ROTIFER NEWS

A newsletter for rotiferologists throughout the world

Issue 27: June 1996

In this issue:

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 a means of informal communication between widely dispersed workers with a common interest, where news, abstracts, work in progress, requests, recent publications and so on can be advertised or circulated.

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

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

* * * * * *

Rotifer News contact addresses:

Production Editor: Russ Shiel, MDFRC, PO Box 921, Albury, NSW 2640 Australia. Ph: 61-60-431002; Fax 61-60-431626; e-mail: shielr@mdfrc.canberra.edu.au

Regional Editors:
Australasia: as above;

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

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

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

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

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

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

Rotifer News Issue 27: Jun-Jul. 1996

Table of Contents *Page*

The cover: some of our favourite animals, courtesy of T. Ramakrishna Rao

Editorial

For those of you who thought *Rotifer News* had fallen off the face of the earth...no...simply a long pause between issues. I have e-mailed a note to all of those for whom I have addresses....The first announcement flyer for Rotifer VIII, Minnesota, is enclosed with this issue, and is self-explanatory. In view of the approaching deadline for return of expressions of interest to Liz Wurdak - August 15 - there is some urgency for intending participants to complete the return part of the form if you have not already responded to the electronic version. Profound editorial apologies for any inconvenience caused by the short notice, but sometimes production and/or mailing delays are beyond my control. It may be necessary for me to provide a few good Minnesota beers in June '97 to compensate anyone for the need for speed.....(!)

Not a lot of 'news' in this issue....very little from the readership and virtual silence from the regional editors.....are we all so engrossed in the demands of modern research that we don't have time to let the global community know what we are doing? Or are we all in contact on the Internet now anyway, and the newsletter is more or less superfluous? We can discuss the future of *Rotifer News* at the Minnesota meeting. Any comments or inputs, get them to me before the December issue (which will be out on time!!).

Thanks to Larry Gonick, the artist, Matt Meselson, the victim, and *Discover* magazine, the venue, for this issue's centrefold!

THE WIZARD OF ID **by Brant Parker and Johnny Hart** *Russ Shiel*

Vale: Prof. Wladyslaw J.H. Kunicki-Goldfinger

I have to inform all our colleagues, most of them being his friends, that Prof. Władysław J.H. Kunicki-Goldfinger died on 14 August 1995 at the age of 79. Prof. Kunicki was a famous microbiologist. After II World War he organized Departments of Microbiology at three (!) universities: in Lublin, Wroclaw and Warsaw and then he created and managed the Institute of Microbiology at Warsaw University. He was an author of many publications, books and handbooks connected with microbiology, biology and philosophy. He was also a great patriot, cooperating with the oppositional organizations. Prof. Kunicki-Goldfinger was a great man, teacher and philosopher. He liked rotifers and loved our "rotifer family". Some of us had the last occasion to see him in Mikolajki when he was attending the VII Rotifer Symposium as a Special Guest.

Jolanta Ejsmont-Karabin

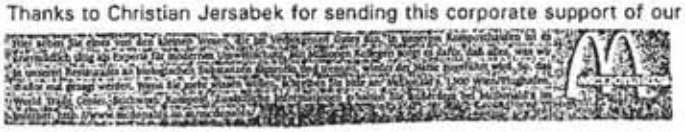
ZMARŁ PROFESOR KUNICKI-GOLDFINGER

Rotifer VIII - Minnesota 1997

Full details in the enclosed First Announcement. Please note that return of the flyer's interest section is SOON....the Second Announcement will be sent only to respondees to the First, so please get your expressions of interest in to Liz a.s.a.p.

Employee of the month

Thanks to Christian Jersabek for sending this corporate support of our logo!



"Here you can see one of the little creatures doing good out of the public eye. For environmental reasons it tirelessly works in our compost heap, and together with millions of co-workers takes care of supplying nature with organic rubbish from our restaurants. So, it had to be said." Translated from *Profil* 30, December 1995 (Austrian Magazine).

Though definitely assigned to the wrong habitat it seems beyond doubt that the little creature misused by McDonald's is a *S_ _ _ _ _*, isn't it, Eric*? This seems to be the first record of a rotifer beating the drum for an economic magnate, like this American financial wizard. What a career! American? Minnesota '97 Rotifer VIII - shouldn't we interpret this a astrong hint? Try to touch them for a cash injection Liz, or at least to organize the barbecue.

***shall we continue with Jolanta's Cup?**

e-mail addresses

The following e-mail addresses are the listing held at MDFRC for the global rotifer group If you are now connected to the Internet, and have not been listed in the newsletter (if you want to be!), or if your address has changed.advise *Rotifer News* at <shielr@mdfrc.canberra.edu.au> or <ltan@albury.net.au>:

Bateman, Lois <lbateman@Beothuk.swgc.mun.ca>
Carmona, Maria <Maria.J.Carmona@uv.es>
Chengalath, Rama <rchengalat@mus-nature.ca>
Duggan, Ian <DUGGAN@waikato.ac.nz>
Dumont, Henri <Henri.Dumont@rug.ac.be>
Egloff, David <fegloff@ocvaxa.cc.oberlin.edu>
Fabbro, Larelle <l.fabbro@cqu.edu.au>
Francez, Andre-Jean <Andre-Jean.Francez@univ.rennes1.fr>
Fussmann, Gregor <fussmann@mpil-ploen.mpg.d400.de>
Green, John <JDG@waikato.ac.nz>
Gulati, Ramesh <gulati@cl.nioo.nl>
Hagiwara, Atsushi <hagiwara@net.nagasaki-u.ac.jp>
Halse, Stuart <stuarth@wood.calm.wa.gov.au>
Ingram, Brett <bai@dce.vic.gov.au>
King, Charles <kingc@bcc.orst.edu>
Kleinow, Walter <Walter.Kleinow@uni-koeln.DE>
Kobayashi, Yoshi <kobayashi.tsuyoshi@epa.nsw.gov.au>
Laybourn-Parry, Jo <J.Laybourn-Parry@nottingham.ac.uk>
May, Linda <L.May@ife.ac.uk>
McIsaac, Hugh <HUGHM@UWINDSOR.CA>
Melone, Guilio <g.melone@imiucca.csi.unimi.it>Örstan, Aydin <AO9@FDACF.SSW.DHHS.GOV>
Riccia, Claudia <rotiferi@imiucca.csi.unimi.it>
Rico-Martinez, Roberto <gt1331b@prism.gatech.edu>
Sanoamuang, La-orsri <la_orsri@kku1.kku.ac.th>
Saunders-Davies, Tony <tonysd@cix.compulink.co.uk>
Segers, Hendrik <SEGERS@say.acnatsci.org>
Serra, Manuel <Manuel.Serra@uv.es>
Shiel, Russ <shielr@mdfrc.canberra.edu.au>
Snell, Terry <ts41@acme.gatech.edu>
Starkweather, Peter <strkwthr@nevada.edu>
Stemberger, Rich <Richard.S.Stemberger@Dartmouth.EDU>
Tan, Lor-Wai <LTAN@AWCNET.AW.LATROBE.EDU.AU>
Telesh, Irena <tiv@zisp.spb.su>
Turner, Paul <72073.772@CompuServe.COM>
Wallace, Bob <Wallacer@mac.ripon.edu>
Walsh, Liz <ewalsh@mail.utep.edu>
Welch, David <welch@husc8.harvard.edu>
Wurdak, Liz <EWURDAK@tiny.computing.csbsju.edu>

Newsn'Views

1. Matt Ridley's tongue-in-cheek article in the last issue of *Rotifer News* prompted this comment from Aydin Örstan:

"I suggest a correction regarding Matt Ridley's bdelloid article. "Tuns" are dried tardigrades, nobody - except Matt Ridley - calls dried bdelloids tuns."

[There you go Ros.....we do learn something every day! - *Ed.*]

* * * *

2. Spotted in Oz: Eminent South African hominid paleontologist, diverging to invertebrates and recently to rotifers, Bob Brain, from the Transvaal Museum, has been touring the wet end of Oz for some weeks. Recently

joined by wife Laura, chief grinder of cherts, Bob and Laura fleetingly visited MDFRC en route to warmer climes - but couldn't see our billabongs through the fog. More rotifer folks most welcome to visit...there aren't enough of them!

3. Atsushi Hagiwara is frantically preparing for the September Aquaculture meeting:

Check the details on the WWW: (http://www.fish.nagasaki-u.ac.jp/)

* * * *

NEW BDELLOIDS I

4.

Aydin Örstan, October, 1995

These bdelloid rotifers were either left out of Donner's Ordnung Bdelloidea (1965) or they have been described since then. Please send comments & the citations for the species that I may have missed to me at 13348 Cloverdale Place, Germantown, MD 20874, USA.

1. *Philodina*(?) *jeanneli* de Beauchamp [Mémories du Muséum National d'Histoire Naturelle, Nouvelle Série, 14:313-326, 1940]

This species was brought to my attention by A. Hirschfelder who had heard about it from E. Holloway.

2. *Mniobia burgeri* Bartoš, 1951
[Taxonomic history: *Mniobia animosa* variety Burger, 1948; *Mniobia burgeri* Bartoš, 1951; *Macrotrachela libera* variety Donner, 1965; *Mniobia burgeri* Bartoš (Haigh, 1967); *Mniobia ostensa* Donner, 1980.]

If I am translating Donner correctly, he states that Bartoš named Burger's *"M. animosa* variety *macrocephala"* as *"M. burgeri"* [Donner, Rev. Ecol. Biol. Sol, vol. 17, p140, 1980]. In reality, Bartoš named Burger's *"M. animosa* variety" as *"M. burgeri"* and kept the variety *"macrocephala"* as it was [Bartoš, Vestnik Cs. Zool. Spolec. vol. 15, p466, 1951]. Therefore, Bartoš's *burgeri* should have precedence over Donner's *ostensa*.

3. *Macrotrachela extensa* Haigh [J. Quekett Mic. Club, 30:36, 1965]

4. *Macrotrachela ligulata* Haigh [J. Quekett Mic. Club, 30:36, 1965]

5. *Macrotrachela obtusa* Haigh [J. Quekett Mic. Club, 30:193, 1966]

6. *Mniobia lobata* Haigh [J. Quekett Mic. Club, 30:223, 1967]

7. *Adineta acuticornis* Haigh [J. Quekett Mic. Club, 30:223, 1967]

8. *Embata acutipoda* Wycliffe & Michael [Current Science, 37:106, 1968]

Wycliffe & Michael described this species as *Pseudoembata acutipoda*. But I am placing their species in *Embata*, because their reasons for creating a new genus were frivilous.

