. Benthic microfauna included seven taxonomic groups, dominated numerically by protozoa, rotifera, nematoda, turbellaria, tardigrada, oligochaeta and mites. Faunal density was high in moss-associated sediments.

39. **JACKSON, D.C., A.V. BROWN & W.D. DAVIES W D, 1991.** Zooplankton transport and diel drift in the Jordan Dam tailwater during a minimal flow regime. *Rivers* **2**, 190-197. <Dept Wildlife & Fisheries, P.O. Drawer LW, Miss. State Univ., Miss. 39762. USA.> Zooplankton discharged into tailwaters provides a high quality food resource that can influence macroinvertebrate assemblages and fisheries potentials. During the Federal Energy Regulatory Commission relicensing process for Jordan Dam hydroelectric facilities (Coosa River, Alabama [USA]), tailwater flows became an issue because of their impact on the river's fisheries potentials. Rotifers were less affected than microcrustacea, which was numerically reduced by an average of 60-80% during transport through a braided river channel located in the upstream portion of the system.

40. **JENKINS, D.G. & A.L. BUIKEMA Jr, 1990.** Response of a winter plankton food web to Simazine. *Environ. Toxicol. Chem.* **9**, 693-706. <Dept Biol., Va. Polytech. Inst. State Univ., Blacksburg, VA. 24061, USA.> *In situ* microcosms of a winter plankton community were exposed for 21 d to 0.0, 0.1, 0.5 and 1.0 mg/L of the herbicide simazine, approximating persistent levels found after application in other systems. Phytoplankton were differentially affected by simazine. Rotifers dominated the zooplankton and were also differentially affected by simazine. The dominant species, *Kellicottia bostoniensis*, exhibited a positive response to simazine, as did *K. cochlearis*, due to lesser mortality in higher concentrations of simazine. *Polyarthra vulgaris* was unaffected, but *Synchaeta pectinata* was impaired by simazine at day 21. Zooplankton (primarily rotifers) may have fed on heterotrophic cells more than on autotrophic cells, and may have been more closely associated with the detrital food chain than the autotrophic food chain.

41. **KILLIS, G.W. & W.M. KOVEN, 1990. Preparation of oils enhanced in highly unsaturated fatty acid (HUFA) content by low temperature crystallization separation for rotifer** *Brachionus plicatilis* enrichment. *Aquaculture* **88**, 69-74. <Nat. Cen. Mariculture, Israel Oceanogr. & Limnol. Res. Ltd, P.O. Box 1212 Eilat 88112, Israel.> Capelin fish oil was used for low temperature crystallization separation to produce and enriched fraction with 50% more polyunsaturates. THe enriched fraction fed to rotifers produced a 3-fold increase in rotifer polyunsaturates.

42. **KIM, W., S.Y. MOON & M.O. SONG, 1991.** The systematic study on the freshwater Rotifera of Korea. *Korean J. Zool.* **34**, 548-556. <Dep. Mol. Biol., College of Nat. Sci., Seoul Nat. Univ., Seoul 151-742, Korea.> 24 freshwater sites in Korea were investigated. Eleven species and/or subspecies in three families of monogonont freshwater rotifiers were identified. Two species, *Notholca marina* and *Lecane (M.) stenroosi* were new to Korea. A key is given for 22 Korean sp./ssp. which have been described in this and previous taxonomic reports. Other taxa are: *Brachionus urceolaris*, *B. quadridentatus*, *N. labis*, *Platyias* quadricornis, *Mytilina mucronata*, *M. ventralis macracantha*, *Lepadella ovalis*, *Lecane ungulata* and *Trichocerca bicristata*.

43. **KIRK, K.L. & J.J. GILBERT, 1990.** Suspended clay and the population dynamics of planktonic rotifers and cladocerans. *Ecology* **71**, 1741-1755. <Biol. Dept, Alma Coll., Alma, Mich. 48801, USA.> The population growth rates of four rotifer species (*Brachionus calyciflorus*, *Keratella cochlearis*, *Polyarthra vulgaris*, and *Synchaeta pectinata*) were not affected by high concentrations of coarse or fine clay, even at very low food levels. The presence of suspended sediments in natural ecosystems, such as turbid lakes and reservoirs, should favor rotifers over cladocerans and thus influence the structure of zooplankton communities.

44. **KLEINOW, W., J. KLUSEMANN & H. WRATIL, 1990.** A gentle method for th preparation of hard parts (trophi) of the mastax of rotifers and scanning electron microscopy of the trophi of *Brachionus plicatilis* (Rotifera). *Zoomorphology* (Berl.) **109**, 329-336. <Zool. Inst., Univ. Koeln, Lehrstuhl Tierphysiologie, Weyertal 119, D-5000 Koeln 41, Germany.> Trophi of the rotifer *Brachionus plicatilis* were prepared by dissolving rotifer tissues and lorica with sodium dodecyl sulfate (SDS) and dithiothreitol (DTT) and were examined by scanning electron microscopy in order to obtain information on the functional morphology of these structures. The trophi are not composed of distinct parts but form a continuous structure of rigid pieces and connecting membranous regions. Structures and probable functions are detailed.

45. **KLEINOW, W., H. WRATIL, K. KUEHLE & B. ESCH, 1991.** Electron microscope studies of the digestive tract of Brachionus plicatilis (Rotifera). Zoomorphology (BERL.) 111, 67-80. <Address above.> Longitudinal sections through *B. plicatilis* were studied by TEM and SEM. The inner surfaces of both the "stomach" and the "intestine" are provided with rootless cilia, which show different densities, alignments, structures and properties in different compartments. The observations confirm the existence of functional differences between stomach and intestine. The structural features of the intestine indicate that small molecules may be transported through its wall and that here, perhaps, processes may take place which demand active transport.

