

ROTIFER NEWS

A Newsletter for Rotiferologists throughout the World

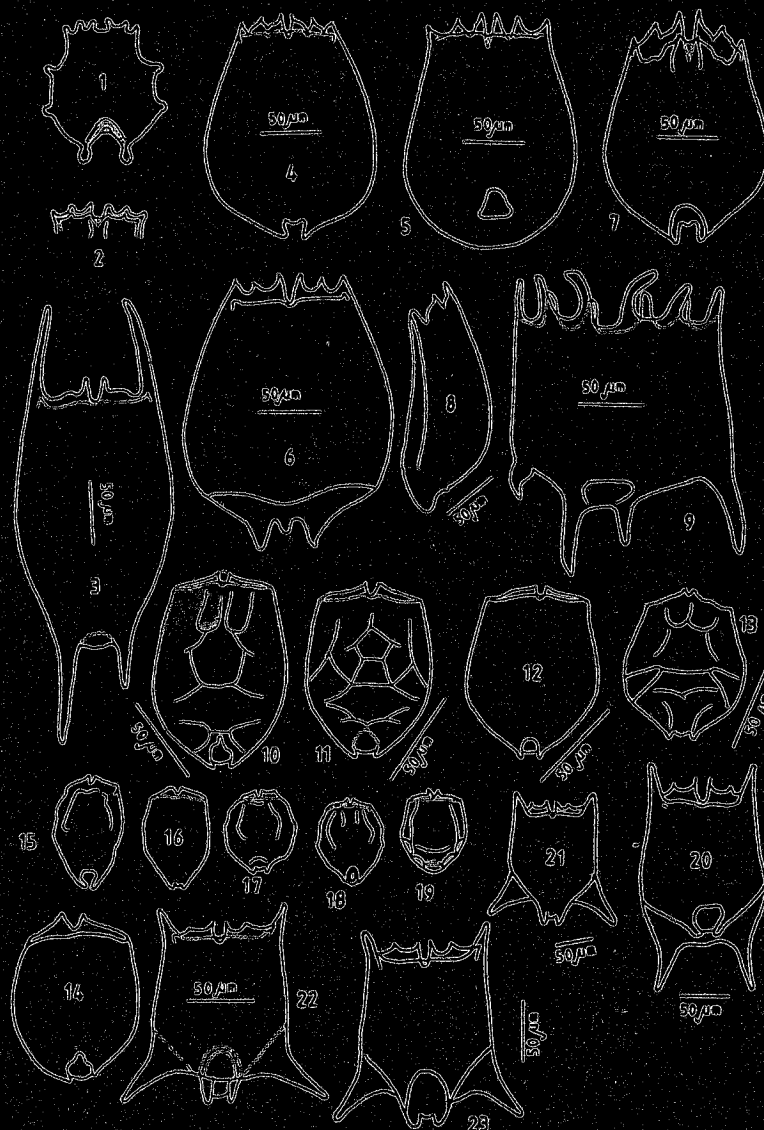


Fig. 1-23. *B. donneri* Brehm: Fig. 1, ventral view & Fig. 2, occipital margin (after Brehm 1951); *B. diversicornis* (Daday): Fig. 3, dorsal view, from Orissa (Sharma 1980a); *B. plicaudis* (O. F. Müller): Fig. 4, dorsal view, from West Bengal (Sharma 1979a); *B. puerodimoides* (Rousselet): Fig. 5, ventral view, from West Bengal (Sharma 1979a); *B. kerdigi* Cohn: Fig. 6, ventral view, from Panjab (Sharma 1981); *B. rubens* Ehrenberg: Fig. 7, ventral view & Fig. 8, lateral view, from West Bengal (Sharma 1979a); *B. papulus* (O. F. Müller): Fig. 9, ventral view, from West Bengal (Sharma 1979a); *B. angularis* (Gosse): Fig. 10, dorsal view, from West Bengal (Sharma 1979a); Fig. 11, dorsal view, from Orissa (Sharma 1980a); Figs. 12 & 13, dorsal and ventral views, from Panjab (Sharma 1981); Fig. 14, ventral view, from Nagpur (Arora 1963); Figs. 15-18, small forms, from Rajasthan (Nayar 1968); Fig. 19, dorsal view, from Sholavaram Lake, South India (Ahlsrom 1940); *B. bideniana* Anderson: Fig. 20, ventral view, from West Bengal (Sharma 1979a); *B. bideniana* f. *crassipolus* (Hauer): Fig. 21, ventral view, from West Bengal (Sharma 1979a); Fig. 22, dorsal view, from Orissa (Sharma 1980a); Fig. 23, ventral view, from Panjab (Sharma 1981). (From Sharma, B.K. The Indian Species of the genus *Brachionus*. Hydrobiologia, 104: 31-69 (1983)).

Editors:

James R. Litton, Jr.
Biology Department
Saint Mary's College
Notre Dame, IN 46556
U.S.A.

Robert L. Wallace
Biology Department
Ripon College
Ripon, WI 54971
U.S.A.