9. *Philodina calceata* Donner [Arch. Hydrobiol. Suppl. 36:109, 1970]

10. *Otostephanos kostei* Donner [Arch. Hydrobiol. Suppl. 44:49, 1972]

11. *Anamopus chasmagnathi* Mañé-Garzón & Montero [Revista de Biologia del Uruguay 1:139, 1973]

12. *Habrotrocha vicina* Donner [Rev. Écol. Biol. Sol, 17:125 1980]

13. *Dissotrocha björki* Berzinš [Limnol. Inst., Lund, 1982]

14. *Macrotrachela sonorensis* Örstan [Southwest. Nat., 40:255, 1995]

Updated Bibliography

Ed. note: To maintain a comprehensive list of recent publications - authors should remember to pass on copies, or at least publication details, to one of the regional editors, or directly to Russ Shiel at MDFRC. In the list below, only the address for reprints is included. Every effort has been made to include a summary, however some lists sent by authors did not contain summaries, so these papers remain unseen. Some papers include keywords in lieu of a summary. The major subject areas in each citation are categorized below - many papers include several topics.

Aquaculture: 4, 14, 16, 31, 32, 35, 47, 56, 64, 73, 74, 98 ;

Anatomy/Morphology/Physiology: 6, 24, 33, 46, 51, 59, 66, 68, 71, 94, 96;

Behaviour: 9, 26, 38, 42, 47, 51, 61, 72, 86, 89;

Biochemistry/Genetics/Pharmacology/Reproduction: 8, 22, 26, 27, 33, 45, 48, 72, 86, 96, 97; ;

Biogeography/Taxonomy: 7, 11, 12, 13, 21, 28, 29, 30, 33, 52, 53, 55, 67, 69, 76, 78, 80, 81, 82, 83, 87, 90, 91, 92, 93;

Biomanipulation/Eutrophication/Perturbation/Water quality; 10. 15. 43. 54. 58. 75;

Dictionary/History: 36, 50;

Ecology/Population dynamics/Food webs: 1, 2, 3, 5, 7, 10, 13, 14, 15, 17, 18, 19, 20, 23, 25, 27, 28, 29, 30, 31, 34, 35, 37, 38, 39, 40, 42, 44, 54, 57, 60, 61, 62, 64, 69, 70, 75, 77, 78, 79, 80, 87, 88, 89, 90, 95, 97;

Toxicology: 41, 49, 63, 85;

1: ADAMKIEWICZ-CHOJNACKA, B. & R. HEERKLOSS, 1995. Inter-annual variation of rotifer biomass in two coastal lagoons of the Southern Baltic differing by degree of trophy. *Hydrobiologia* 313, 341-344. <<Dept Sanitary Hydrobiol, PL-10970 Olsztyn, Poland.>> The two water bodies (Darss-Zingst estuary and the Vistula Lagoon) had similar dominance structures of the rotifer community, though in the more eutrophic Darss-Zingst estuary there was always a more pronounced summer peak. There was no simple coincidence between variation patterns of rotifer biomass and such environmental factors as water temperature and salinity.

2: ALI, A.J., S.S.S. SARMA, G. MURUGAN & H.J. DUMONT, 1996. Effect of zooplankton type and abundance on prey consumption by the fairy shrimp, *Streptocephalus proboscideus* (Anostraca: Crustacea). *Hydrobiologia* 319, 191-202. <State Univ Ghent, Lab Anim Ecol, Kl Ledeganckst 35, B-9000 Ghent, Belgium.> *S. proboscideus* females consumed 25-90% more prey than males. Rotifers had the highest numerical percentage in the gut, regardless of predator size or sex. Cladocerans were only consumed by adults I and II. Adult II females consumed 28.5-43.3 µg zooplankton dry weight ind.$^{-1}$ h.$^{-1}$. *S. proboscideus* is a non-selective filter feeder. Since it did not eat jumping rotifers, copepod nauplii and copepodites, it may contribute to structuring its prey communities, because good escapers will be enriched in the medium, while poor escapers will be depleted.

3: ALIREA, S. 1995. Biological observation of Rotifera in Parishan (Fammur) Lake, Kazeroun, Fars, Iran. *J. Environm. Biol.* 16, 325-331. << Islam Azad Univ, Kazeroun Branch, Dept Biol, Fars 73149, Iran.>> This study correlated population density of surface Rotifera with some physico-chemical parameters i.e. air and water temperature, rainfall, dissolved oxygen, BOD, COD, pH, total nitrogen, total hardness, TDS and alkalinity.

4: AOKI, S. & A. HINO 1996. Nitrogen flow in a chemostat culture of the rotifer *Brachionus plicatilis*. *Fisheries Science* 62, 8-14. <Univ Tokyo, Fac Agr, Fisheries Lab, Hamana, Shizuoka 43102, Japan.> *B. plicatilis* egested 70-80% of the ingested nitrogen as particulate organic nitrogen (PON) and about 80% of the remaining assimilated nitrogen was utilized for reproduction. Low net growth efficiency (K-2) at high algal densities proved "superfluous feeding". 20% of PON egested was incorporated in the rotifer again by bacteriovory, and 13% of that was remineralized to NH^{4+} by bacteria. The PON was accumulated as a suspended or attached form in the culture vessel, which might cause an unstable environment.

5: BEVINGTON, D.J., C. WHITE, R.L. WALLACE, 1995. Predatory behavior of *Cupelopagis vorax* (Rotifera; Collothecacea; Atrochidae) on protozoan prey. *Hydrobiologia* 313, 213-217. <<Ripon Coll., Dept Biol., Ripon, WI 54971 USA.>> By rotating on a short, flexible, pedal stalk, *C. vorax* captures prey that traverse the substratum to which this sessile rotifer attaches. Microvideographic analysis (including slow motion and freeze-frame) is used to describe some of the details of *Cupelopagis* foraging behavior. While not unique in its ability to detect water movements, *Cupelopagis* is the only rotifer known to exhibit specific behaviors to vibrations produced by potential prey.

6: BIELANSKA-GRAJNER, I. 1995. Influence of temperature on morphological variation in populations of *Keratella cochlearis* (Gosse) in Rybnik Reservoir. *Hydrobiologia* 313, 139-146. <<Silesian Univ, Dept Ecol, Ul Bankowa 9, PL-40007 Katowice, Poland.>> Four morphological forms were distinguished: *K. cochlearis* f. *cochlearis*, *K. cochlearis* var *tecta* f. *micracantha*, *K. cochlearis* var. *tecta* f. *typica* and *K. cochlearis* f. *macracantha*. A correlation between the length of the lorica and the posterior spine, and the temperature of water was observed. These four forms of *K. cochlearis* occurred during the entire period of investigations.

7: BRAIN, C.K., I. FOURIE & R.J. SHIEL, 1995. Rotifers of the Kalahari Gemsbok National Park, South Africa. *Hydrobiologia* 313, 319-324. <<Transvaal Museum, POB 413, Pretoria 0001, South Africa.>> The water in 39 artificial water sources in the Park varies from fresh to highly saline. The rotifer fauna , studied in summer and winter, is dominated by mixed populations of *Brachionus calyciflorus*, *B. plicatilis* and *Hexarthra jenkinae*, with only a few other monogononts and bdelloids. The most striking feature of the rotifer fauna in these troughs is the very low species diversity encountered.

8: CARMONA, M.J., A. GOMEZ & M. SERRA, 1995. Mictic patterns of the rotifer *Brachionus plicatilis* Müller in small ponds. *Hydrobiologia* 313, 365-371. <<Univ Valencia, Dept Microbiol. & Ecol., E-46100 Burjassot, Spain.>>

From a previous study 'S' and 'L' morphotypes were known to correspond to genetically different clonal groups. The clonal groups showed different patterns of mixis. L clonal group presented a continuous sexual reproductive pattern. In contrast, S clones showed a rather punctuated mictic pattern. A positive correlation between levels of sexual reproduction and population density was found for S and L groups.However, they differed in their density threshold for mictic reproduction. The adaptive meaning of these patterns and their implications in maintaining genetic diversity within and between populations are discussed.

9: CHAROY, C. 1995. Modification of the swimming behaviour *of Brachionus calyciflorus* (Pallas) according to food environment and individual nutritive state. *Hydrobiologia* 313, 197-204. <<Univ. Lyon 1, Ltec, Bat 403, 43 Bd 11 Nov 1918, F-69622 Villeurbanne, France.>> The swimming behaviour of orthoclonal *Brachionus calyciflorus* (Pallas) females was studied with the aid of a system of automated trajectometry. Results showed a modification in the swimming pattern dependent on both food environment and nutritive state of females. The nature of stimulations inducing these behavioural modifications, and their interactions with the individual nutritive state are briefly discussed.

10: CRISPIM, M.C. & M.J. BOAVIDA, 1995. Comparison of rotifer communities in Maranhao Reservoir (Portugal) before its complete emptying and on refilling. *Hydrobiologia* 313, 325-332. <<Univ. Lisbon, Fac. Ciencias, Ctr Biol. Ambiental, Dept Zool. & Antropol., Campo Grande C2, P-1700 Lisbon, Portugal.>> A study of the rotifer community prior to emptying, and after refilling a large reservoir, suggested that the rotifer community was not significantly affected by emptying of the reservoir.

11: DE SMET, W.H. & L. BEYENS, 1995. Rotifers from the Canadian High Arctic (Devon Island, Northwest Territories). *Hydrobiologia* 313, 29-34. <<Univ Antwerp, Dept Biol, Ruca Campus, Groenenborgerlaan 171, B-2020 Antwerp, Belgium.>> Samples from eight water bodies in the region of Truelove and Sparbo Hardy Lowland, Devon Island (75 degrees 30'N, 86 degrees 00'W) yielded 70 taxa (4 Bdelloidea, 66 Monogononta) of rotifers, 19 of which are new records for the Canadian High Arctic.

12: DE SMET, W.H. 1995. Description of *Encentrum diteteri* sp nov (Rotifera,Dicranophoridae) from the high arctic, with redescription of *E. bidentatum* (Lie-Pettersen, 1906) and *E. murrayi* Bryce, 1922. *Belgian Journal of Zoology* 125, 349-361. <<Address above.>>This new rotifer, collected from littoral marine algae of two fjords in Spitsbergen, Svalbard, is described and illustrated. *E. murrayi* Bryce, 1922 is reported for the first time since its description from Spitsbergen; it is redescribed and illustrated. Also described and illustrated is *E. bidentatum* (Lie-Pettersen, 1906); *E. linnhei* Scott, 1974 is synonymised with *E. bidentatum*.