46. **KLUSEMANN, J., W. KLEINOW & W. PETERS, 1990. The hard parts (trophi) of the rotifer mastax do contain chitin: evidence from studies on** *Brachionus plicatilis*. *Histochemistry* **94**, 277-284. The presence of chitin was confirmed by chitosan tests, thin-layer chromatography which revealed glucosamine, by dissolution with chitinase and by electron microscopy. **Chitin content was given as ca. 64%**

47. **KNUD-HANSEN, C.F., T.R. BATTERSON, C.D. MCNABB, Y. HADIROSEYANI, D. DANA & N.H.M. EIDMA, 1990.** Hatchery techniques for egg and fry production of *Clarius batrachus* (Linnaeus). *Aquacultue* **89**, 9-20. <Asian Inst. Technol., Agric. Food Eng. Div., G.P.O. Box 2754, Bangkok, 10501, Thailand.> Newly hatched fry of the walking catfish, *Clarias batrachus* (Linnaeus) fed with *Artemia* nauplii though day 8 (after hatching), an *Artemia*/cladoceran mix from days 9 to 16, and cladocerans only from days 17 to 23 resulted in over 90% survival of young from hatched eggs. Other diets examined (rotifers, cladocerans, ground fish meal, and ground Nile tilapia flesh) proved inadaquate for fry through day 16. Suggested guidelines are given for hatchery production of *C. batrachus* fry and fingerlings.

48. **LAAL, A.K. 1989 (1991).** Association of macroinvertebrates with macrophytes in some tropical ponds. *J. Inl. Fish. Soc. India* **21**, 20-25. <Central Inl. Capture Fisheries Res. Inst., Reservoir Div., 22, 1st Main, 4TH Block, Rajajinagar, Bangalore-560 010, India.> The macrophytes, pond depth and nature of bottom soil play vital roles in variations in populations and communities of associated invertebrate fauna. Such variations reflect their habits and trophocity of ponds. Certain macro-invertebrates were found to have affinities with certain macrophytes only. Protozoa (*Zoogloea* spp.) were found associated with *Vallisneria* sp. and rotifers (*Floscularia* spp. and *Spirostomum* spp.) with decayed leaves and roots of *Eichhornia crassipes*.

49. **LAIR, N. 1990.** Effects of invertebrate predation onthe seasonal succession of a zooplankton community: a two year study in Lake Aydat, France. *Hydrobiologia* **198** (O) 1-12. <Univ. Blaise Pascal, Hydrobiol. Des Eeax Douces, 63177 Aabiere Cedex, France.> Symposium on Intrazooplankton predation, Sao Carlos, Sao Paulo, Brazil, May 29-June 3, 1989.

50. **LEEUWEN, C.J. VAN, P.T.J. VAN DER ZANDT, T. ALDENBERG, H.J.M. VERHAAR & J.L.M. HERMENS, 1992.** Application of QSARS extrapolation and equilibrium partitioning in aquatic effects assessment I. Narcotic industrial pollutants. Environ. Toxicol. Chem. 11, 267-282. <Directorate-General for Environmental Protection, P.O. Box 450, 226 MB Leidschendam, Netherlands.> Quantitative structure-activity relationship (QSAR) estimates of toxicity of narcotic chemicals for 19 species of bacteria, algae, fungi, protozoans, coelenterates, rotifers, molluscs, crustaceans, insects, fish, and amphibians were used to predict no-effect levels (NELs) at the ecosystem level by means of recently developed extrapolation methods. A simple table is given from which NELs for narcotic chemicals for water, sediment, and residues in biota can be predicted on the basis of only the octanol/water partition coefficient and molecular weight. The method may be applied to setting quality criteria for the aquatic environment and to ecotoxicological interpretation of (bio)monitoring data. Calculations were carried out for 102 narcotic compounds.

51. **LEU, M.-Y., C.-H. LIOU & C.-H. WU, 1991.** Feasibility of using micro-coated diet fed to larval yellow-finned black porgy *Acnthopagrus latus* Houttuyn. *J. Fish. Soc. Taiwan* **18**, 287-294. <Preparatory Office, Kaohsiung Branch, Natl Mus. Mar. Biol.-Aquarium, Kaohsiung, Taiwan 802.> A 20-day experiment was conducted to examine the feasbility of feeding yellow-finned black porgy Acanthopagrus latus larvae with micro-coated diet (MCD). 4 dietary regimens including rotifer, *Brachionus plicatilis* are detailed. The best survival rate was obtained from larvae fed 67% MCD and 33% live foods (20.8%). The results indicated that the growth and survival of the larvae could be improved by employing MCD and supplemented with a relatively small amount of live food. Prepared MCD can replace a great portion of the conventional live foods used in yellow-finned black porgy larval culture.

52. **LUESSE, B. & J. CLASEN, 1991.** Studies on the planktonic rotifer *Notholca caudata* with regard to drinking water purification. *Aqua* (Oxf.) **40**, 380-384. <Landesamt Fuer Wasser-Wirtschaft, Am Zollhafen 9, W-6500 Mainz I, Germany.> The removal of zooplankton during drinking water purification is dependent on shape, size, and mobility of the organism. *Notholca caudata* was found to have a very low removal rate at the Wahnbach reservoir. Results from field investigations and laboratory scale experiments gave some data on life cycle, food and temperature preference. These data are the basis for a discussion on interaction mechanisms during flocculation and filtration processes in water purification.

53. **MACISAAC, H.J. & J.J. GILBERT, 1990.** Does exploitative or interference competition from *Daphnia* limit the abundance of *Keratella* in Loch Leven, Scotland, U.K.? A reassessment of May and Jones, 1989. *J. Plankt. Res.* **12**, 1315-1322. <Dept of Zoology, Erindale Coll., Univ. of Toronto, Mississauga, Ont. L5L 1C6, Canada.>

54. **MANGAS, E. & H. GARCIA, 1991.** Seasonal fluctuations of zooplankton biomass in Lake Xolotlan, Managua. *Hydrobiol. Bull.* **25**, 157-162.<Centr. Para Invest. Rec. Aquat. Nicaragua, Aptdo 45998, Managua, Nicaragua.> Seasonal fluctuations of zooplankton biomass (dry weight) were determined during a year in two localities of Lake Xolotlan (Managua) [Nicaragua]. Biomass estimations of the most common species of rotifers, cladocerans and copepods were made. Maximal zooplankton biomass was observed in February-April (dry season) in coincidence with the period of highest phytoplankton abundance. Copepods contributed with 78% and 84% to the mean zooplankton biomass at points 1 and 7, respectively. Cladocera biomass was lowest, probably controlled by fish predation. Development of rotifer biomass was more intense during the rainy season, when detritus particles were more abundant. Daily fluctuations of zooplankton biomass were not pronounced.