TABLE OF CONTENTS

SECTION	PAGE NUMBER
INTRODUCTION	1
NEWS, NOTES, AND REQUESTS	2
DESCRIPTIONS OF NEW SPECIES	3
RECENT LITERATURE	4
INDEX	45
ROTIFER NEWS QUESTIONNAIRE	48

ROTIFER NEWS is not part of the normal scientific literature (e.g. journals such as ECOLOGY, HYDROBIOLOGIA, LIMNOLOGY AND OCEANOGRAPHY, and VERH INTERNAT VEREIN LIMNOL); therefore, it should not be cited as such. ROTIFER NEWS is a newsletter which prints citations of recent published literature, abstracts of papers published elsewhere, news, and notes about work in progress or such items being submitted for publication in regular scientific journals. ROTIFER NEWS is printed twice a year (each June and December). Please send reprints and/or references, news, notes, requests to either:

James R. Litton, Jr.
Biology Department
Saint Mary's College
Notre Dame, IN 46556
U.S.A.

Robert L. Wallace
Biology Department
Ripon College
Ripon, WI 54971
U.S.A.

PLEASE BE SURE TO INFORM THE EDITORS CONCERNING OTHER
INVESTIGATORS WHO MIGHT WISH TO RECEIVE ROTIFER NEWS.

PRODUCTION OF ROTIFER NEWS

A letter quality copy of ROTIFER NEWS is produced at Ripon College from text files using a DEC PDP 11/70 as a text editor and the system programs EDT (editor) and RNO (runoff). Although we have made considerable progress in the addition of accents and scientific notation, there are still some editing problems with the computer which we have not been able to correct. Two other problems have developed now that we have our BIOSIS searches sent to us on a computer floppy disk. (1) BIOSIS translates all titles into ENGLISH, therefore we may not be printing the correct citation of the paper if it was published in another language. (2) BIOSIS also

has been know to incorrectly or in completely cite abstracts, addresses, etc. The editors encourage authors to send us reprints so that they can be properly cited, abstracted, and annotated for the index. Some of the abstracted material printed below has been copied directly from the author's abstract and/or textual material. Other material was copied from Zoological Record, BIOSIS, or specific information provided by the author. Still other material was abstracted by the editors. Since ROTIFER NEWS is not part of the scientific literature, but is rather a newsletter providing a service to researchers, we do not believe that this practice is an infringement on any copyright laws. A memograph reproduction of the copy is then made and printed at St Mary's College.

NEWS, NOTES, AND REQUESTS

Most items received by either editor on or before (10 May 1985) have been included in this issue of ROTIFERS NEWS (No. 10) all other items will be published in issue No. 11.

The editors are sorry to inform our readers that we must require support in the production of ROTIFER NEWS. As you are well aware, international and even domestic mailing costs are quite high. Production costs are also quite expensive. We are requiring that the readers of ROTIFER NEWS support us in this valuable endeavor by paying the annual dues (\$ 5.00 US dollars). PLEASE FIND ENCLOSED QUESTIONNAIRE/ORDER FORM !! Note that we request that you send your dues and requests for back issues to Jim Litton and materials to be included in the next issue of ROTIFER NEWS to Bob Wallace. This double mailing on your part will save Litton and Wallace about 30 (+) letters between our two institutions for each issue of ROTIFER NEWS that we produce. Readers of ROTIFERS NEWS who wish to may contributions beyond the dues are encouraged to do so !!!! Make all checks payable to ROTIFER NEWS.

1. Back issues of ROTIFER NEWS are still available! If you need a back issue (1-8/9) of ROTIFER NEWS copies are available from Jim Litton at a cost of \$2.00 per issue to cover mailing and reproduction. Your comments on any aspect of ROTIFER NEWS is requested by the editors!

2. WORK IN PROGRESS:

(a) Paul Turner - "An anomaly of the rotifer Lecane (=Monostyla) cornuta (O.F.M.), an atavism?"

(b) M. De Ridder - "Contributions to the knowledge of African rotifers. I. Rotifers from Senegal."; - "Contributions to the knowledge of African rotifers. III. Rotifers from the Ivory Coast."; - Onderzoekingen, IV. Raderdieren van de Ivoorkust."; - "Taxonomical and zoogeographical remarks on Rotifera from the Ivory

Coast."; - with R. pourriot: "Peuplement en Rotifères du vassin de Bandama (Côte d'Ivoire)."

(c) M. Yúfera and E. pascual - "Effects of algal food concentration on feeding and ingestion rates of Brachionus plicatilis in mass culture. Hydrobiologia (in press).