13: DIEGUEZ, M.D. & B.E. MODENUTTI, 1996. *Keratella* distribution in North Patagonian lakes (Argentina). *Hydrobiologia* 321, 1-6. <<Univ Nacl. Comahue, Ctr Reg. Bariloche, CC 1136, RA-8400 San Carlos Barilo, Rio Negro, Argentina.>> The distribution of *Keratella* species from 15 different lakes in North Patagonia (Argentina) was analysed. The genus was not present at

altitudes above 1000 m. *K. tropica* was restricted to Patagonian Plateau lakes with a comparatively high conductivity. A morphometric analysis of the widely distributed *K. cochlearis* was performed. Results showed three groups of *K. cochlearis* corresponding to Andean lakes, Patagonian Plateau lakes and a Patagonian Reservoir.

14: DIERCKENS, K.R., S.S.S. SARMA, J. MERTENS & H.J. DUMONT, 1995. Feeding the fairy shrimp *Streptocephalus* (Anostraca - Crustacea) with the rotifer *Anuraeopsis*. *Hydrobiologia* 308, 29-33. << State Univ. Ghent, Anim. Ecol. Lab, KL Ledeganckstr. 35, B-9000 Ghent, Belgium.>> Functional response for large *S. torvicornis* (both sexes) plateaued at 400 rotifers ml^{-1}, while in small specimens it did so at 200 prey ml^{-1}. Females consumed significantly more (30%) prey than males. Large males consumed maximum 4730 rotifers h^{-1}, females 6560 h^{-1}.

15: EJSMONT-KARABIN, J. 1995. Rotifer occurrence in relation to age, depth and trophic state of quarry lakes. *Hydrobiologia* 313, 21-28<<PAS, Hydrobiol Stn, Inst Ecol, Ul Lesna 13, PL-11730 Mikolajki, Poland.>> Rotifers were even found in the youngest (2 y.o.) lake, but both rotifer density and species richness were low there. Rotifer communities of much higher density and species diversity were noted in lakes only 4-6 years older. Lakes of over 30 years of age were strongly differentiated in rotifer numbers and species structure.

16: ESTEVEZ, A. & A. KANAZAWA, 1996. Fatty acid composition of neural tissues of normally pigmented and unpigmented juveniles of Japanese flounder using rotifer and *Artemia* enriched in n-3 HUFA. *Fisheries Science* 62, 88-93.< Not seen.

17: FELIX, A., M.E. STEVENS & R.L. WALLACE, 1995. Unpalatability of a colonial rotifer, *Sinantherina socialis*, to small zooplanktivorous fishes. *Invert. Biol.* 114, 139-144. <<Dept Biol. Ripon College, Ripon, WI 54971-0248, USA.>> Describes offering rotifer colonies as prey to 14 species of small-mouthed predatory fishes, which rejected 71-100% of colonies, most of which remained undamaged after mouthing by fish. In contrast 0-14% of cladocerans offered were rejected. This is the first evidence for unpalatability of rotifers to zooplanktivorous fishes.

18: FRADKIN, S.C. 1995. Effects of interference and exploitative competition from large-bodied cladocerans on rotifer community structure. *Hydrobiologia* 313, 387-393. <<Dartmouth Coll, Dept Biol Sci, Hanover, NH 03755 USA.>> An in situ, 5-day, bag-enclosure experiment was conducted to test the hypothesis that populations of the rotifers *Anuraeopsis* spp., *Keratella cochlearis* 'typica' and *Polyarthra* spp. are differentially suppressed by interference competition. Rotifer density decreases and observed vs. expected mortality rates for all three rotifer taxa were consistent with the hypothesis of suppression via interference competition. Evidence of exploitative effects were also apparent, though interference effects appeared more important at higher cladoceran densities.

19: GALKOVSKAYA, G.A. 1993. Population growth rate of rotifers in gradient of food concentrations. *Vesti ANB. ser. biyal. navuk.* 2, 95-99. (In

Belarussian). <<Byelarussian Acad Sci, Inst Zool, Scorina St 27, Minsk 220072, Byelarus.>> Not seen, title only from author.

20: GALKOVSKAYA, G.A. & I.F. MITYANINA, 1993. Peculiarities of interpopulation relations of rotifer *Brachionus calyciflorus* Pallas and *Euchlanis dilatata lucksiana* Hauer. *Doklady ANB* 37, 61-65. (In Russian) <<Address above.>> Not seen, title only from author.

21: GALKOVSKAYA, G.A., V.V. VEZHNOVETZ & V.E. ROSCHCHIN, 1993. Taxonomical structure of zooplankton of Belarussian laes. *Vesti AND, ser. biyal. navuk.* Dep. v. VINITI, N. 707-B93, 25 pp. (In Russian). <<Address above.>> Not seen, title only from author.

22: GALKOVSKAYA, G.A. 1995. Oxygen consumption rate in rotifers. *Hydrobiologia* 313, 147-156. <<Address above.>> The generalized relationship of oxygen consumption rate (R, nl O_2 ind^{-1} h^{-1}) and dry body mass (M, μg) for rotifers is described by the equation: $R = 9.15M^{(0.716)}$. The level of rotifer metabolism is slightly lower than that of multicellular poikilothermic animals. OCR depends on food concentration. An increase of food concentration from 1.4 to 7.0 pg dry mass ml^{-1} resulted in *Brachionus calyciflorus* in an OCR escalation of 2.5 times at 30 °C, and 0.5 times at 25 °C. Maximal OCR values occur at food concentration close to the saturation concentration for population growth rate.

23: GAUGHAN, D.J. & I.C. POTTER, 1995. Composition, distribution and seasonal abundance of zooplankton in a shallow, seasonally closed estuary in temperate Australia. *Estuarine Coastal and Shelf Science* 41, 117-135. <<Murdoch Univ., Sch. Biol. & Environm. Sci., Murdoch, W.A. 6150, Australia.>> The rotifer *Synchaeta* cf. *baltica* was among the copepod dominated zooplankton of a Western Australian estuary. The densities of the 10 most abundant taxa did not exhibit sharply defined seasonal peaks, except for *S.* cf. *baltica*, which peaked in summer. Since even copepod nauplii, the main prey of fish larvae, were typically at least 20 000 times more abundant than fish larvae, it is unlikely that the zooplankton food supply of fish larvae in Wilson Inlet was limiting.

24: GILBERT, J.J. & D.K. SCHREIBER, 1995. Induction of diapausing amictic eggs in *Synchaeta pectinata*. *Hydrobiologia* 313, 345-350. <<Dartmouth Coll., Dept Biol. Sci., Hanover, NH 03755 USA.>> Amictic females of a clone of *S. pectinata* from Star Lake (Norwich, Vermont) may produce diapausing as well as non-diapausing (subitaneous) eggs. Consistent with the effect of low food availability, a period of starvation was very effective in inducing the development of diapausing eggs. Diapausing eggs produced and left at 19 °C hatched after 4 to 13 days. Those produced in cultures with a low food level took significantly longer to hatch (9.7 days) than those produced in cultures with a high food level (8.1 days) ($p = 0.022$). In natural communities, *S. pectinata* should be able to respond directly and rapidly to poor food conditions by producing eggs that undergo an obligatory dormant period before resuming development.

25: GIRDNER, S.F. & G.L. LARSON, 1995. Effects of hydrology on zooplankton communities in high-mountain ponds, Mount Rainier National

Park, U.S.A.>> *J. Plankt. Res.* 17, 1731-1755. <<Crater Lake Natl Pk, Crater Lake, OR 97604 USA.>>Describes plankton population dynamics in 10 high altitude ponds. Rotifer densities typically were lower in temporary ponds relative to those in permanent ponds, although *Brachionus urceolaris* was abundant shortly before the temporary ponds dried. Large volume loss was associated with large declines in total abundances of crustacean populations. Owing to their small sizes and sensitivity to environmental change, collectively ponds such as these may provide an early signal of long-term climate change in aquatic systems.

26: GOMEZ, A. & M. SERRA, 1995. Behavioral reproductive isolation among sympatric strains of *Brachionus plicatilis* Müller 1786: Insights into the status of this taxonomic species. *Hydrobiologia* 313, 111-119. <<Univ. Valencia, Dept Microbiol. & Ecol., E-46100 Burjassot, Spain.>> Cross-mating experiments using three *B. plicatilis* strains demonstrated no gene flow among them. Males of a strain tend to mate with females of the same strain or genetically similar strains. There was a high positive correlation between isolation distance and genetic distance. These results suggest that mating behavior acts as an important isolating barrier, giving cohesion to clonal groups, and structuring populations of *B. plicatilis*. This taxon comprises more than one biological species.

27: GOMEZ, A., M. TEMPRANO & M. SERRA, 1995. Ecological genetics of a cyclical parthenogen in temporary habitats. *J. Evol. Biol.* 8, 601-622. <<Address above.>> An electrophoretic survey of *B. plicatilis* from three ponds revealed a high level of overall genetic polymorphism in four marker loci, but only 13 multilocus genotypes were found. We classified clones into three clonal groups (SS, SM, L) characterized by unique arrays of alleles in the four marker loci, and significant differences in body shape and size. Factor analysis on the limnological parameters indicates that genetically different clonal groups are also ecologically specialized, suggest that *B. plicatilis* is in fact a species complex. The complete genetic discontinuity model of rotifer population succession is supported by these data.

28: GREEN, J. 1995. Associations of planktonic and periphytic rotifers in a Malaysian estuary and two nearby ponds. *Hydrobiologia* 313, 47-56. <<17 King Edwards Grove, Teddington TW11 9LY, Middx, England.>> Compared the rotifer fauna along a salinity gadient in an estuary, and with the assemblage found in two local ponds. Of the 63 species found in the estuary only 29 were also found in the ponds. Compared to the total known rotifer fauna of Malaysia the estuary has a higher proportion of *Lecane* species (40%), with *Brachionus* and *Trichocerca* are under-represented. Species associated with inland saline waters, such as *Brachionus plicatilis, B. dimidiatus* and *Hexarthra jenkinae* were not found in the estuary.

29: GREEN, J.D. & R.J. SHIEL, 1995. Calanoid copepods as rotifer taxonomists. *Quek. J. Microscopy* 37, 491-492. Describes the analysis of calanoid gut contents for rotifer remains. Up to 40 rotifers were found in the guts of individuals of the centropagid *Boeckella major*. Most could be identified to species. Predator gut contents provides both a measure of selectivity, and in this case, rotifer species diversity - some prey taxa were not recorded from concurrent net samples.

30: HABERMAN, J. 1995. Dominant rotifers of Vortsjarv (Estonia). *Hydrobiologia* 313, 313-317. <<Vortsjarv Limnol Stn, Rannu 2454, Estonia.>> Rotifers form 71% of the zooplankton of the strongly eutrophic (total N 2 g m^3, total P 53 mg m^3) Vortsjarv (Estonia). Altogether 150 taxa of rotifers occur. Species characteristic of oligo- and mesotrophic waters have totally disappeared during the last 30 years, or are disappearing now. Species whose numbers and biomass reached 20% or more of total zooplankton were considered dominants.