55. **MANUEL, J. DE & R.J. SHIEL, 1991.** Biodiversity in billabongs: the rotifers of floating *Azolla* and *Ricciocarpus* mats. Australian Society for Limnology Conference, 12-15 July 1991, Lorne Vic., Abstracts. <MDFRC, P.O. Box 921, Albury, NSW 2640, Australia.> Floating mats of a fern (*Azolla pinnata*) and a liverwort (*Ricciocarpus natans*) on a River Murray billabong were investigated for communities of sessile and free swimming rotifers. Species richness was significantly higher on the scales of *R. natans* when both plants co-occurred. Species richness and abundance of the rotifer community in *Azolla* increased progressively as *Ricciocarpus* senesced and *Azolla* became predominant in the pleuston. Community complexity is related to habitat heterogeneity and individual species' mobility.

56. **MATSUMURA-TUNDISI, T., A.C. RIETZLER, E.L.G. ESPINDOLA, J.G. TUNDISI & O. ROCHA, 1990.** Predation on *Ceriodaphnia cornuta* and *Brachionus calyciflorus* by two *Mesocyclops* species coexisting in Barra Bonita Reservoir, Soa Paulo, Brazil. *Hydrobiologia* **198** (O), 141-152. <Lab. De Limnologia, Dep. Ciencias Biologicas, Univ. Fed. De Sao Carlos, Sao Paulo, Brazil.> Symposium on Intrazooplankton predation, Sao Carlos, Sao Paulo, Brazil, May 29-June 3, 1989.

57. **MCCORMICK, P.V. & J. CAIRNS Jr, 1991.** Effects of micrometazoa on the protistan assemblage of littoral food web. *Freshw. Biol.* **26**, 111-120. <Dep. Biol., Elizabethtown College, Elizabethtown, PA. 17022-2298, USA>. Effects of rotifers and of rotifers/cladocerans/copepods on the abundance and composition of co-occurring, substrate-associated protistan assemblages were assessed by selectively transferring these groups from a small pond to laboratory microcosms. Significant changes in the dominance of different protistan groups were observed within 7 days, including a substantial decrease in the abundance of larger omnivorous and bactivorous Protozoa, mostly ciliates, and dominant algal taxa, an increase in the abundance of heterotrophic microflagellates. Interactions indicated in this study may alter both quantitative and qualitative aspects of energy flow and mineral cycling in benthic food-webs and be part of a large trophic-cascade involving other Metazoa such as fish.

58. **NAGATA, W.D. & J.N.C. WHYTE, 1992.** Effects of yeast and algal diets on the growth and biochemical composition of the rotifer *Brachionus plicatilis* Muller in culture. *Aquacult. Fish. Manag.* **23**, 13-21. <Fisheries Oceans Canada, Biol. Sci. Branch, Pacific Biol. Stn, Nanaimo, B.C. V9R 5K6, Canada.> Growth rates and fecundity of *Brachionus plicatilis* fed baker's yeast, a diatom, and three different flagellates, were monitored during a 15-day feeding trial. The highest growth rate and mean fecundity were exhibited by rotifers fed *Chlorella saccharophila*, followed in decreasing order by those fed *Isochrysis galbana* (T-Iso), *Tetraselmis suecica, Saccharomyces cerevisiae* and *Thalassiosira pseudonana*.

59. **OLMEDO, M.I., J. IGLESIAS, J.B. PELETEIR0, R. FORES & A. MIRANDA, 1990.** Acclimatization and induced spawning of sardine (*Sardina pilchardus* Walbaum) in captivity. *J. Exp. Mar. Biol. Ecol.* **140**, 61-68. <Centr. Cost. Inst. Espanol Oceanogr. de Vigo, Aptdo 1.552, 36280 Vigo, Spain.> Acclimatized sardines had an overall survival of 39.5%. They adapted to dry commercial pellets of 500 Im diameter within 3 days of capture. Larvae obtained showed a positive response to living food consisting of *Isochrysis galbana* Parke and *Brachionus plicatilis* Muller.

60. **OVIE. S.I. 1991.** Seasonal patterns in the zooplankton community of Round Valley Reservoir, Hunterdon County, New Jersey, USA. *Bull. N.J. Acad. Sci.* **36**, 1-10. <Limnol. Div., Natl Inst. Freshw. Fish. Res., P.M.B. 6006, New Bussa, Kwara State, Nigeria.> Twelve species of zooplankton were identified in the reservoir, incl. *Cyclops bicuspidatus, Diaptomus* sp., *Daphnia galeata mendoate, Daphnia ambigua, Bosmina longirostris, Chydorus sphaericus, Kellicottia longispina, Keratella cochlearis, K.*

quadrata, *Asplanchna* sp., *Polyarthra* sp. and *Filinia* sp. There was virtually no habitat specificity, since all identified species of zooplankton were found in the littoral and pelagic areas of the reservoir except the cladoceran *Chydorus sphericus* which was found only in the hypolimnion of the pelagic zone.

61. **PACE, M.L., G.B. MCMANUS & S.E.G. FINDLAY, 1990.** Planktonic community structure determines the fate of bacterial production in a temperate lake. *Limnol. Oceanogr.* **35**, 795-808. <Inst. of Ecosystem Studies, N.Y. Bot. Garden, Box AB, Millbrook N.Y. 12545, U.S.A.> Growth rates were measured by the incorporation of ^{3}H-thymidine into DNA. Grazing rates on bacteria were determined with small cells produced by a mutant strain of *Escherichia coli* and made either fluorescent or radioactive to monitor feeding. Bacterial community turnover times ranged from 1.5 to 16 d. Most bacterial cocmmunities appear to have turnover times > 1 d. The fate of bacterial production depends on planktonic community structure. Flagellates were the primary consumers of bacteria in winter and fall. At other times, *Daphnia galeata* consumed most of the bacterial production, breaking the microbial loop and funnelling bacterial production to higher consumers. Ciliates and rotifers were never important bacterial grazers.