DESCRIPTIONS OF NEW SPECIES

de Paggi, S.B.J. 1982. Notholoca walterkoste sp. nov. y otros Rotíferos dulceacuicolas de la Península Potter, Isla 25 de Mayo (Shetland del sur, Antártida). Rev. Asoc. Cienc. Nat. Litoral 13:81-95. <ABSTRACT: En pequeñas lagunas de agua dulce, se hallaron diez de rotíferos Monogononta correspondientes a los géneros: Cephalodella, Dicranophorus, Epiphanes, Keratella, Lecane, Lepadella, y Notholca. Una nueva especie del género Notholca, N. walterkoste sp. nov., que puede incluirse en el grupo foliacea muy afín a N. verae Kutikowa y N. latistyla (Olofsson).>

DeRidder, M. 1984. Onderzoekingen over de Verspreiding der Raderdieren in Afrika. II. Raderdieren uit Zuid-Tinesië en uit Zuidelijk Afrika. Natuurwet. Tijdschr. 65:155-163. [Notes on the distribution of African Rotifers, II.] <Address: Laboratorium voor morfologie en systematiek der dieren, Rijksuniversiteit Gent, K.L. Ledeganckstraat, 35, 9000-Gent, BELGIUM> <ABSTRACT: A study was conducted on the Rotifer fauna of a series of water samples collected near Zarzis (S. Tunisia) in Zimmanwe and in the coastal area near Durban (Natal, RSA). Thirty five taxa were found, and one was a new "form". Most species are new for the region concerned. [The new form was Lepadella ovalis form undulata.]>

RECENT LITERATURE

The literature cited below has been gleaned from several sources including: BIOSIS, reprints sent to the editors of ROTIFER NEWS by the authors, information provided by various rotiferologists, Zoological Record, etc. The editors wish to thank the many researchers who have taken their time to inform us of relevant materials. We apologize for any incorrect citations which may follow! An attempt is always made to cite works completely and properly. We would like to be informed of any important errors in these citations; corrections will be published in the next issue (Number 11) which is scheduled for late Fall 1985. Most, but not all, of the following list of papers have as their major topic some aspect of rotifer biology. We believe that most of the following papers will be of interest to rotiferologists. These references have been indexed at the end of RECENT LITERATURE section by using such keywords as the specific species names, predation, salinity, biogeography, etc. Suggestions concerning the index are welcome.

OWNERSHIP NOTICE: SOME citations and keyword indexing in the following file are copyrighted selections from BIOLOGICAL ABSTRACTS(R) and-or BIOLOGICAL ABSTRACTS-RRM(R). Information Service, 2100 Arch Street, Philadelphia, PA, 19103, USA. (215)587-4800.

A

Adamkiewicz-Chojnacka, B. and Mrozowska, K. 1983. A cluster analysis of zooplankton numbers in the Vistula Lagoon (Poland). *Oceanologia* 16(0):75-98. <Address: Agric.-Technical Acad. Olsztyn, Inst. Hydrobiol. Water Conservation, POLAND> <ABSTRACT: BIOSIS 28-19124.> <KEYWORDS: Cladocera, Copepoda, Similarity, Eutrophication, Rotifera, Branchiopoda, Copepoda>

Adamkiewicz-Chojnacka, B. 1983. Dynamics of the Vistula Lagoon (Poland) zooplankton numbers. *Oceanologia* 16(0):99-132. <Address: Acad. Olsztyn, Inst. Hydrobiol. Water Conservation, POLAND> <ABSTRACT: BIOSIS 28-19123.> <KEYWORDS: Cladocera, Copepoda, Vertical Distribution, Seasonality, Spatial Distribution, Diversity, Stability, Similarity, Copepoda, Branchiopoda, Rotifera>

Aliev, R.A. 1983. Composition and quantitative development of microzoobenthos in Lake Adzhikabul (Armenian SSR, USSR). *Izv Akad Nauk Az SSR Ser Biol Nauk* 0(2):74-78. <Address: Inst. Zool., Baku, USSR.> <ABSTRACT: BIOSIS: 79-38820. Microzoobenthos was studied in Lake Adzhikabul in 1978-1980. Species and forms (106) belonging to 24 orders were found. New records (34) of ciliates also are recorded from the Caucasus. The quantitative indices of pelophilous biocenosis of microzoobenthos and quantitative indices of microzoobenthos on slime with plant residues in Lake Adzhikabul are given. These data include the following groups: Ciliata, Gastrotricha, Nematoda, Rotifera, Oligochaeta, Hydracarina, Cladocera, Copepoda, Harpacticoida, Ostracoda, Tardigrada and Chironomidae. The microbenthos of the lake was richer than its macrobenthos. Ciliates, prevailed in all the biotopes of the lake, and were the basis of microbenthonic productivity.> <KEYWORDS: Plant, Ciliata, Gastrotricha, Nematoda, Rotifera, Oligochaeta, Hydracarina, Cladocera, Copepoda, Harpacticoida, Ostracoda, Tardigrada, Chironomidae, Ciliata, Gastrotricha, Rotifera, Nematoda, Oligochaeta, Acarina, Branchiopoda, Copepoda, Ostracoda, Tardigrada, Diptera.>

Anderson, R.V., Ingham, R.E., Trofymow, J.A., and Coleman, D.C. 1984. Soil mesofaunal distribution in relation to habitat types in a short grass prairie. *Pedobiologia* 26(4):257-262. <Address: Department of Biological Sciences, Western Illinois University, Macomb, ILL, 61455, USA.> <ABSTRACT: BIOSIS: 78-65990; Five habitat types in a shortgrass prairie were sampled for nematodes, rotifers, and tardigrades. The habitat types included 3 with the dominant vascular plants (blue grama, fringed sage and prickly pear cactus),

one with lichens and one with bare ground where algal mats develop. All of the faunal types occurred in higher densities in soil under the vascular plants. Nematode and tardigrade densities were greatest under blue grama, and rotifers were most abundant under prickly pear. Stylet-bearing nematodes were more closely associated with those habitats with vascular plants. Selective sampling may be necessary in heterogeneous habitats to avoid extreme sample variability.)