31: HAGIWARA, A., M.-M. JUNG, T. SATO & K. HIRAYAMA, 1995. Interspecific relations between marine rotifer *Brachionus rotundiformis* and zooplankton species contaminating in the rotifer mass culture tank. *Fisheries Science* 61, 623-627. <<Nagasaki Univ, Fac Fisheries, Bunkyo Ku, Nagasaki 852, Japan.>> The population growth *of B. rotundiformis, B. plicatilis*, and *Diaphanosoma celebensis* in mixed-species cultures were significantly suppressed when compared with those in single-species cultures. *Tigriopus japonicus* grew better when cultured with *B. rotundiformis*. *B. rotundiformis* did not affect the growth of *Euplotes* sp, but *Euplotes* sp. population interferes with the growth of *B. rotundiformis*. Bacterial intervention in the interspecific relation of *T. japonicus* and *Euplotes* sp, with B. *rotundiformis* is suggested.

32: HAGIWARA, A., N. HOSHI, F. KAWAHARA, K. TOMINAGA & K. HIRAYAMA, 1995. Resting eggs of the marine rotifer *Brachionus plicatilis* Müller: Development, and effect of irradiation on hatching. *Hydrobiologia* 313, 223-229. <<Address above.>> Resting eggs that have completed maturation and are in the external diapause period require light for hatching. The threshold of light (halogen lamp) intensity for hatching was estimated to be 4400 lux for 30 min. Irradiation at more than 350 nm caused 1-25% hatching, but it reached 50-60% at 250-310 nm light. The addition of hydrogen peroxide or prostaglandins (E(1), E(2) or F-2 alpha) caused resting egg hatching even in darkness. The production of peroxide in seawater caused by light, and the oxidation of fatty acid to prostaglandins inside the embryo, are possible mechanisms of resting egg hatching.

33: HAGIWARA, A., T. KOTANI, T.W. SNELL, M. ASSAVAAREE & K. HIRAYAMA, 1995. Morphology, reproduction, genetics, and mating behavior of small, tropical marine *Brachionus* strains (Rotifera). *J. Exp. Mar. Biol. Ecol.* 194, 25-37. <<Address above.>> Based on morphological features, reproductive mode, and allozyme patterns, SS strains were most similar to those of *B. rotundiformis* Tschugunoff. Observations on mating behavior between different groups indicated that there is reproductive isolation between *B. plicatilis* Müller and *B. rotundiformis* and between *B. plicatilis* and SS strains. In contrast, copulation was observed between *B. rotundiformis* and SS strains. Thus, there is no evidence that SS strains are a new marine *Brachionus* species, and most likely should be included in *B. rotundiformis*.

34: HAGA, H., T. NAGATA & M. SAKAMOTO, 1995. Size-fractionated NH_4^+ regeneration in the pelagic environments of two mesotrophic lakes. *Limnol. Oceanogr.* 40, 1091-1099.<< Shiga Prefecture Board Educ, Lake Biwa Museum Project, Uchidehama 14-15, Otsu, Shiga 520, Japan.>>. In

mesotrophic Lakes Kizaki and Biwa, Japan, nanoflagellates and microzooplankton (mainly rotifers) accounted for a large fraction (17-55 and 0-67%, respectively) of total NH_4^+ regeneration, suggesting that microbial food webs were primarily important. Bacterial contributions to NH_4^+ regeneration were high (26-51%) in summer but low (<10%) in spring and winter, which was explained in part by the strong dependency of bacterial sR on temperature. Our data demonstrate that rates and major pathways of NH_4^+ regeneration may vary greatly depending on the size structure of planktonic food webs.

35: HEERKLOSS, R. & S. HLAWA, 1995. Feeding biology of two brachionid rotifers: *Brachionus quadridentatus* and *Brachionus plicatilis*. *Hydrobiologia* 313, 219-221. <<Univ Rostock, Fachbereich Biol, Freiligrathstr 7-8, D-18051 Rostock, Germany.>> Growth experiments showed that the Chlorophyceans *Nannochloris* sp. and *Chlorella vulgaris* possess good nutritional value for these rotifers. However, *B. quadridentatus* declined in cultures with *Microcystis firma*, detritus of *Enteromorpha* sp. or *Pseudomonas* sp. (bacteria) as a sole source of food. Utilization of latex microspheres by these two species indicate that they respond to particle size in different ways: *B. quadridentatus* had a higher selectivity index for 3 and 5 µm beads, while *B. plicatilis* had a higher selectivity index for 2 µm beads.

36: HILLBRICHT-ILKOWSKA, A. 1995. One hundred years of Polish rotiferology - Scientists and their work. *Hydrobiologia* 313, 1-14. << Polish Acad Sci, Inst Ecol, PL-05092 Lomianki, Poland.>> Polish scientific publications concerning rotifers are recorded and discussed. The papers of Wierzejski (published mainly in 1893) mark a century of advanced rotifer studies in Poland. The work of Wiszniewski on psammon (published in 1933-1938) and on parasitic rotifers (1939, 1948, 1953) is presented in detail, as well as the papers of Pawlowski (published in 1934-1980). A number of contemporary Polish rotifer publications and their distribution by habitat studied, as well as selected results, are discussed.

37: HORN, W. & H. HORN, 1995. Limnological features of different acidic drinking water reservoirs in the Erzgebirge (Germany). Internationale *Rev. Ges. Hydrobiol.* 80, 623-638. << Sachs. Akad. Wissensch. Leipzig, Arbeitsgruppe Limnol. Talsperren, Neunzehnhainer Str 14, D-09514 Wunschendorf, Germany.>> A consequence of acidification is an overall decrease in the number of species (despite the fact that also some species newly appear in the acidified waters). Furthermore, a loss of food web complexity is observed and the trophic structure changes, e.g. fish have disappeared and invertebrate predators have become more numerous. In the acidic reservoir, species well adapted to waters low in pH and hardness (e.g. *Synura sphagnicola*) are more abundant and commonly benthic animals (e.g. *Chydorus sphaericus*) are able to extend their habitat to the open waters.

38: IYER, N. & T.R. RAO, 1995. Epizoic mode of life in *Brachionus rubens* Ehrenberg as a deterrent against predation by *Asplanchna intermedia* Hudson. *Hydrobiologia* 313, 377-380. <<Univ. Delhi, Dept Zool, Delhi 110007, India.>> Describes population growth patterns of *B. rubens* alone and in the presence of the host species *Daphnia carinata* and *Ceriodaphnia rigaudi*. In the absence of cladocerans, the prey was eliminated within three

days, followed by extinction of the predator due to starvation. With *D. carinata* in the medium, the prey-predator system persisted much longer, with *B. rubens* reaching high densities. With the smaller-sized *C. rigaudi*, allowing a significantly smaller fraction of *B. rubens* population to be epizoic, the system persisted longer than in the controls, but both the prey and predator eventually became extinct. We conclude that the epizoic habit of *B. rubens*, by acting as a 'prey refugium', helps a portion of the population to escape from predation, and facilitates its coexistence with *A. intermedia*.

39: JENKINS, D.G. 1995. Dispersal-limited zooplankton distribution and community composition in new ponds. *Hydrobiologia* 313, 15-20. <<Sangamon State Univ., Biol Program, Springfield, IL 62794 USA.>> Twelve new experimental ponds were constructed identically, filled simultaneously, had similar physical and chemical properties, and were maintained with minimal manipulation. Colonizing zooplankton communities were sampled bi-weekly for one year. Rotifers dominated zooplankton communities in densities, biomass, and species number (47 of 61 observed species were rotifers). Only 14 species were observed in all 12 ponds; 9 were rotifers. Twenty-nine species (26 rotifers) were recorded in less than or equal to 6 ponds. Species with high vagility exhibited greater viability. Ponds differed in zooplankton community composition throughout the year, due to differences in both vagility and viability among colonizing species.

40: JERSABEK, C.D. 1995. Distribution and ecology of rotifer communities in high-altitude alpine sites - A multivariate approach. *Hydrobiologia* 313, 75-89.<< Salzburg Univ., Inst. Zool., Hellbrunnesrstr. 34, A-5020 Salzburg, Austria.>> 162 substrate classified samples were taken at 60 sampling sites situated between 1824 m and 2753 m a.s.l. in the Central Austrian Alps (predominantly gneiss) and between 1290 m and 1643 m a.s.l. in the Northeastern Calcareous Alps. Different groups of taxa were identified on the basis of their total frequencies of occurrence and frequency of co-occurrence. Habitat complexity, as indicated by taxon diversity and density of submersed vegetation, pH, conductivity, and temperature seem to be the principal components affecting community composition and distribution of single species in alpine waterbodies; Highest diversities were measured in limestone solution lakes and acid bog ponds on primary bedrock.

41: JOAQUIM-JUSTO, C., V. GOSSELAIN, J.P. DESCY & J.P. THOME, 1995. Relative importance of the trophic and direct pathways on PCB contamination in the rotifer species *Brachionus calyciflorus* (Pallas). *Hydrobiologia* 313, 249-257. <<Univ Liege, Inst. Zool., Quai Van Beneden 22, B-4020 Liege, Belgium.>> To determine the contribution of food ingestion (trophic pathway) to PCB contamination of zooplankton in the river Meuse (Belgium), we used ^{14}C-labelled algae (*Dictyosphaerium ehrenbergianum*) to measure ingestion and assimilation rates in the rotifer species *Brachionus calyciflorus*. The estimated PCB contamination of zooplankton ascribable to the trophic pathway ranges from 0.22 +/- 0.17 to 1.31 +/- 0.77 µg PCBs g^{-1} D.W. at 15 °C and from 0.64 +/- 0.34 to 5.10 +/- 2.10 µg PCBs g^{-1} D.W. at 20 °C. In a 48-hour in vitro experiment in which the rotifers were fed contaminated algae, the PCB accumulation measured in the rotifers was found to coincide with the calculated PCB contamination.

SCIENCE CLASSICS

BY LARRY GONICK

42: JOSE DE PAGGI, S. 1995. Vertical distribution and diel migration of rotifers in a Parana River floodplain lake. *Hydrobiologia* 310, 87-94. << Inst. Nacl. Limnol, Macia 1933, Santa Fe, Argentina.>> The vertical distribution of zooplankton rotifers in the open waters of Laguna El Tigre was investigated. Rotifers showed a relatively uniform distribution throughout the water column. This pattern of distribution was maintained during the year and did not show variations in relation to hydrologic phases of inundation and isolation of the lake. Diel vertical migration of rotifers from the limnetic and the littoral area was investigated too. In littoral area rotifers exhibited a reverse migration, whereas in the limnetic the movements were less conspicuous. Horizontal migration was observed too, and there were interactions between horizontal and vertical distribution. Predation and competition offer a possible explanation.