62. **PALMER, M.A., A.E. BELY & K.E. BERG, 1992.** Response of invertebrates to lotic disturbance: a test of the hyporheic refuge hypothesis. Oecologia (Heidelb.) 89, 182-194. <Address above.> Stream ecologists have assumed that recovery is facilitated by behavioral migrations during floods down into the hyporheic zone (the interstitial spaces of a streambed) to seek temporary refuge from possible erosion (the "hyporheic refuge hypothesis"). Field observations of the response of meiofaunal invertebrates to floods, and field and flume experiments, demonstrated that 50-90% of the fauna was lost from the bed despite the fact that the depth of scour (10-30 cm) was significantly less than the total depth of the hyporheic zone (50 cm). Only rotifers moved deeper into the bed at higher flows. We conclude that, even though small-scale (cm's) migrations into the streambed in response to increased flow may be observed for some taxa and the hyporheic zone may serve as a partial source of colonists following disturbances, movements down are not adequate in preventing significant losses of meiofauna during floods.

63. **PAPINSKA, K. 1990.** Abundance and composition of rotifers in Vistula River. *Pol. Arch. Hydrobiol.* **37**, 449-460.<Hydrobiol. Dept., Inst. Zool., Warsaw Univ., Nowy Swiat 67, 00-046 Warsaw, Poland.> The occurrence of rotifers along a 100-km middle fragment of the Vistula River was investigated. Species of *Brachionus* accounted for 41-94.3% of the numbers of total Rotifera. The effect of food abundance on the density of dominant species was discussed.

64. **PAVELIEVA, E.B.** 1990. The trophic relation in the microzooplankton community. *Ergebn. Limnol.* 0(34), 257-262. <Zool. Inst., Acad. Sci., 199034 Universitetskaia Nab. 1, Leningrad, Russia.> 4TH Int. WOrkshop on the Measurement of Microbial Activities in the Carbon Cycle in Aquatic Ecosystems. Ceske Budejovice, Czeckoslovakia, 1988.

65. **PENALOZA, R., M. ROJAS, I. VILA & F. ZAMBRANO, 1990.** Toxicity of a soluble peptide from *Microcystis* sp. to zooplankton and fish. *Freshw. Biol.* **24**, 233-240. <Univ. Chile, Fac. Ciencias, Dep. Biologia Casilla 653, Santiago, Chile.> A soluble *Microcystis* cell fraction lethal to *Daphnia magna* was isolated by the disruption of net phytoplankton from eutrophic Aculeo Lake. Our results suggest that releases of a toxic peptide from *Microcystis* sp. may be the cause of massive fish kills at the study site, Aculeo Lake.

66. **POURRIOT, R. & C. ROUGIER, 1991.** (Volumetric importance of the eggs in planktonic rotifers). *Ann. Limnol.* **27**, 15-24. <Univ. Paris 6, Lab. Geologie Appliquee, B 123, F-75252 Paris Cedex, France.> The relationships between amictic egg volume (Vo) and adult female volume (VA) for 15 rotifer species are discussed. In the herbivorous rotifers, the allometric relationship is described by the following equation: Vo = 3.62 vo0.816. The exponent of the equation is close to the general value of 0.75. Similarly to the interspecific relationships, the egg volume ratios vary within a rotifer species (e.g. *Brachionus calyciflorus*). These relationships differ in the ovoviviparous genus Asplanchna, with a relative dry mass content (4% of the fresh weight), notably lower than that observed in other species. Similar allometric relations have also been found between the volume of resting eggs or of male eggs and the volume of their mothers in seven and three of the previous species respectively. Some differences are interpreted as resulting from various selective constraints.

67. **RAGHAVAN, S.L., N.G.S. RAO & M.F. RAHMAN, 1986 (1990).** Hydrobiological investigations in two perennial ponds of Anekal Taluk, Karntaka. J. Inl. Fish. Soc. India 18, 52-59. <Cent. Inst. Freshw. Aquaculture, No. 51, IVth Main, Malleswaram, Bangalore-560 003, Karntaka.> Two perennial village ponds near Bangalore were studied. The ponds showed low phosphate concentration in presence of iron in ferric state. Direct correlation was observed between turbidity and ferric iron. Surface runoff and leachings chiefly contributed to the productivity of the ponds. Zooplankton population was fairly high (average 280 u l-1) compared to that of phytoplankton. Diatoms among phytoplankton and rotifers among zooplankton dominated in the ponds.

68. **RASK M. 1991.** Iso Valkjarvi research: an introduction to a multidisciplinary lake liming study. *Finn. Fish. Res.* **12**, 25-34. <Finn. Game Fish. Res. Inst., Evo State Fish. Aquacult. Res. Stn., SF-16970 Evo, Finland.> Iso Valkjarvi, an acidified and mesohumic forest lake of 4.2 ha, was divided in two with a plastic curtain in April 1991 and limed in May 1991. Pre-liming, phytoplankton biomass was dominated by a raphidophycean *Gonyostomum semen* almost all summer. Algae from the groups Dinophyceae, Chrysophyceae and Conjugatophyceae were also abundant. *Asplanchna priodonta*, *Kellicottia longispina* and *Polyarthra* spp. were most abundant rotifers whereas *Bosmina longispina* and *Ceriodaphnia quadrangula* dominated the crustacean zooplankton fauna. Chironomidae, Ephemeroptera and Trichoptera were the most abundant groups of zoobenthos. The marking and recapturing of perch resulted in a population estimate of 11,150 fish. More than half of the perch were in the length group 11-12.9 cm. Crustacean zooplankton and chironomid larvae and pupae made up 70-80% of the perch diet.

69. **RIDDER, M. DE 1991.** Rotifers from Algeria. *J. Afr. Zool.* **105**, 473-484. <Lab. Ecol. Dieren, Zoogeog. Natuurbehoud, Rijksuniv. Gent, B-9000 Gent, Belgium.> From four expeditions between 1976 and 1978, the number of rotifer taxa known from Algeria is raised from 37 to 131. 68% of them are cosmopolitan, 20% are thermophilous with large distribution and 12% pansubtropical-pantropical. Moreover, nine of them are new to Africa or to science. [*Brachionus bidetatus* var. *ambidentatus* var. nov., *Platyias leloupi* var. *aspina* var. nov., *Dicranophorus hercules*, *Lecane plesia*, *L. levistyla* var. *depressa*, *L. luna* var. *submagna*, *L. ungulata* var. *magna*, *Lepadella lata raja* and *Lophocharis najas*]. For some species, biogeographical indications are given.