Arcifa, M.S. 1984. Zooplankton composition of 10 reservoirs in southern Brazil. *Hydrobiologia* 113(0):137-146. <Address: Dep. de Biol. F.F.C.L., Univ. de Sao Paulo, Ribeirao Preto, Brazil.> <ABSTRACT: BIOSIS 28-15483; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Ceriodaphnia cornuta, Bosminopsis deitersi, Daphnia thermocyclops crassus, Thermocyclops minutus, Brachionus, Keratella, Rotifera, Copepoda, Cladocera, Branchiopoda>

B

Barron, G.L. and Szijarto, E. 1984. Fungal parasites of bdelloid rotifers: A new Phialophora. *Mycologia* 76(6): 1107-1110. <Address: Dep. Environ. Biol., Univ. Guelph, Guelph, Ontario, Canada N1G 2W1.> <ABSTRACT: BIOSIS 28-73749.> <KEYWORDS: Phialophora tribrachispora, Fungi, Rotifera>

Bell, G. 1984. Measuring the cost of reproduction: 1. The correlation structure of the life table of a plankton rotifer. *Evolution* 38(2): 300-313. <Address: Biol. Dep., McGill Univ., Montreal, Que. H3A 1B1, CANADA> <ABSTRACT: BIOSIS: 78-84450. The life tables of 15 clones of the rotifer Platylabus patulus were used to study the variable and acquired survival and fecundity costs. The negative correlations predicted by the cost hypothesis were not found in any case; instead, correlations tended to be positive. This result might be attributable to the peculiarities of the organism; to the procedural details of the experiment; to the general inappropriateness of the laboratory situation; to fundamental logical flaws in the design of passive experiments; to the fallacy or incompleteness of the cost hypothesis; or to the fallacy of the Darwinian interpretation of life histories. A program of experimentation designed to sift these possibilities is outlined.> <KEYWORDS: Platylabus patulus, Survival, Rotifera>

Bell, G. 1984. Measuring the cost of reproduction: 2. The correlation structure of the life tables of 5 freshwater invertebrates. *Evolution* 38(2): 314-326. <Address: Biol. Dep., McGill Univ., Montreal, Que. H3A 1B1, CANADA> <Abstract BIOSIS: 78-82273. Previous work on the rotifer Platylabus patulus showed that the correlations between present reproduction and future reproduction or survival were zero or positive. The same conclusion holds for 5 other asexual freshwater invertebrates, reproducing in diverse ways: 2 oligochaetes (Aelosoma cf. tenebrarum, Pristina cf. aequiseta) which reproduce by paratomical fission, a bdelloid rotifer (Philodina sp.) which produces a single large egg, and an ostracod

(Cypridopsis vidua) and a cladoceran (Daphnia pulex), which produce many small eggs. In almost all cases, individuals or clones with greater present reproduction have as great or greater an expectation of future reproduction. The bdelloid rotifer Philodina was an exception to this rule, there being a strong negative correlation between early fecundity and longevity for individuals within a clone. This is an outcome of determinate growth rather than an expression of reproductive cost. Despite the negative correlation of present with future reproduction commonly observed when different species are compared correlations between individuals within species are generally positive.) <KEYWORDS: Platylabus patulus, Aelosoma tenebrarum, Pristina aquiseta, Philodina sp., Cypridopsis vidua, Daphnia pulex, Growth, Survival, Rotifera, Oligochaeta, Ostracoda, Branchiopoda>

Bielanska-Grajner, I. 1984. Rotifers, Rotatoria, of lake Paprocanskie, Upper Silesia, Poland. Acta Hydrobiol 2526(1):67-80. <Address: Silesian Univ., Department of Ecology, ul. Bankowa 9, 40-007 Katowice, Poland.> <ABSTRACT: BIOSIS: 79-38965. From March-Nov. 1980 rotifers were studied in the highly eutrophic artificial Lake Paprocanskie in Upper Silesia. The investigation was carried out at 5 ecologically differentiated sampling stations. Rotatoria taxa (74) were determined, 1 of them new for Polish fauna and 6 rare. Macrophytes were found to influence the occurrence and number of rotifers. The species of Phragmites communis Trin. and Typha latifolia L. were the most frequent (61 and 48 taxa, respectively), although not numerous. The largest number of rotifers, but with few taxa (15), were found in the open water area.> <KEYWORDS: Phragmites communis, Typha latifolia, Macrophyte, Rotifera>