43: KAUSHIK, S. & D.N. SAKSENA, 1995. Trophic status and rotifer fauna of certain water bodies in General India. *J. Environm. Biol.* 16, 283-291. <<Jiwaji Univ., Sch. Studies Zool., Gwalior 474011, India.>> The trophic status and rotifer fauna of three water bodies were studied. Motijheel was mesotrophic while Surajkund and Ranital were eutrophic. Fifty three species of rotifers were identified, and indicators of trophic status discussed.

44: KIZITO, Y.S. & A. NAUWERCK, 1995. Temporal and vertical distribution of planktonic rotifers in a meromictic crater lake, Lake Nyahirya (Western Uganda). *Hydrobiologia* 313, 303-312. <<Akad Wissensch, Inst. Limnol., Gaisberg 116, A-5310 Mondsee, Austria.>> Six out of 24 rotifer species recorded from the lake were quantitatively important (*Horaella brehmi, Brachionus angularis, B. caudatus, Keratella tropica, Filinia longiseta* and *F. opoliensis*, and three others were common (*Brachionus falcatus, Asplanchna sieboldi* and *Conochiloides natans*. Rotifer peaks were correlated with rainy periods and relatively clear water, which coincide with the European spring and autumn. All species were able to deal with hypoxic conditions. A clear niche separation can be observed between different genera and between species of the same genus. The population dynamics of the rotifers seem to be ruled by repeated irregular environmental fluctuations. Rainfall appears to be a primary steering factor.

45: KLEINOW, W. & A. ROHRIG, 1995. Enzyme activity measurements on isolated organs of *Brachionus plicatilis* (Rotifera). *Hydrobiologia* 313, 171-174. <<Univ Cologne, Inst Zool, Weyertal 119, D-50923 Cologne, Germany.>> A method is described by which the integument of Brachionus plicatilis, together with its intracellular lamina, is quickly dissolved before other parts or tissues of the animal are destroyed. After removing the integument several parts of the body can be separated and fractionated in a more or less intact state by centrifugation in a Percoll gradient. The measurement of enzyme activities has indicated that this procedure might provide a way of localizing enzymes within the rotifer body

46: KLEINOW, W. & H. WRATIL, 1995. SEM of internal structures of Brachionus plicatilis (Rotifera). *Hydrobiologia* 313, 129-132. << Univ Cologne, Inst Zool, Weyertal 119, D-50923 Cologne, Germany.>> Examination by scanning electron microscopy of sectioned rotifers provides views on their internal structures which complement the results of other

techniques. Thus, additional information has been obtained for example, on the digestive tract, on nerve connections and on the morphology of the mastax. Our observations confirm that nearly all organs are connected in some way to the integument, suggesting that integument structures may be responsible for the holding together of the whole rotifer body.

47: KORSTAD, J., A. NEYTS, T. DANIELSEN, I. OVERREIN & Y. OLSEN. 1995. Use of swimming speed and egg ratio as predictors of the status of rotifer cultures in aquaculture. *Hydrobiologia* 313, 395-398. <<Oral Roberts Univ, Dept Biol, Tulsa, OK 74171 USA.>> Egg ratio was determined to be a suitable predictor of rotifer growth and production in the cultures. However, at this time egg ratio dynamics are not suitably understood to predict in advance a sudden population collapse. Swimming speed of reproductive, egg-carrying females in the exponential growth phase was 40-45 mm min^{-1}. Both environmental factors (e.g., accumulating metabolites) and changes in nutritional state of the rotifers may have affected the swimming speed, but environmental factors appear to be the most important. We believe that swimming speed has the potential of becoming an accurate predictor of culture quality in mass cultures of rotifers.

48: KOTIKOVA, E.A. 1995. Localization and neuroanatomy of catecholaminergic neurons in some rotifer species. *Hydrobiologia* 313, 123-127. <<Russian Acad Sci, Inst Zool, St Petersburg 199034, Russia.>> *Dicranophorus* sp., *Platyias quadricornis* (Ehrb.) and *Rotaria tardigrada* (Ehrb.), systematically distant, show the same pattern of the catecholaminergic (CA-ergic) part of the nervous system. It is formed of a small (23-24), but steady number of neurons characteristic for each species. Three types of CA-ergic neurons are described. The sizes of neurons vary from to two to ten μm. The distribution of the brain neurons is correlated with body shape. Such a type of nervous system is topographically comparable to the concentrated orthogon of the flatworms.

49: KREUTZWEISER, D.P. & D.R. THOMAS, 1995. Effects of a new molt-inducing insecticide, tebufenozide, on zooplankton communities in lake enclosures. *Ecotoxicology* 4, 307-328. <<Canadian Forest Serv, Inst Forest Pest Management, 1219 Queen St E, Sault St Marie, on P6A 5M7, Canada.>> Tebufenozide (RH-5992-2F) was applied to large lake enclosures and the effects on zooplankton communities were evaluated. There were significant treatment effects at all test concentrations (0.07-0.66 mg L^{-1} tebufenozide). Significant increases in abundance of rotifers in treated enclosures at the three higher test concentrations were coincident with reductions in cladocerans and indicated secondary effects of the insecticide on the abundance of microzooplankton. Recovery of zooplankton communities in the enclosures occurred within 1-2 months at 0.07 and 0.13 mg l(-1) and by the following summer (12-13 months) at 0.33 and 0.66 mg l(-1).

50: KUCZYNSKI, D. 1995. Rotiferological dictionary in five languages. *L.O.L.A. Monogr.* 8, 1-115. <<Inst. Ecol., Univ. de Moron, Cabildo 134, 1708 Moron, Argentina.>> Provides >60 pp in tabular form of terms used in rotifer morphology, physiology, taxonomy, ecology, methodology, etc., in English,

French, German, Portuguese & Spanish, with numbered diagrams of relevant animals, plus alphabetical listings in each language ($US10 from author).

51: KUTIKOVA, L.A. 1995. Larval metamorphosis in sessile rotifers. *Hydrobiologia* 313, 133-138. <<Russian Acad Sci, Inst Zool, St Petersburg 199034, Russia.>> Postnatal development of six species of sessile rotifers in the families Flosculariidae (*Floscularia decora, Lacinularia flosculosa, Limnias ceratophylli, Ptygura crystallina*) and *Collothecidae (Collotheca ornata, Stephanoceros fimbriatus*) was investigated by observing free-swimming and newly settled larvae until they metamorphosed into adults. Three variants of metamorphosis were observed. A hypothetical explanation of changes of the coronal construction of orders Gnesiotrocha and Pseudotrocha is considered.

52: KUTIKOVA, L.A. & C.H. FERNANDO, 1995. *Brachionus calyciflorus* Pallas (Rotatoria) in inland waters of tropical latitudes. *Int. Rev. ges. Hydrobiol.*80, 429-441. <<Address above.>> Geographical variation in *B. calyciflorus* is described. The subspecies *B. c. borgerti* Apstein is redescribed and its status confirmed. Distribution patterns indicate that rotifers are not cosmopolitan, and that dispersal centres are evident for *B. calyciflorus* and the subspecies *borgerti*.

53: KUTIKOVA, L.A. & M. SILVA-BRIANO, 1995. *Keratella mexicana* sp. nov., a new planktonic rotifer from Aguascalientes, Mexico. *Hydrobiologia* 310, 119-122.<<address above.>> A new species of *Keratella* is described from a small reservoir in Aguascalientes, Mexico. The species appears related to *K. slacki* Berzins, 1963 and *K. lenzi* Hauer, 1953.

54: LANGLEY, J.M., S. KETT, R.S. ALKHALILI & C.J. HUMPHREY, 1995. The conservation value of English urban ponds in terms of their rotifer fauna. *Hydrobiologia* 313, 259-266. <<Middlesex Univ, Trent Pk, London N14 4XS, England.>> The rotifer assemblages of 26 urban ponds have been compared with the preliminary English national classification of small water bodies. It was found that similar TWINSPAN indicator species occurred in both classifications and that the urban ponds were classified appropriately as permanent, lowland sites, with intermediate conductivity. The conservation value of these sites (in terms of species richness) was found to be similar to relatively undamaged sites upon comparable geology, indeed mean values were higher from urban sites. The size of the buffer zone around the pond was highly correlated with species richness ($p < 0.01$) and negatively correlated with lead ($p < 0.05$) and phosphate ($p < 0.05$). It is suggested that conservation management may be better targeted if more attention is paid to the maintenance and enhancement of the buffer zone.

55: LOPEZ, C. & E. OCHOA, 1995. Rotiferos (Monogononta) de la Cuenca del Rio Guasare-Limon, Venezuela. [Rotifers of the Guasare-Limon River basin, Venezuela]. *Revista de Biologia Tropical* 43, 189-193. <<Univ. Zulia, Fac. Ciencias Exptl, Dept Biol., Apdo 526, Maracaibo 4011A, Venezuela.>> The study of rotifer samples from 17 localities in the Guasare-Limon River Basin, western Lake Maracaibo Basin, Venezuela, yielded a systematic list of 93 taxa. Of these, 30 species and three genera are new records for the Lake

Maracaibo Basin. The genera *Lecane* and *Brachionus* were the most diverse, together representing half of those on record. The rotifer fauna in this region is composed of cosmopolitan (54.22%), pantropical or neotropical (30.12%) and thermophilous taxa [16.86%).

56: LUBZENS, E., D. RANKEVICH, G. KOLODNY, O. GIBSON, A. COHEN, & M. KHAYAT, 1995. Physiological adaptations in the survival of rotifers (*Brachionus plicatilis*, O.F. Müller) at low temperatures. *Hydrobiologia* 313, 175-183. <<Natl Inst. Oceanog., Israel Oceanog. & Limnol. Res., POB 8030, IL-31080 Haifa, Israel.>> Experimental results showed relatively high survival rates (82-85%) in rotifers that were cultured at 25 °C and exposed later to -1 °C for 12-14 days. The acclimation period was associated with the synthesis of at least one specific protein and accumulation of lipids. Profiles of protein synthesis in rotifers incubated at 10 °C revealed a 94 kD protein, which did not appear in rotifers cultured at 25 or 37 °C. Immunoisolation, using a polyclonal antibody that was prepared against HSP60, revealed that this protein was synthesized in rotifers kept at 10, 25 or 37 °C. However, this antibody did not react with the 94 kD peptide. In addition, rotifers kept at 10 °C accumulated substantial amounts of lipids, including eicosapentaenoic acid, which is found in the algae fed to them. These results support the hypothesis of specific adaptations to survival at low temperatures during an acclimation period.