70. **RIDDER M. DE, 1991.** Additions to the annotated checklist of non-marine rotifers from African inland waters. Rev. Hydrobiol. Trop. 24, 25-46. <Lab. voor Ecol. der Dieren, Zoogeog. en Natuurbehoud, Rijksuniv. Gent, B-9000-Gent, Belgium.> A list of papers dealing with Rotifer investigations in African inland waters is compiled. All publications dealing with African Rotifers published between 1985 and 1989 are analyzed and the

data classified by country. We have added also some older data, which do not figure in our "Checklist" of 1986.

71. **ROTHHAUPT, K.O. 1990.** Population growth rates of two closely related rotifer species: effects of food quantity, particle size and nutritional quality. *Freshw. Biol.* **23**, 561-570. <Inst. Lake Res. Fisheries, Untere Seestr. 81, D-7994 Langenargen, Germany.> *Brachionus calyciflorus* and *B. rubens* were fed several algal species. Effects of food quantity were described by a modified Monod model. Nutritional value of the various algae is described.

72. **RUMENGAN, I.F.M., H. KAYANO & K. HIRAYAMA, 1991.** Karyotypes of S-type and L-type Rotifers *Brachionus plicatilis* MULLER, O.F. *J. Exp. Mar. Biol. Ecol.*, **154**, 171-176 <Nagasaki Univ., Fac. Fisheries, 1-14 Bunkyo Machi, Nagasaki, 852, Japan.> A comparative study on the karyotypes of S and L types of the rotifer *B. plicatilis* showed that the two karyotypes differed in chromosome number and morphology. The female diploid embryo of the S type had 25 chromosomes (2n = 25), whereas that of L type had 22 chromosomes (2n = 22). The chromosome numbers of male haploid embryos of S and L types were n = 12 and 11, respectively. Differences in karyotypes suggest that S and L types are so differentiated they should be considered different species. The possible evolutionary steps of chromosomes changes leading to the two types are discussed.

73. **RUYTER VAN STEVENINCK, E.D. DE, B. VAN ZANTEN & W. ADMIRAAL,** 1990. Phases in the development of riverine plankton: examples from the rivers Rhine and Meuse. *Hydrobiol. Bull.* **24**, 47-56. <Nat. Inst. Public Health & Envt. Protection, P.O. Box 1, 3720 BA Bilthoven, Netherlands.> Observations on phyto- and zooplankton in two hydrographically different rivers were compared in order to discriminate phases in plankton development. The differences in the timing of plankton growth in the two rivers are probably caused by differences in flow regime between both rivers.

74. **RUYTER VAN STEVENINCK, E.D. DE, W. ADMIRAAL & B. VAN ZANTEN, 1990.** Changes in plankton communities in regulated reaches of the lower River Rhine. *Regul. Rivers Res. Manag.* 5, 67-76. <Address above.> The Dutch section of the Lower Rhine is highly regulated, which seriously affects sedimentation of suspended material. During 1987 phytoplankton biomass (primarily diatoms) showed typical spring and summer peaks and also decreased in the investigated river reach. In contrast, zooplankton developed a higher biomass due to an increase in the numbers of rotifers, crustaceans, and molluscan larvae, whereas arcellas and ciliates decreased in numbers. It is concluded that the Rhine, after flowing more than 800 km, meets in its delta the proper conditions for a true plankton community to develop: settling and trophic interactions become of increasing importance in determining the structure of plankton communities.

75. **SAINT-JEAN, L. & M. PAGANO, 1990.** Night and day variations in the vertica distribution of zooplankton and net collecting efficiency in Ebrie Lagoon, Ivory Coast. *Hydrobiologia* **194**, 247-265. <Centre ORSTOM, BP 5045, F-34032 Montpelier Cedex, France.> Vertical distribution and night and day collecting efficiencies of both nets and a Schindler trap, were studied in two shallow (4m) unstratified bays of the Ebrie Lagoon. Some of the organisms migrate. Distribution of the plankton community, including rotifers, is described.

76. **SAWADA, M. & J.C. CARLSON, 1990.** Biochemical changes associated with the mechanism controlling superoxide radical formation in the aging rotifer. *J. Cell Biochem.* **44**, 153-166. <Lady Davis Inst. Med. Res., McGill Univ., 3755 Chemin Cote Ste-Catherine, Montreal, Quebec H3T IE2, Canada.> Levels of the superoxide radical (SOR) and lipid peroxides were measured and found to increase during aging in the short-lived rotifer, *Asplanchna brightwelli*. The results of this study indicate that levels of the SOR and lipid peroxides are coupled to rotifer life-span and that activation of phospholipase A2 may contribute to the elevation of these agents in older animals.

77. **SAWADA, M., J.C .CARLSON & H.E. ENESCO, 1990.** The effects of UV radiation and antioxidants on life span and lipid peroxidation in the rotifer *Asplanchna brightwwelli. Arch. Gerontol. Geriatr.* **10**, 27-36. <Dept Biol., Univ. Waterloo, Waterloo, Ont. N2L 3GI, Canada.> Lipid peroxidation (LP) rates and life span were determined in control and in ultraviolet (UV) irradiated rotifers of *A. brightwelli*. Results indicate that the decrease in life span caused by UV radiation may be mediated through the production of lipid peroxides.

78. **SCHLOTT-IDL, K. 1991.** Development of zooplankton in fishponds in the Waldviertel, Lower Austria. *J. Appl. Ichthyol.* **7**, 223-229. <Okol. Stn Waldviertel, Gebharts 54, A-3942 Schrems, Austria.> The zooplankton of 13 ponds located in the Waldviertel region (Lower Austria) was examined at about 10-day intervals. The mean biomass of Cladocera and Copepoda reached its maximum in July, Rotifera in September (1.8 mg/L), simultaneously with Ciliata (0.9 mg/L). In ponds where fish production was low, the low feeding pressure by the fish stock resulted in a high biomass of Cladocera, which formed up to 89% of the total zooplankton biomass. The analyses of zooplankton development, together with data on water quality, type of feed, intensity of feeding and fish shock density may facilitate the interpretation of production processes in managed fish ponds.