Benzie, J.A.H. 1984. Zooplankton of an Australian high alpine lake, Lake Cootapatamba, Kosciusko Range (Australia). Aust J Mar Freshwater Res 35(6):691-702. <Address: Department of Population Biology, Res. Sch. Biol. Sci., Aust. Natl. Univ., P.O. Box 475, Canberra City, A.C.T. 2601. AUSTRALIA> <ABSTRACT: BIOSIS: 79-48045. The zooplankton of Lake Cootapatamba, the highest (2070 m) alpine cirque lake in continental Australia, was sampled monthly during the ice-free periods of 1981 and 1982. Eleven taxa were identified, the zooplankton being dominated by Boeckella montana, B. pseudochelae, Daphnia nivalis, and in one month, Keratella slacki. Partial correlations with physicochemical parameters (pH, conductivity, O₂ and temperature) indicated no strong and consistent trends with zooplankton numbers. In addition to possible competitive effects between K. slacki and the crustaceans (marked by strong spatial and temporal segregation), circumstantial evidence is produced for a direct control by food on the major population changes in 1981 and 1982. (Other taxa found were Eucyclops ruttneri, Acanthocyclops sp., Canthocamptus australicus, C. longiseta, Diffugia sp., Piona sp. and unidentified ostracod juveniles.) <KEYWORDS: Boeckella montana, Boeckella pseudochelae, Daphnia nivalis, Keratella slacki, Eucyclops ruttneri, Acanthocyclops sp., Canthocamptus australicus, Canthocamptus longiseta, Diffugia sp., Piona sp., Ostracods, pH, Conductivity,

Oxygen, Temperature, Branchiopoda, Copepoda, Rotifera, Ostracoda, Coleoptera, Acarina.)

Boehlert, G.W., and Yoklavich, M.M. 1984. Carbon assimilation as a function of ingestion rate in larval Pacific herring, Clupea harengus pallasii. J Exp Mar Biol Ecol 79(3): 251-262. <Address: National Marine Fisheries Service Honolulu Lab., P.O. Box 3830, Honolulu, HI 98612, USA.> <ABSTRACT: BIOSIS: 78-82301. During the larval stage, clupeoids and other fishes are characterized by straight, relatively undifferentiated guts. Where it has been studied in detail, the evacuation rate in these larvae appears to be directly related to ingestion rate, which is in turn related to food concentration. Qualitative assessments have suggested that the degree of digestion of food particles is inversely related to the rate of evacuation. In the present study, early larvae of the Pacific herring, C. h. pallasii Valenciennes, were fed for 1 h upon ¹⁴C-labeled rotifers, Brachionus plicatilis Muller and Artemia nauplii at high densities. At the end of 1 h, larvae were transferred to 6 food densities, ranging from 0-10 unlabeled prey·ml⁻¹. After 22 h, larvae were removed from the feeding tanks and sacrificed. The labeled C remaining in the larvae as a function of the percent consumed after the 1-h feeding interval was used as an index of C assimilation. The percent C retained decreased significantly with increasing food concentration. Larval herring thus decrease C assimilation from individual food particles at high food densities. The magnitude of increasing ingestion, more than compensates for the decreased C assimilation, and larvae gain greater total energy under conditions of high food concentration. The results support the suggestion that clupeoid larvae are adapted to utilize high food concentrations associated with plankton patches in the pelagic environment.> <KEYWORDS: Brachionus plicatilis, Artemia, Osteichthyes, Branchiopoda, Rotifera>

Bogdan, K.G. and Gilbert, J.J. 1984. Body size and food size in freshwater zooplankton. Proc Natl Acad Sci USA 81(20):6427-6431. <Address: Dep. Biol. Sci., Dartmouth Coll., Hanover, N.H. 03755, USA> <ABSTRACT: BIOSIS: 79-66376. Double-label liquid scintillation techniques were used to measure the efficiencies with which 8 different-sized zooplankton species ingested 4 cell types relative to a standard cell type (Chlamydomonas). Efficiency ratios (ER: clearance rate on cell type X div. clearance rate on Chlamydomonas) on the 3 ultraplankton (< 5µm in diameter) cells (a coccoid bacterium and the algae Synechococcus and Nannochloris) varied greatly among zooplankton species but were not correlated with zooplankton body length. Variation in ER on a much larger (17 X 14µm) algal cell (Cryptomonas) was only partly explained by zooplankton body length. The 8 zooplankton species were classified into 3 functional groups: species having moderate to high ER on all ultraplankton (0.4 < ER < 1.6) and ER on Cryptomonas proportional to their body lengths (Conochilus, Diaphanosoma, and probably Keratella cochlearis and Ceriodaphnia); species having extremely low ER on bacteria (mean ER < 0.05), higher but still low ER on ultraphytoplankton (ER generally < 0.04), and ER on Cryptomonas

proportional to their body lengths (Bosmina, Diaptomus copepodites and adults); species having extreme low ER on all ultraplankton (mean ER < 0.05) and ER on Cryptomonas much higher than expected given their body lengths (K. crassa, Polyarthra and Diaptomus nauplii). These functional groups follow neither taxonomic nor body-length groupings. Zooplankton body length may influence the maximal particle size that a species can ingest but has little influence on the ingestion of smaller particles. Two frequently used models relating zooplankton body size and food size are unrealistic.) <KEYWORDS: Chlamydomonas, Synechococcus, Nannochloris, Cryptomonas, Conochilus, Diaphanosoma, Ceriodaphnia, Keratella cochlearis, Keratella crassa, Diaptomus, Bosmina, Polyarthra, Rotifera, Branchiopoda, Copepoda, Chlorophyta, Bacteria, Flagellata, Cyanophyta, Cryptophyta>