57: MATHES, J. & H. ARNDT, 1995. Annual cycle of protozooplankton (ciliates, flagellates and sarcodines) in relation to phyto- and metazooplankton in Lake Neumuhler See (Mecklenburg, Germany). *Arch. Hydrobiol.* 134, 337-358. <<Landesamt Umwelt & Nat., Mecklenburg Vorpommern, Seenprojekt MV, Pampower Str 66-68, D-19061 Schwerin, Germany.>> Protozooplankton percentage contribution to total zooplankton biovolume ranged between 3 % and 78 % and was about 21 % of annual average total biovolume. The seasonal dynamics of the protozoan community may well be explained by changes in the impact of bottom-up and top-down effects. Small centric diatoms may have supported the growth of protozoans in early spring; copepods and daphnids probably exerted a strong grazing pressure during late spring. High temperatures and low predation pressure may have supported a protozoan peak during summer which was then probably reduced by metazoan predation (rotifers).

58: MAY, L. 1995. The effect of lake fertilisation on the rotifers of Seathwaite Tarn, an acidified lake in the English Lake District. *Hydrobiologia* 313, 333-340. <<Inst Terr Ecol, Inst Freshwater Ecol, Bush Estate, Penicuik EH26 0QB, Midlothian, Scotland.>> Describes the planktonic rotifer community for two years before fertilisation (1990-1991), and for a further two years once treatment had begun (1992-1993). Eutrophication had little effect on the species composition of the rotifer assemblage, which continued to reflect the acid, oligotrophic nature of the untreated lake. However, there were marked changes in the levels of abundance of most planktonic species. Population dynamics of the dominants are described.

59: MELONE, G. & C. RICCI, 1995. Rotatory apparatus in bdelloids. *Hydrobiologia* 313, 91-98. <<Univ Milan, Dept Biol, Via Celoria 26, I-20133

Milan, Italy.>> We have analyzed the fine morphology of the corona and the rostrum from species belonging to the Habrotrochidae, Philodinidae, Adinetidae and Philodinavidae, each with its own form of feeding and locomotion. The rostrum has a sensorial area and a ciliated area. The former is common to all bdelloids, while the latter is lacking in the Adinetidae. There are 3 models of corona: 1) a simple ciliated field of undifferentiated cilia (Adinetidae), 2) a well developed ciliated field with specialized cilia forming the paired trochi on the disks and the cingulum (Habrotrochidae and Philodinidae), and 3) a ciliated field with a single trochus encompassing rudimentary pedicels and cingulum (Abrochtha). We propose (1) to no longer use Digononta as a taxon, (2) to assign the class rank to Bdelloidea, (3) to distinguish three orders, grouping Philodinidae and Habrotrochidae under a single order and (4) to retain the current families.

60: MIRACLE, M.R. & X. ARMENGOL-DIAZ, 1995. Population dynamics of oxiclinal species in lake Arcas-2 (Spain). *Hydrobiologia* 313, 291-301. <<Univ. Valencia, Fac. Bio.l, Dept Eco.l & Microbiol., E-46100 Burjassot, Valencia, Spain.>> 'Oxiclinal' rotifer species show high concentrations just above the oxic-anoxic interface in the hypolimnion of some lakes. We evaluated female, male and egg numbers of the two main oxiclinal species of lake Arcas-2: *Filinia hofmanni* and *Anuraeopsis fissa*, during two annual cycles (1990-91). *F. hofmanni* was an exclusive oxiclinal species. It had an exponential growth phase at the onset of stratification giving a distinct spring peak. The annual cycle of *A. fissa* is displaced with respect to that of *F. hofmanni*: *A. fissa* attained greatest densities during summer, until the autumn overturn. *A. fissa* occured throughout the vertical profile and secondarily occupied the oxicline.

61: MNATSAKANOVA, E.A. & L.V. POLISHCHUK. 1996. Role of parthenogenetic natality and emergence from diapausing eggs in the dynamics of some rotifer populations. *Hydrobiologia* 320, 169-178. <Moscow MV Lomonosov State Univ., Fac. Geog., Dept Hydrol., Moscow 119899, Russia.> Direct estimates of rotifer emergence from bottom resting eggs are given. For rotifer populations studied, emergence from diapausing eggs is generally less important than parthenogenetic births, when both are regarded as an immediate cause of population growth. This is in sharp contrast to the data available for some crustaceans (De Stasio, 1990) where the role of emergence from diapausing eggs in population dynamics has been clearly shown.

62: MORALES-BAQUERO, R. & L CRUZ-PIZARRO, 1995. Effects of fluctuating temperatures on the population dynamics of *Hexarthra bulgarica* (Wiszniewski) from high mountain lakes in Sierra Nevada (Spain). *Hydrobiologia* 313, 359-363. <<Univ Granada, Fac. Ciencias, Dept Biol. Anim. & Ecol., E-18071 Granada, Spain.>> Since the capacity of *H. bulgarica* to perform vertical migrations in these lakes of Sierra Nevada is already known, we have studied the relationship between egg ratios and chlorophyll-a concentration, mean temperatures and temperature instability (measured as the daily rate of temperature change - TCR - as well as the surface-bottom temperature difference - SBT -) in both lakes. Results show that the intensity of temperature fluctuations has a positive effect on the egg-ratios, as TCR is only correlated with that variable in the shallow lake and SBT is only correlated with egg-ratios in the deeper one.

63: MUNA, L., P. GUIDO, J. COLIN, D.C. WIM & S. KARL, 1995. Toxicity evaluations of wastewaters in Austria with conventional and cost-effective bioassays. *Ecotoxicol. Environm. Safety* 32, 139-146. << Vienna Tech Univ, Inst Wassergute, A-1040 Vienna, Austria.>> The acute toxicity of 42 samples of different types of domestic and industrial discharges was assessed. Toxkit bioassays were as sensitive as the *D. magna* acute test. The crustacean *T. platyurus* was in 75% of the toxic samples more sensitive than *D. magna*. Relationships between the chemical composition and the toxicity of the discharges could be established in some cases, but not in others, which confirms the difficulties of extrapolating toxic hazards of complex wastes from (mostly restricted) chemical analyses. This study demonstrates the potential of cost-effective bioassays (such as, e.g., cyst-based Toxkits) as attractive alternatives to (expensive) conventional bioassays for routine monitoring of effluents and wastes.

64: MUNRO, P.D., H.A. MCLEAN, A. BARBOUR & T.H. BIRKBECK, 1995. Stimulation or inhibition of growth of the unicellular alga *Pavlova lutheri* by bacteria isolated from larval turbot culture systems. *J. Appl. Bacteriol.* 79, 519-524. << >> During growth of larval turbot in aquaculture the first food supplied is usually the rotifer, *Brachionus plicatilis* and algae are commonly included in the system as food for the rotifers, thereby maintaining their nutrient quality. As bacteria are known to influence markedly the survival of larval turbot, the effect of bacteria, isolated from larval turbot, on growth of *Pavlova lutheri* was measured over a 3-d period. Results indicated that if bacteria are to be selected which are beneficial (probiotics) in larval rearing systems their possible interaction with algae must be considered.

65: OLESEN, N.J. 1995. Clearance potential of jellyfish *Aurelia aurita*, and predation impact on zooplankton in a shallow cove. *Mar. Ecol. Prog. Ser.* 124, 63-72. <<Natl Environm Res Inst, Vejlsovej 25, POB 314, DK-8600 Silkeborg, Denmark.>> In the shallow cove Kertinge Nor, Denmark, clearance by *A. aurita* as a function of medusae size and water temperature was measured in the laboratory using copepods (*Acartia tonsa*) and rotifers (*Brachionus plicatilis*) as prey. In spring, when medusa were small, the population in Kertinge Nor could potentially have cleared the volume of water in the cove less than 0.1 times each day. This value was 3.5 times each day in late summer when biomass was high. High predation pressure by medusae appears to control zooplankton in the shallow cove, at least during summer and early fall, and *A. aurita* may thus be considered as a keystone species in the control of the trophic structure in Kertinge Nor.

66: ÖRSTAN, A. 1995. Desiccation survival of the eggs of the rotifer *Adineta vaga* (Davis, 1873). *Hydrobiologia* 313, 373-375. <<13348 Cloverdale Pl, Germantown, MD 20874 USA.>>Age at the time of drying affects the desiccation survival of the embryos of the bdelloid rotifer *Adineta vaga*. Although the embryos younger than 24 hours do not survive desiccation, up to 71% and 6% of the embryos at least 45 hours old survive desiccation for 2 and 10 days, respectively.

67: ÖRSTAN, A. 1995. A new species of bdelloid rotifer from Sonora, Mexico. *Southw. Nat.* 40, 255-258. <<Address above.>> A new species of bdelloid rotifer, *Macrotrachela sonorensis* is reported from a desert in Sonora, Mexico. The new species is characterized by the shape of its spurs, its short and curved foot, the shape of its head during creeping, and the dorso-lateral spines on the antenna pseudo segment.

68: ÖRSTAN, A. 1995. A pathological condition in a bdelloid rotifer. *Quek. J. Microscopy* 37, 489-490. <<Address above.>> A rotifer identified as *Philodina morigera* Donner, 1949 from a Californian tree trunk algal sample was found to have an impediment to opening one lobe of its corona. The condition and subsequent activity of the animal are described.

69: PEJLER, B. 1995. Relation to habitat in rotifers. *Hydrobiologia* 313, 267-278.,<<Inst Limnol., Norbyvagen 20, S-75236 Uppsala, Sweden.>> Many rotifers are more or less euryecious, while relatively few are strongly restricted in their choice of habitat. In extreme environments a low number of species is found, but often a high number of individuals within these species. These rotifers are usually primary consumers, and for natural reasons extreme environments are characterized by a low number of trophic levels. Adaptations to deviating chemical and physical environments may develop relatively rapidly (seen from a geological perspective), while the more fundamental changes (occurring during a longer period of time) seem to be a response to biotic factors (e.g., the development of different types of trophi for facilitating food collection).

70: PONTIN, R.M. & R.J. SHIEL, 1995. Periphytic rotifer communities of an Australian seasonal floodplain pool. *Hydrobiologia* 313, 63-67. <<26 Hermitage Woods Crescent, Woking GU21 1UE, Surrey, England.>> Rotifers numbered from about 10 to 150 per 100 ml and formed about 2 to 20% of the microfaunal community. Numbers of rotifers, and numbers of rotifer species, varied with different macrophytes ($\chi 2$ tests, $P<0.001$ in each case), with the greatest numbers under *Azolla*. Interannual variability in both macrophytes and rotifers was apparent ($\chi 2$ test, $P<0.001$).