79. **SCHMID-ARAYA, J.M. & L.R. ZUNIGA, 1992.** Zooplankton community structure in two Chilean reservoirs. *Arch. Hydrobiol.* **123**, 305-335. <Biol. Station Lunz, Inst. Fuer Limnol., A-3293 Lunz am See, Austria.> From Sept. 1983 - Nov. 1984 different zooplankton assemblages were recorded in two reservoirs, 41 species in Penuelas (70.7% rotifers, 22.0% cladocerans and 4.9% copepods) compared to 21 species in Rungue (81.0% rotifers, 9.5% cladocerans and 9.5% copepods). Average abundance, diversity and species richness were more variable in Rungue: a bloom of rotifers suggested a "disturbance" of the zooplankton community, caused probably by the unstable conditions created by the annual water renewal. In Penuelas the assemblage varied much less. The predominance of rotifers (few species with high abundances) and low zooplankton diversity values characteristic in Rungue, suggest that this reservoir is either at an early phase on the evolution of its zooplankton community, or reflects a disturbed community when compared to the other reservoir.

80. **SCHNEIDER, D.W. 1990.** Direct assessment of the independent effects of exploitative and interference competition between *Daphnia* and rotifers. *Limnol. Oceanogr.* **35**, 916-922. <Cent. For Limnol., Univ. Wisconsin-Madison, 680 N. Park St., Madison, WI 53706, USA> The effects of interference were separated from exploitative competition by *Daphnia pulex* on *Keratella cochlearis* and *K. crassa*. At both high and low food levels, *K. cochlearis* is strongly affected by interference campetition but not exploitative competition, and *K. crassa* shows no evidence of suppression by *Daphnia* through interference competition. These results suggest that laboratory studies examining the effects of *Daphnia* on rotifers are correct in attributing much of the reduction in rotifer numbers to direct interference competition.

81. **SCRUTON, D.A., R. CHENGALATH, J.C.H. CARTER & W.D. TAYLOR, 1991.** Distribution of planktonic rotifers and crustaceans in 108 lakes from insular Newfoundland. *Can. Tech. Rep. Fish. Aquat. Sci.* 0(1825), I-IV, 1-83. <Sci. Branch, Dep. Fisheries Oceans, P.O. Box 5667, St. John's, Newfoundland, A1C 5X1, Canada.) 108 were sampled in the summer and fall of 1991 for morphometry, chemistry and zooplankton populations as part of DFO's (Department of Fisheries and Oceans)

National Inventory Survey (NIS) conducted under the Departmental acid rain program. Data collected in this study are used to investigate relationships between lake characteristics (morphometric and chemical properties) and zooplankton distributions and associations on the island of Newfoundland. A particular focus of the evaluation was to attempt to identify variables related to the long range transport of air pollutants (LRTAP) and the possible influence of these parameters on zooplankton. Attention is also paid to the zoogeography of zooplankters in the region in this and other studies to provide a comprehensive baseline for future limological research.

82. **SEGERS, H., A.O. AJAYI, G.Y. CHIAMBENG, H.P. CHUAH, M. DELCASTILLO, M.G. DIRECTO, M.L. DE CRUZ, L. MORENO, A.L. OLIVEIRANETO & Y.R. WIDYASTUTI, 1991.** 14 rotifer species new to the Belgian fauna, with nomenclatural and taxonomical remarks on some Squatinella species. Belg. J. Zool. 121, 193-201. <State Univ. Ghent, Ecol. Dieren Lab., K.L. Ledeganckstr. 35, B-9000 Ghent, BELGIUM.> Forty-four rotifer species, of which fourteen are new to the Belgian fauna, were obtained from samples collected in the Botanical garden of the State University of Ghent (Belgium). Seven are thermophilous and found only in a pool in a hothouse, but the remaining seven represent still a remarkably high number of additional species to the Belgian fauna. This can only be explained by the fact that most research efforts on Rotifera in Belgium were focussing on planktonic habitats. Nomenclatorial and taxonomical remarks on some Squatinella species are added.

83. **SEGERS, H. 1991.** Nomenclatural note on a primary homonym in the genus Lecane (Lecanidae: Rotifera). Rev. Hydrobiol. Trop. 24, 77.<Lab. Voor Ecol. der Dieren, Zoogeog. en Natuurbehoud, K.L. Ledeganckstraat 35, B-9000 Gent., Belg.>

84. **SHARMA, B.K. 1990.** The genus *Testudinella* (Eurotatoria: Gnesiotrocha: Testudinellidae) in North-Eastern India. *Hydrobiologia* **199**, 29-34. <Dep. Zool., North-Eastern Hill Univ., Shillong-793014, India.> Nine species and subspecies of the genus *Testudinella* are reported from North-Eastern India. Of these, six are new to India and eight to the North Eastern region. Remarks are made on their distribution. [The following specis are discussed: *Testudinella brevicaudata*, *T. parva parva*, *T. parva bidentata*, *T. tridentata*, *T. greeni*, *T. parva semiparva*].

85. **SHIEL, R.J. & W. KOSTE, 1992.** Rotifera from Australian inland waters. VIII. Trichocercidae (Monogononta). Trans. R. Soc. Sth Aust. 116, 1-27. Diagnostic keys and figures are given to the species of *Ascomorphella* (1 sp.), *Elosa* (1 sp.) and *Trichocerca* (43 spp.) known from Australian inland waters. Caution is advised on the use of European keys.

86. **SLOTERDIJK, H., L. CHAMPOUX, V. JARRY, Y. COUILLARD & P. ROSS, 1990.** Bioassay responses of microorganisms to sediment elutriates from the St Lawrence River, Lake St Louis, Quebec. *In* Munawar, M. *et al.* (Eds). *Developments in Hydrology* 54 "Environmental Bioassay techniques and their application". Kluwer Academic Publishers, Dordrecht: 317-336.

87. **SMITH, B.B. & C.B. REIF, 1991.** Microscopic flora and fauna of Bear Lake Pennsylvania 1985-1989. *J. Pa. Acad. Sci.* **65**, 75-79. <4917 Colonial Dr., Nacogdoches, TX 75961, USA.> The phytoplankton, 1985-1989, consisted principally of the chrysophytan genera *Dinobryon*, *Synura*, and the pyrrophytan genus *Peridinium*. The zooplankton was composed mainly of the rotiferan genera *Asplanchna*, *Kellicottia*, and *Keratella*, while the great bulk of the zooplankton consisted mainly of adults and immature forms of *Diaptomus minutus*. Lists are presented of (1) genera identified by various authors in different years, (2) the genera identified by the present authors in different years, (3) the species identified by the present authors from collections made at various times, and the forms found in squeezes but not in the plankton. The introduction of lime into Bear Lake and its possible effect are discussed.