Boonsom, J. 1984. Zooplankton feeding in the fish Trichogaster pectoralis. Hydrobiologia 113(0):217-222. <Address: Natl. Inland Fisheries Inst., Bangkok, THAILAND.> <ABSTRACT: BIOSIS 28-15492; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Rotifer, Ciliate, Copepod, Cladocera, plant, Osteichthyes, Branchiopoda>

Boonsom, N. 1984. The freshwater zooplankton of Thailand, Rotifera and Crustacea. Hydrobiologia 113(0):223-230. <Address: Natl. Inland Fisheries Inst., Bangkok, THAILAND 10900.> <ABSTRACT: BIOSIS: 28-15493; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Rotifera, Crustacea>

Borgmann, U. and Ralph, K.M. 1984. Copper complex and toxicity of freshwater zooplankton. Arch Environ Contam Toxicol 13(4): 403-410. <Address: Dep. Fisheries Oceans, Canada Cent. Inland Water, Burlington, Ontario, L7R 4A6, CANADA > <ABSTRACT: BIOSIS: 78-96166. The effect of Cu on the growth rate of cyclopoid copepods and survival of rotifers was determined in natural water with and without addition of the complexing agent Tris. Free Cu concentrations were estimated, by cupric ion electrode and from bioassay data, making use of the known complexing ability of Tris and the increase in total Cu tolerated after Tris addition. Growth rates of copepods were directly related to free Cu concentrations indicating that the Cu-Tris complex was not toxic to these animals. Rotifer survival was similar at equivalent free Cu concentrations in water with and without 1 mmol Tris, but addition of 3 mmol Tris resulted in slightly lower free Cu at equivalently toxic total Cu concentrations. Free Cu concentrations calculated from bioassay data compared well with electrode measurements in all cases except when calculated using the 3 mmol Tris data for rotifers, when free Cu concentrations were slightly overestimated.> <KEYWORDS: Copepod, Rotifer, Metal pollution, Tris>

Chengalath, R., Bruce, W.J., Scruton, D.A. 1984. Rotifer and crustacean plankton communities of lake in insular Newfoundland. Verh. Internat. Verein. Limnol. 22:419-430. <Address: Invertebrate Zoology Division, National Museum of Natural Sciences, Ottawa, Ontario, K1A 0M8, CANADA> <ABSTRACT: The main purpose of this study was to determine the composition of the rotifer and crustacean plankton communities of lakes in insular Newfoundland. This will form a source of baseline information with which comparisons can be made and future changes measured. Newfoundland is a geologically diverse region of Canada (Douglas 1970) for which no such data exist. There are large gaps in our knowledge of the geographic distribution, environmental tolerance and basic ecology of planktonic organisms in Canadian lakes. There have been some studies of crustacean plankton communities in other regions of Canada [authors site these here - eds.] Information about the Rotifera is scarce from Canada except for a few sporadic studies [authors site these here - eds.] Only a few limited, localized studies of zooplankton communities have been carried out in the region covered by this study [authors site these here - eds.], and they are inadequate to characterize the zooplankton fauna for the various types of lakes found in Newfoundland. [31 different species if rotifers were found in 109 lakes. - eds]

Chuikov, Yu.S. and Stroganov, A.A. 1984. Interrelationship between some components of the planktonic community and the content of phosphates and oxygen in the water. Gidrobiol Zh 20(1):9-17. <Language: RUSSIAN> <Address: V.I. Lenin Astrakhan State Reserve, Astrakhan USSR.> <ABSTRACT: BIOSIS: 78-74218; Correlation dependences were studies between indices of zooplankton development and contents of phosphates and dissolved O₂ in water bodies subjected to a eutrophic effect of bird colonies in the Volga delta USSR. Estimates are given for the value and direction of relations between phosphate and O₂ concentrations in water, between these indices and zooplankton numbers and biomass as a whole, between numbers and biomass of rotifers, Copepoda, and Cladocera. Rotifera were not statistically correlated to phosphate levels.>

Collado, C., Fernando, C.H., and Sephton, D. 1984. The freshwater zooplankton of Central America and the Caribbean. HYDROBIOLOGIA 113(0):105-120. <Address: Dep. Biol., Univ. Waterloo, Waterloo, Ont., N2L 3G1 CANADA> <ABSTRACT: BIOSIS: 28-15480; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Rotifera, Cladocera, Calanoidea, Cyclopoida, Ostracoda, Daphnia, Branchiopoda>

Crawford, C.M. 1984. Preliminary results of experiments on the rearing of Tasmanian (Australia) flounders, Rhombosolea tapirina and Ammotretis rostratus. Aquaculture 42(1):75-82. <Address: Zoology Department, James Cook University, Townsville, Qld. 4811, AUSTRALIA.> <ABSTRACT: BIOSIS: 79-39228. Tasmanian species of flounder were cultured successfully following stripping and fertilizing eggs after hormone-induced ovulation. The larvae were fed rotifers followed by Artemia nauplii. Survival rates of larvae from 1st-feeding to metamorphosis, which were as high as 91-98% for