71: RICCI, C. 1995. Growth pattern of four strains of a Bdelloid rotifer species: Egg size and numbers. *Hydrobiologia* 313, 157-163. <<Univ Milan, Dept Biol, Milan, Italy.>> Life-history traits and growth patterns of four strains *of Macrotrachela quadricornifera* (Rotifera, Bdelloidea) were studied to assess the influence of maternal traits on egg size. There were two small (S, Va) and two large strains (H, G) with similar patterns of life cycle and body growth. They allocated to reproduction similar relative amounts of resources partitioned into eggs of similar relative size. All strains started reproduction while growing and, although their final sizes differed, at maturity had similar large or small sizes but different ages. Their egg sizes were unaffected by the 'clutch' size, but were positively correlated with mother's body size.

72: RICO-MARTINEZ, R. & T.W. SNELL, 1995. Mating behavior and mate recognition pheromone blocking of male receptors in *Brachionus plicatilis* Müller (Rotifera). *Hydrobiologia* 313, 105-110. <<Georgia Inst. Technol, Sch. Biol., Atlanta, GA 30332 USA.>> Copulatory behavior of three S and three L

type *B. plicatilis* strains from different geographic areas was analyzed. A 29 KD surface glycoprotein on females, characterized as a Mate Recognition Pheromone (MRP), binds to receptors in the corona of males and blocks mate recognition. Blocking was observed in all S and L strains even though the MRP was isolated from a single L-type strain. Binding was quantified using image analysis and a 20-fold difference was observed among strains. A direct relationship between the male discrimination of females and the intensity of MRP binding to male receptors was found. This relationship might be useful as a tool to examine variation in the mate recognition systems of other rotifer species.

73: ROBIN, J.H. 1995. Effect of diets containing gamma-linolenic acid on n-6 highly unsaturated fatty acid content of rotifer (*Brachionus plicatilis*). *Hydrobiologia* 313, 185-190. <<Inst. Francais Rech. Exploitat. Mer, Ctr Brest, Unite Mixte Nutr. Poissons, Inra Ifremer, BP 70, F-29280 Plouzane, France.>> Describes the effect of various diets containing linoleic and/or gamma-linolenic acids on n-6 fatty acid composition of the rotifer *Brachionus plicatilis*. Rotifers fed with inert diet with *Spirulina* contained arachidonic acid while those fed with borage oil had very low arachidonic content. High level of n-3 fatty acids incorporated into the diets seemed to exert inhibitory effects on n-6 transformation rate.

74: ROTHHAUPT, K.O. 1995. Algal nutrient limitation affects rotifer growth rate but not ingestion rate. *Limnol. Oceanogr.* 40, 1201-1208. <<Max Planck Inst Limnol, Dept Physiol Ecol, POB 165, D-24302 Plön, Germany.>> *Brachionus rubens* did not differentiate between nonnutrient-limited and nutrient-limited *Scenedesmus* and ingested both at comparable rates. The rotifers reached highest maximum growth rates with nonnutrient-limited *Scenedesmus*. With regard to the high N content of *Brachionus*, direct mineral N deficiency of the food appears to be possible. P-limited algae (*Scenedesmus* and *Cyclotella*) permitted no positive growth rates of the rotifers at all. P-limited algae that were short-term enriched with phosphate contained similar amounts of P as nonnutrient-limited algae but still were of lower nutritional quality, thus suggesting the importance of essential biochemical constituents.

75: RUBLEE, P.A. & N. BETTEZ, 1995. Change of microplankton community structure in response to fertilization of an arctic lake. *Hydrobiologia* 312, 183-190. <<UNCG, Dept Biol, Greensboro, NC 27412 USA.>> Rotifer abundance and biomass was not significantly different among summers, although one species, *Conochilus natans* that had not been seen previously, was present during the second and third year of fertilization. By the third year of fertilization both protozoan and rotifer biomass had declined from peak levels, while crustacean zooplankton nauplius abundance had increased suggesting the emergence of top-down regulatory controls as the lake became eutrophic.

76: SANOAMUANG, L.O., H. SEGERS & H.J. DUMONT,1995. Additions to the rotifer fauna of south-east Asia: New and rare species from north-east Thailand. *Hydrobiologia* 313, 35-45. <<Khon Kaen Univ, Fac Sci, Dept Biol, Khon Kaen 40002, Thailand.>> 200 rotifer species, 120 of which are new to Thailand, were identified from 93 habitats. *Brachionus africanus* Segers, *B.*

lyratus Shephard and *Trichocerca hollaerti* De Smet are new to Asia. *Brachionus niwati* n.sp. is described and figured. *Brachionus donneri* Brehm, *Keratella edmondsoni* (Ahlstrom) and *Lecane blachei* Berzins, endemic to south and southeast Asia, were found also. Of special zoogeographic interest is the record of several species previously considered endemic to Australia. An attempt is made to characterise the Thai rotifer fauna in the light of recent developments in rotifer zoogeography.

77: SARTONOV, A. 1995. Effects of *Microcystis aeruginosa* on interference competition between *Daphnia pulex* and *Keratella cochlearis*. *Hydrobiologia* 307, 1-3. <<Dartmouth Coll., Dept Biol. Sci., Hanover, NH 03755 U.S.A.>> The presence of *Microcystis* caused a significant reduction in daphniid body size and decreased the ability of both nonacclimated and acclimated daphniids to suppress rotifers. *Keratella* inhalation and mortality are positively correlated with filtering rates and body size of *Daphnia*. Therefore, the feeding rates and size structure of a *Daphnia* population will determine its potential to interfere with vulnerable rotifers. In all experiments the presence of *Microcystis* significantly decreased the ability of *Daphnia* to interfere with this rotifer despite the fact that *Keratella* was also inhibited. In the field this effect might be augmented if *Microcystis* colonies are more easily ingested by cladocerans than by the rotifers.

78: SAUNDERS-DAVIES, A. 1995. Factors affecting the distribution of benthic and littoral rotifers in a large marine lagoon, together with the description of a new species. *Hydrobiologia* 313, 69-74. <<Univ Surrey, Sch Biol Sci, Guildford GU2 5XH, Surrey, England.>> Some of the physical and chemical characteristics of The Fleet, Dorset, were examined and related to rotifer total abundance and species richness. A preliminary list of species found at different sampling stations is given. A strong negative correlation between salinity and total abundance was found. A similar negative correlation between species richness and salinity was also found. A description of *Proales fleetensis* sp. nov. is given.

79: SCHMID-ARAYA, J.M. 1995. Disturbance and population dynamics of rotifers in bed sediments. *Hydrobiologia* 313, 279-290. <<Austrian Acad. Sci., Inst. Limnol., Biol. Stn Lunz, Seehof 4, A-3293 Lunz Am See, Austria.>> The distribution of five rotifer species in sediments revealed different temporal and spatial patterns. The effect of variables such as water level, surface discharge and variation of the groundwater level was tested upon the densities of each species. Despite the spring spate, the species are able to persist due to the presence of low-flow refuge habitats or the dispersion into deeper layer of the hyporheic interstitial.

80: SCHMID-ARAYA, J.M. 1995. New records of rare Bdelloidea and Monogononta Rotifers in gravel streams. *Arch. Hydrobiol.* 135, 129-143. <<Austrian Acad Sci, Inst Limnol, Biol Stn Lunz, Seehof 4, A-3293 Lunz Am See, Austria.>> Rare rotifer species have been newly found in two different gravel streams (Oberer Seebach, Austria; and Afon Mynach, North Wales, Great Britain). The taxonomy and habitat distribution is revised, and confirmed for: *Philodinavus paradoxus* (Murray), *Henoccros falcatus* (Milne), *Microcodides chlaena* (Gosse), *Proalinopsis caudatus* (Collins), *Dicranophorus dfflugiarum* (Penard), *Wigrella depressa* Wiszniewski and *Myersinella*

tetraglena (Wiszniewski). *H. falcatus* is the first European record outside Great Britain, and it was found for the first time 78 years after it was described. Similarly, *W. depressa* and *M. tetraglena* were found after 58 years. The presence of Rotifera in the hyporheos, and video observations of their feeding behaviour are also discussed.

81: SEGERS, H.J. 1995. Nomenclatural consequences of some recent studies on *Brachionus plicatilis* (Rotifera: Brachionidae). *Hydrobiologia* 313/314, 121-122. <<Lab. of Anim. Ecol., Zoogeog. & Nat. Cons., K.L. Ledeganckstr. 35, B-9000 Gent, Belgium.>> Reviews recent studies which suggest specific separation of the 'L-' and 'S-type' *Brachionus plicatilis* into *B. plicatilis* Müller, 1786 and *B. rotundiformis* Tschugunoff, 1921, respectively.

82: SEGERS, H. 1996. The biogeography of littoral *Lecane* Rotifera. *Hydrobiologia* 323, 169-197. <>address above.>> Detailed analysis of the distribution patterns of 167 verified *Lecane* morphospecies. 41% are widely distributed. Only 13% are cosmopolitan. Endemicity varies from 6.5-21.8%. The large range of many morphospecies is discussed - insufficient taxonomic resolution may be responsible for some of the apparently large ranges.

83: SEGERS, H. & H.J. DUMONT, 1995. 102+ rotifer species (Rotifera: Monogononta) in Broa Reservoir (SP., Brazil) on 26 August, 1994, with the description of three new species. *Hydrobiologia* 316, 183-197. <<address above.>> 12 samples collected from Broa Reservoir on this date contained >102 rotifer spp. incl. *Ascomorpha tundisii* n. sp., Lecane *broaensis* n.sp., and *Lepadella neglecta* n.sp., which are described, with taxonomic comments on these and other species.

84: SHIEL, R.J. & J.D. GREEN, 1996. Rotifera recorded from New Zealand, 1859-1995, with comments on zoogeography. *N.Z J. Zool.* 23, 191-207. <<MDFRC, PO Box 921, Albury, NSW 2640, Australia.>> A review of rotifer records from N.Z. lists ca. 390 species recorded from the region. The apparently low endemism (<5%) of the N.Z. Rotifera probably reflects the prevailing view of cosmopolitanism in early studies, or simply poor taxonomic resolution.