88. **SNELL, T.W. & M.A. NACIONALES, 1990.** Sex pheromone communication in *Brachionus plicatilis* (Rotifera). *Comp. Biochem. Physiol. A Comp. Physiol.* **97**, 211-216. <Div. Sci., Univ. Tampa, Tampa, Fl. 33606, USA.> A mate recognition bioassay using the rotifer *Brachionus plicatilis* is described that permits investigation of the molecular nature of chemical communication between females and males.

89. **SPRULES, W.G. & M. MUNAWAR, 1991.** Plankton community structure in Lake St Clair, 1984. *Hydrobiologia* **219**, 229-238. <Dept Zool., Univ. Toronto, Erindale College, Mississauga, Ont. L5L 1C6, Canada.> Of the St Lawrence Great Lakes, Lake St. Clair zooplankton biomass is second only to that of Lake Erie. Biomass size spectra are typical for mesotrophic lakes but low explained variance in the annual normalized spectrum is indicative of a perturbed system. Since 1972/1973 there appears to have been a slight decrease in zooplankton abundance accompanied by a shift from dominance of rotifers to dominance of cladocerans. We hypothesize that high flushing rate and seasonal variability coupled with contaminant loadings have resulted in a plankton community reduced in taxonomic diversity and dominated by small-bodied species.

90. **TANAKA, Y., Y. MUKAI, K. TAKII & H. KUMAI H, 1991.** Chemoreception and vertical movement in planktonic yolk-sac larvae of Red Sea bream (*Pagrus major*). *J. Appl. Ichthyol.* **7**, 129-135.<Dept Fisheries, Fac. Agric., Kinki Univ., Nakamichi, Nara City, Nara 631, Japan.> At the moment of hatching, the larvae already have receptor cells with several cilia arranged radially in their open nostrils. Thus it is likely that by means of their vertical movement they are capable of sensing thin layers of concentrated food extract (rotifer, *Brachionus plicatilis*). We suggest that planktonic larvae of *Pagrus major* are capable of detecting and remaining within food patches even before the onset of feeding. The onset of food detection in the earlier stages may be, to some extent, the more efficient strategy for larval survival and growth because this ability could contribute to a reduction in energy consumption.

91. **TESSIER, A.J. & R.J. HORWITZ, 1990.** Influence of water chemistry on size structure of zooplankton assemblages. *Can. J. Fish. Aquat. Sci.* **47**, 1937-1943. <Michigan State Univ., W. K. Kellogg Biol. Stn, Dept. Zool., Hickory Corners, Mich. 49060, USA.> 146 lakes were sampled. There was no significant variation in total zooplankton abundance among regions or alkalinity categories; however, the body-size structure of assemblages was dependent on both alkalinity and geographic subregion. This shift of size structure was caused by a loss of large-bodied zooplankton and an increase in small rotifers with decreasing water hardness. We hypothesize that the association of large zooplankton with hard water is casual; large-bodied cladocerans may require high calcium levels.

92. **TREASURER, J.W. 1990.** The food and daily food consumption of lacustrine 0-plus perch (*Perca fluviatilis* L.). *Freshw. Biol.* **24**, 361-374. <P.O. Box 2, Lochailort, Inverness-shire PH38 4LZ, Scotland.> The diet and daily food consumption of 0+ perch were investigated in two shallow Scottish lakes. First food comprised the rotifer *Keratella* sp., Volvox sp., copepod nauplii and stage I copepodites of *Cyclops strenuus abyssorum* Sars. The range of food items taken by larvae increased with length, and the size of food particles ingested was governed by jaw gape which was linearly related to fish length. Food conversion efficiency was 37-72% (arithmetic model) and 21-45% (exponential model).

93. **VASQUEZ, E. & M.-L. MEDINA, 1991.** Predation by dwarf forms of *Asplanchna sieboldi* (Rotatoria) from a floodplain lake of the Orinoco River, Venezuela. *Ann. Limnol.* **27**, 111-118. <Fundacion La Salle Cienc. Nat., Estac. Hidrobiol. Guayana, Apdo. 51, San Felix, Estado Bolivat, Venezuela>. Stomach contents of dwarf *Asplanchna sieboldi* contained small Brachionids (*B. caudatus* and *Keratella americana*). Under the conditions of the study, *Asplanchna* may be considered a stenophagous predator. The predation pattern exhibited by the dwarf *A. sieboldi* was similar to the pattern exhibited by larger species of *Asplanchna* in temperate regions. In both regions, size and abundance of prey seem to control the food preferences of this planktonic predator.

94. **VELA L. 1991.** Natural diet of fish from Lake Xolotlan, Managua. *Hydrobiol. Bull.* **25**, 169-172. <Centro Invest. Recursos Acuaticos Nicaragua, Aptdo 4598, Managua, Nicaragua.> Food habits of *Melaniris sardina*, *Astyanax fasciatus* and *Dorosoma chavesi* (n = 562) were analyzed in Lake Xolotlan (Managua) [Nicaragua]. Quality and quantity of ingested food were studied by dissecting the alimentary canal and observing its content. Cladocera were the main food for *M. sardina* and *A. fasciatus*. *Melaniris sardina* could play an important role in maintaining low cladoceran population densities in the lake. Rotifers are the main food for *D. chavesi*.

95. **VILLEGAS, C.T., O. MILLAMENA & F. ESCRITOR, 1990.** Food value of *Brachionus plicatilis* fed three selected algal species as live food for Milkfish (*Chanos chanos* Forsskal) fry production. *Aquacult. Fish. Manag.* **21**, 213-220. <Address above.> The differences in population growth of *B. plicatilis* and consequently growth of milkfish fry was almost certainly attributed to the differences observed in the biological values of their algal diet, and in particular their protein and lipid contents. The results of the present study point to *Tetraselmis tetrahele* as the most suitable food for the mass culture of the rotifer, *B. plicatilis*.