R. tapirina and 65% for A. rostratus, indicated that both species can be readily cultured in captivity.) <KEYWORDS: Artemia, Rotifer, Mortality, Aquaculture, Osteichthyes.>

D

Dabrowski, K. and Bardega, R. 1984. Mouth size and predicted food size preferences of larvae of 3 cyprinid fish species. *Aquaculture* 40(1): 41-46. <Address: Inst. Ichthyobiol. Fisheries, Acad. Agriculture Technol., 10-957 Olsztyn-Kortowo, POLAND.> Abstract: BIOSIS: 78-90547. Mouth size was examined in larvae and juvenile of 3 cyprinid fish species: grass carp (Ctenopharyngodon idella Val.), silver carp (Hypophthalmichthys molitrix Rich.) and bighead carp (Aristichthys nobilis Rich.). A linear relationship was found between mouth size and the total length of fish, from the initial exogenous feeding stage up to 20-30 mm. Based on the mouth size, the size of the prey which could be consumed was calculated assuming 45° of mouth opening for optimum prey width and 90° for maximum prey width. Food particle size considered to be suitable for commencement of feeding was 50-90µm for silver carp larvae, 90-150µm for grass carp larvae and 150-270µm for bighead carp larvae. These criteria can be applied to moving rotifers and nauplii as well as to the motionless particles of compound, dry diets.) <KEYWORDS: Rotifer, Nauplii, length, width, feeding, prey, diet, Osteichthyes, Branchiopoda.>

Dattagupta, A.K. 1984. Some aspects of induced sexuality, embryogenesis and synthesis of protein and nucleic acid in the rotifer Asplanchna brightwelli. *Uttar Pradesh J Zool* 4(1):1-9. <Address: Dep. Zool., Kurukshetra Univ., Kurukshetra-132 119, INDIA.> <ABSTRACT: BIOSIS: 79-59206. Results of studies on sexuality and associated responses to dietary tocopherol, embryogenesis and synthesis of protein and nucleic acids in the rotifer Asplanchna are presented. Labeled tocopherol fed to Fo mothers passes on to successive generations, though progressively less in amount, and induces mixis and body wall outgrowths (BWO) in the animals. Mixis and BWO responses bear a relationship with the concentration of tocopherol in the animal. Cleavage types are spiral and determinate, besides, there is the formation of the D-quadrant which gives rise to adult reproductive structures. Post-mitotic stages are concerned with differentiation and orientation of organ systems. Synthesis of DNA stops in the post-mitotic stage; protein synthesis is a continuous process; synthesis of RNA begins as early as 2 cell stage. Conserved informational RNA seem to control the synthesis of protein during the early embryonic stages of A. brightwelli.> <KEYWORDS: Tocopherol, Vitamin-E, Rotifera>

Dodson, S.I. 1984. Ecology and behavior of a free swimming tube dwelling rotifer Cephalodella forficula. *Freshwater Biology* 14(3):329-334. <Address: Department of Zoology, University of Wisconsin, Madison, WI, USA> <ABSTRACT: BIOSIS: 88-52261; Cephalodella forficula (Ploima, Rotifera) lives in tubes it constructs itself. These tubes are built of mucus in detritus-rich

environments. The tubes are often closed at both ends, are not used as sieves, and are not eaten directly. The rotifer swims back and forth in its tube and apparently lives on bacteria which are shed from the inner walls of the tubes. Because of surface-to-volume considerations, this feeding strategy is probably only possible for animals smaller than roughly 1mm. Under low food conditions, rotifers inside a tube have a distinctly higher fitness than rotifers removed from their tube. Given high food conditions, rotifers removed from a tube immediately build another. Grazing on particles outside the tube appears to take place when a tube is being lengthened. Rotifers do not leave the tube for routine feeding, but under conditions of starvation or very low O₂ concentration, they will leave the tube and swim about.)

Drenner, R.W., Taylor, S.B., Lazzaro, X., and Kettle, D. 1984. Particle-grazing and plankton community impact of an omnivorous cichlid (*Tilapia aurea*). Selected Papers from a Symposium on Fish as Primary Consumers, held at the 113th Annual Meeting of the American Fisheries Society, Milwaukee, Wis., USA, Aug. 17, 1983. TRANS AM FISH SOC 113(3):397-402. <Address: Biol. Dep., Texas Christian Univ., Fort Worth, TX 76129 USA> <ABSTRACT: BIOSIS: 28-17890.> <KEYWORDS: Keratella sp., Diaptomus sp., size selectivity, escape selectivity, ecological energetics, osteichthyes, Copepoda, Rotifera>

Duncan, A. 1984. Assessment of factors influencing the composition, body size and turnover rate of zooplankton in Parakrama Samudra, an irrigation reservoir in Sri Lanka. HYDROBIOLOGIA 113(0):201-216. <Address: Dep. Zool., Royal Holloway Coll., Englefield Green, Surrey TW20 9TY, UK> <ABSTRACT: BIOSIS: 28-15491; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Asplanchna brightwelli, Ehirava fluviatilis, Trichocerca spp., Filinia longisetata, Rotifer, temperature, food limitation, species-selective predation, size-selective predation, wash-out, Osteichthyes, Branchiopoda>