85: SNELL, T.W. & C.R. JANSSEN. 1995. Rotifers in ecotoxicology: A review. *Hydrobiologia* 313, 231-247.<<Georgia Inst Technol, Sch Biol, Atlanta, GA 30332 USA.>> The greater use of rotifers has been due to their central role in freshwater planktonic communities, the ease and speed of making quantitative measurements of mortality and reproduction, their sensitivity to common pollutants, the commercial availability of cysts, and the existence of reliable, standardized protocols. The main endpoints used in ecotoxicology studies are reviewed and published studies cited, along with the compounds investigated, duration of exposure, and the LC50s, EC50s or NOECs reported. A critique of rotifer use in ecotoxicology is offered and it is concluded that the scientific basis for including rotifers as part of a battery of ecotoxicological tests is well established.

86: SNELL, T.W., R. RICO-MARTINEZ, L.N. KELLY & T.E. BATTLE, 1995. Identification of a sex pheromone from a rotifer. *Marine Biology* 123, 347-353. <<address above.>> A 29 kdalton glycoprotein on the surface of females

of the marine rotifer *Brachionus plicatilis* acts as a contact-mating pheromone. This glycoprotein (gp29) is glycosylated with oligosaccharides containing N-acetylglucosamine, mannose, and fucose residues, and these oligosaccharides are necessary for male recognition of females. Binding of purified glycoprotein to male receptors reduces mating attempts by 93%. An antibody to the glycoprotein binds to females, reducing male mating attempts by 86%. When purified gp29 is bound to sepharose beads, it is sufficient to elicit male mating behavior. This glycoprotein is likely to play a key role in the evolution and maintenance of reproductive isolation in rotifers.

87: SOHLENIUS, B., S BOSTROM & A HIRSCHFELDER, 1996. Distribution patterns of microfauna (nematodes, rotifers and tardigrades) on nunataks in Dronning Maud Land, East Antarctica. *Polar Biology* 16, 191-200. <Swedish Museum Nat Hist,Dept Invertebrate Zool, Box 50007, S-10405 Stockholm, Sweden.> Describes occurrence of nematodes, rotifers and tardigrades in 93 soil samples from 11 nunataks. The number of species recorded from the area has now increased from 27 to 34. The number of rotifer species in a particular sample varied from nought to seven. Rotifers occurred in most of the samples (76%) with a maximum density of 750 specimens/gram dry weight.

88: SOMMARUGA, R. 1995. Microbial and classical food webs: A visit to a hypertrophic lake. *FEMS Microbiology Ecology* 17, 257-270. <<Innsbruck Univ, Inst Zool & Limnol, Technikerstr 25, A-6020 Innsbruck, Austria.>> The zooplankton community in the urban, hypertrophic Lake Rodo (Uruguay) was numerically dominated by rotifers and ciliates; cladocerans were rare during most of the year. The rotifer abundance was very high (up to 10^5 ind. l^{-1}), the bacterivorous *Anuraeopsis fissa* being the most abundant species. Results support the general trend for increased bacterial production with increasing trophic status, and suggest a lower energy transfer efficiency to higher trophic levels in hypertrophic lakes due to the many trophic interactions involved.

89: STARKWEATHER, P.L. 1995. Near-coronal fluid flow patterns and food cell manipulation in the rotifer *Brachionus calyciflorus*. *Hydrobiologia* 313, 191-195. <<Univ Nevada, Dept Biol Sci, Las Vegas, NV 89154 USA.>> *B. calyciflorus* is able to differentially capture or deflect potential food cells depending on the overall density (numbers μl^{-1}) and size of suspended particles encountered while feeding. Fluid flow in all areas of the *B. calyciflorus* corona is at very low Reynolds Number (Re), with calculated values always less than 10^{-1}. Rremoval of cells from feeding currents probably is not due to sieving but is more likely due to direct interception of particles by individual ciliary elements. Certain large cells - such as *Euglena gracilis* - are retained in the inner pseudotrochal space for up to 500 msec, ample time for *B. calyciflorus* to assess the physical and chemical characteristics of this or other potential foods.

90: TELESH, I.V. 1995. Rotifer assemblages in the Neva Bay, Russia: Principles of formation, present state and perspectives. Hydrobiologia 313, 57-62. <<Russian Acad Sci, Inst Zool, St Petersburg 199034, Russia.>> The rotifer fauna in the central basin of Neva Bay is determined by and originates

in Lake Ladoga and is very similar to that of the Neva River. High turbidity and effect of winds affecting water residence time influence composition and density of rotifers in this shallow estuary. The importance of rotifer assemblages for evaluation of the quality of the estuary is discussed.

91: TURNER, P.N. 1995. Rotifer look-alikes: two species of *Colurella* are ciliated protozoans. *Invert. Biol.* 114, 202-204. <Dept of Biol. Sci., Wichita State Univ., Wichita, KS 67260, USA.> *Colurella monodactylos* and *C. althausae*, described from marine interstitial sands of the Black Sea and Caribbean, respectively, are significantly different from their congeners. Although no type specimens were deposited for either species, published drawings or photographs provide enough evidence to conclude that both of these "rotifers" are in fact ciliated protists of the family Dysteriidae, probably of the genus *Dysteria*.

92: TURNER, P.N. 1996. Preliminary data on rotifers in the interstitial of the Ninnescah river, Kansas, USA. *Hydrobiologia* 319, 179-184. <Address above.> 105 rotifer species were identified from a sandy, plains river in Kansas, USA (the Ninnescah river). Of those rotifers identified, eighty occurred only in the interstitial sand, fifty-six in only the flow as plankton, and thirty-one from both habitats. New records for the US include *Encentrum wisszniewski* Wulfert, *E. longidens* Donner and *E.* (*Parencentrum*) *longipes* Wulfert. A small form of *Lecane levistyla* Olofsson is further examined and discussed.

93: VIRRO, T. 1995. The genus Polyarthra in Lake Peipsi. *Hydrobiologia* 313, 351-357.<<Tartu State Univ, Inst Zool & Hydrobiol, 46 Vanemuise St, Tartu 2400, Estonia.>> In Lake Peipsi (Estonia) *Polyarthra* species often dominate the rotifer community, and are represented by 6 species: *P. dolichoptera* Idelson, *P. longiremis* Carlin, *P. luminosa* Kutikova, *P. major* Burckhardt, *P. remata* Skorikov, *P. vulgaris* Carlin. Morphometric data including measurements of body, fins and various types of eggs are given. The seasonal development of the different species and their life cycles are considered.

94: WALLACE, R.L., C. RICCI & G. MELONE, 1995. Through Alice's looking glass: a cladistic analysis of pseudocoelomate anatomy. *Selected Symposia & Monographs U.Z.I.* 8, 61-67.<<Dept. Biology, Ripon College, Ripon WI 5497-0248, U.S.A.>> Summarizes the authors' recent investigations on pseudocoelomate phylogeny based on morphological features. The Rotifera are associated with the Acanthoceophala in a small clade of pseudocoelomates. Characters on which the analysis was based are given, as is the resulting phylogram.

95: WALSH, E.J. 1995. Habitat-specific predation susceptibilities of a littoral rotifer to two invertebrate predators. *Hydrobiologia* 313, 205-211. <<Univ Texas, Dept Biol Sci, El Paso, TX 79968 USA.>> Habitat-specific predation susceptibilities for *Euchlanis dilatata* in the presence of three aquatic macrophytes and two predators (damselfly nymphs - *Enallagma carunculata*; and cnidarians - *Hydra*) are assessed. Rotifer survival was greatest on *Myriophyllum* in the presence of both predators. Conversely, the presence of the other macrophyte species actually increase rotifer suspectibility to predation by damselfly nymphs. I also manipulated plant structural

complexity. As predicted, decreasing the relative complexity of each plant resulted in lower rotifer survival.

96: WALZ, N., S.S.S. SARMA & U. BENKER, 1995 Egg size in relation to body size in rotifers: An indication of reproductive strategy? *Hydrobiologia* 313, 165-170. <<Inst Freshwater & Fish Ecol, Muggelseedamm 260, D-12587 Berlin, Germany.>> Egg sizes and body sizes of 43 egg-bearing rotifer species of numerous, mostly tropical, general have been recorded. Larger absolute egg volumes have been found for larger rotifer species, but the increase was lower than expected in proportion to body size, i.e. the relative egg volume decreased with increasing body size. Obviously the relative investment per offspring is smaller in larger rotifer species.

97: WEITHOFF, G., & N. WALZ, 1995. Influence of the filamentous cyanobacterium *Planktothrix agardhii* on population growth and reproductive pattern of the rotifer *Brachionus calyciflorus*. *Hydrobiologia* 313, 381-386. <<Inst Freshwater & Fish Ecol, Dept Limnol Shallow Lakes & Rivers, Muggelseedamm 260, D-12562 Berlin, Germany.>> *B. calyciflorus* did not grow well on *P. agardhii*. The relative egg volume of females carrying one egg was higher with *Planktothrix* than with *Monoraphidium*. An addition of *P. agardhii* to *M. minutum* led to increasing growth rates. Highest growth rates were found with complementary food sources. The calculated D-E was not effected by different food qualities but the calculated mortality was nearly 3 times higher with *P. agardhii* as food.

98: YUFERA, M. & N. NAVARRO,1995. Population growth dynamics of the rotifer *Brachionus plicatilis* cultured in non-limiting food condition. *Hydrobiologia* 313, 399-405. <<CSIC, Inst Ciencias Marinas Andalucia, Apartado Oficial 11510, Puerto Real, Cadiz, Spain.>> Two *B. plicatilis* strains (L- and S-types) and four microalgae species (*Nannochlorepsis oculata, Nannochloropsis gaditana, Nannochloris oculata* and *Tetraselmis suecica*) have been tested, establishing the dynamics of growth at different daily food rations. Cultures showed a short lag phase, an exponential growth phase, a long post-exponential growth phase and long decline with episodic increases. In both rotifer strains, the best growth was obtained with *Nannochloropsis oculata* and the poorest with *Nannochloris oculata*.

New taxa reported

New rotifers described since the last issue of the newsletter, their country of origin, and the reference in which they are cited, are listed below:

BDELLOIDEA

Macrotrachela sonorensis Örstan, 1995: Mexico (#67)

MONOGONONTA

Ascomorpha tundisii Segers & Dumont, 1995: Brazil [#83]
Keratella mexicana Kutikova & Silva-Briano,1995: Mexico (#53]
Lecane broaensis Segers & Dumont, 1995: Brazil [#83]
Lepadella neglecta Segers & Dumont, 1995: Brazil [#83]
Proales fleetensis Saunders-Davies, 1995: England [#78]

To subscribe to Rotifer News:

Send $US10.00/yr or equivalent, in currency if you can, in international postal order, draft, etc if you cannot to one of the regional editors listed inside the front cover. Preferably, the nearest of Linda May (U.K.), Bob Wallace (U.S.A.) or Russ Shiel (Australia), where accounts are held for subscription.