96. **WALSH, E.J. & Z. LEI, 1992.** Polyploidy and body size variation in a natural population of the rotifer *Euchlanis dilatata*. *J. Evol. Biol.* **5**, 345-353. <Univ. Nevada, Dept Biol. Sci., Las Vegas NV 89154, USA.> Note.

97. **WATSON, G. 1991.** Micro-manipulative preparation of rotifer trophi for SEM. Australian Society for Limnology Conference, 12-15 July 1991, Lorne VIC, Programme and Abstracts. Australian Society for Limnology, s.l., 1991, 1p. Abstract. <MDFRC, Box 921, Albury, NSW 2640, Australia> A simple technique of trophi preparation for SEM is described. Preparation time is quicker than existing techniques, problems associated with sodium hypochlorite are eliminated and specimens can be mounted singly or in groups, enabling preparations of less abundant species

98. **WEISSE, T., H. MUELLER, R.M. PINTO-COELHO, A. SCHWEIZER, D. SPRINGMANN & G. BALDRIN, 1990.** Response of the microbial loop to the phytoplankton spring bloom in a large prealpine lake. *Limnol. Oceanogr.* **35**, 781-794. <Limnol. Inst., Univ. Konstanz, P.O.B. 5560, D-7750 Konstanz, Germany.> More than 50% of primary production was channeled through the microbial loop. Bacteria and ciliates responded rapidly to increasing phytoplankton biomass and production. Averaged over the spring bloom, bacterial C amounted to 21% of phytoplankton C, bacterial production to 18% of particulate primary production. Increase of heterotrophic flagellate populations was prevented by grazing within the microbial loop, probably mainly by the feeding impact of ciliates. Ciliates consumed ca. 14% of primary production. Metazoan microzooplankton (copepod nauplii and rotifers) removed ca. 7% of phytoplankton production. Herbivorous metazooplankton ingested slightly less. Therefore, the phytoplankton bloom was not terminated by excess grazing, but probably by PO_4^{3-} depletion and subsequent sedimentation.

99. **WHYTE, J.N.C. & W.D. NAGATA, 1990.** Carbohydrate and fatty acid composition of the rotifer *Brachionus plicatilis* fed monospecific diets of yeast or phytoplankton. *Aquaculture* **89**, 263-272. <Dept Fisheries Oceans, Biol. Sci. Branch, Pacific Biological Station, Nanaimo, B.C. V9R 5K6, Canada.> Rotifers fed yeast, *Saccharomyces cerevisiae*, and four phytoplanktons, *Thalassiosira pseudonana*, *Isochrysis* aff. *galbana* (T-iso clone), *Tetraselmis suecica*, and *Chlorella saccharophila*, contained carbohydrate composed of 61-80% glucose, 9-18% ribose and 0.8-7.0% of galactose, mannose, deoxyglucose, fucose and xylose, with relative proportions of each being influenced by diet. Glucose was present as glycogen which was characterized, for the first time in a rotifer. Detailed fatty acid profiles of rotifers and diets illustrated the transfer and storage of specific fatty acids from the diets to the rotifers. The diatom *T. pseudonana* was the only diet to produce rotifers with the required complement of n3 polyunsaturated fatty acids suitable for larval fish rearing.

100. **WICKHAM, S.A. & J.J. GILBERT, 1991.** Relative vulnerabilities of natural rotifer and ciliate communities to cladocerans: laboratory and field experiments. *Freshw. Biol.* **26**, 77-86. <Dep. Biol. Sci., Dartmouth College, Hanover, NH 03755, USA.> *Bosmina longirostris* did not depress rotifer or ciliate growth rates; *Daphnia galeata mendotae* had no effect on rotifers, but reduced ciliate growth rates in an enclosure experiment, with only a marginal effect in a jar experiment. In both experiments the largest cladoceran, *Daphnia pulex*, depressed the growth rates of ciliates and those rotifers known to be vulnerable to interference competition. *Polyarthra vulgaris*, previously shown to be resistant to cladoceran interference, was the only rotifer unaffected by *D. pulex* in the field experiment but was depressed by the much higher densities of this cladoceran in the laboratory experiment. Cladocerans did not affect phytoplankton or bacterioplankton abundance in either experiment. The mechanism most likely to be responsible for the suppressive effect of cladocerans on rotifers and ciliates in these experiments is direct mechanical interference or predation, rather than exploitative competition.

101. **WILLIAMSON, C.E. & M.E. STOECKEL, 1990.** Estimating predation risk in zooplankton communities: the importance of vertical overlap. *Hydrobiologia* **198**, 125-132. <Dept Biol. 31, Lehigh Univ., Bethlehem PA. 18015, USA.> Symposium on Intrazooplankton predation, Sao Carlos, Sao Paulo, Brazil, May 29-June 3, 1989..

102. **WURTSBAUGH, W.A. & T.S. BERRY, 1990.** Cascading effects of decreased salinity on the plankton, chemistry and physics of the Great Salt Lake, Utah, U.S.A. *Can. J. Fish. Aquat. Sci* **47**, 100-109. <Dept Fish. & Wildlife, Ecol. Cent., Utah State Univ., Logan, Utah 84322-5210, USA.> Decreased salinity (1985-87 study) has been accompanied by a change in macrozooplankton from one species (*Artemia franciscana*), to an assemblage with one rotifer, two copepods, *Artemia*, and the corixid *Trichocorixa verticalis*. Reduced grazing pressure on the algal community means that high chlorophyll levels (5-44 mg m^{-3}) and low Secchi depths (0.8-2.7 m) are now present throughout the year. The data support the hypothesis that the effects of corixid predation hve cascaded through the Great Salt Lake, affecting herbivores, nutrients and thermal stratification.

103. **WURTSBAUGH, W.A. & C.P. HAWKINS, 1990.** Food resources and diet partitioning of a fish assemblage in Bear Lake, Utah-Idaho, U.S.A. *Bull. Ecol. Soc. Am.* **71** (2 SUPPL.), 375. <Utah State Univ, Logan. Utah 84322, USA.> 75th Ann. Meeting of the Ecol. Soc. America on Perspectives in ECology: Past, Present and Future. Snowbird, Utah, USA, July 29-Aug. 2, 1990.

Dr Walter Koste, "How big do bdelloids get in Malaysia?" At Kuala Lumpur on his way home from Australia in 1990.