Duray, M. and Bagarinao, T. 1985. Weaning of hatchery-bred milkfish (*Chanos chanos*) larvae from live food to artificial diets. Aquaculture 41(4):325-332. <Address: Aquaculture Dep., Southeast Asian Fisheries Development Cent., Tigbauan, Iloilo, THE PHILIPPINES.> <ABSTRACT: BIOSIS: 79-39205. Two-wk-old milkfish larvae (7.5 mm standard length, 2.3 mg wet body wt) previously fed only rotifers were weaned abruptly to 6 artificial diets (commercial feed TP, artificial plankton AS and BP, experimental SEAFDEC diets CT and CB and moist egg diet) with control larvae fed Artemia nauplii. Survival rates ranged from 38% on moist egg diet to 63% on BP, with 42% in the control. On day 43, larvae attained mean lengths of 7.7 mm on moist egg diet to 13.4 mm on Artemia, with no significant differences between diets. The mean wet weights were highest in larvae fed Artemia (77.8 mg), significantly different from those attained on TP and CT, and these were significantly higher than those attained on BP, AS, CB and moist egg diet (the last with only 29.7 mg). Results showed the feasibility of weaning

(gradually) even younger milkfish larvae in hatcheries using artificial diets.) <KEYWORDS: Artemia, Rotifer, survival rate, length, Osteichthyes>

Dzhemileva, T. G. 1983. Zooplankton of Kopet-Dag reservoir (Turkmen SSR, USSR). Izv Akad Nauk Turkm SSR Ser Biol Nauk 0(6):38-44. <Address: Inst. Zool., Acad. Sci. Turkm. SSR, Ashkhabad, USSR.> <ABSTRACT: BIOSIS: 79-11471. According to observations for the hydrobiological regime of Kopet-Dag reservoir, seasonal changes of species composition, number and biomass of zooplankton are revealed. The enrichment of the species composition of zooplankton (Rotatoria, Cladocera, Copepoda) and increase of its quantitative development within the years of this reservoir's existence are determined. <KEYWORDS: Rotifera, Cladocera, Copepoda, species composition, biomass>

E

Emmerson, W.D. 1984. Predation and energetics of Penaeus indicus (Decapoda, Penaeidae) larvae feeding of Brachionus plicatilis and Artemia nauplii. Aquaculture 38(3):201-210. <Address: Department of Zoology, University of Transkei, Private Bag X5092, UMTATA.> <ABSTRACT: 88-50262; Brachionus plicatilis and Artemia nauplii were fed to a number of larval stages of the penaeid prawn Penaeus indicus to determine ingestion rates.>

Enesco, H.E. and Sawada, M. 1984. UV radiation and photoreactivation: Influence on rotifer (Asplanchna brightwelli) lifespan. 14th Annual Meeting of the American Aging Association, New York, N.Y., USA, Oct. 18-20, 1984. AGE (OMAHA) 7(4): 143. <Address: Dep. Biology, Concordia Univ., Montreal, Quebec H3G 1M8, CANADA.> <ABSTRACT: BIOSIS: 28-73186.> <KEYWORDS: DNA repair enzyme activation, Rotifera>

F

Forsyth, D.J., Downes, M.T., Gibbs, M.M., Kemp, L., McCallum, I., MacKenzie, L., and Payne, G. 1983. Aspects of the limnology of Lake Rotongaio, New Zealand. N Z J Mar Freshwater Res 17(4):423-436. <Address: Taupo Res Lab, Div Marine and Freshwater Sci, Department of Scientific and Industrial Res., PO Box 415, Taupo, NEW ZEALAND> <ABSTRACT: BIOSIS: 78-74303; Lake Rotongaio, a warm monomictic lake, was sampled at monthly intervals for 1-yr to investigate water temperature, transparency, chemistry, zooplankton, and benthic macroinvertebrates. The zooplankton comprised rotifers (57%, and 6 species), crustaceans (34%), and ciliates (9%).>

Francez, A.J. 1984. Écologie des peuplements de rotifères sessiles des lacs-Tourbières d'Auvergne (France). Bull. Écol. 15(4):231-237. <Language: FRENCH with ENGLISH abstract> <Address: Station Biologique de Besse-en-Chandesse, B.P. 45-63170 Aubière, FRANCE.> <ABSTRACT: Sessile rotifer communities of 9 substrates, were studied from June to October 1980 in 7 Auvergne. Sphagnum-bogs

(France), show various richnesses and heterogeneities. Higher diversity values were obtained for Utricularia vulgaris in the artificial laggs and for Potamogeton natans in the littoral zones of lakes. Almost half of the species colonize less than 3 substrates. Spatial niche overlap seem to be higher in artificial laggs. The individuals size for each species, increases with community diversity. Ptygura pilula shows significant variations of reproduction cost depending on which of two substrates colonization, Utricularia minor and U. vulgaris. The second part of this work considers the relationship between species and substrates. The different demographic responses of P. pilula are explained by predation. Some consideration of the spatial structure and the cenotic strategies are added.)

Francez, A.J. 1984. Rotifères sessiles observés en Auvergne. Bull. Natural. Parisiens. 40(3-4):73-80. <Language: FRENCH> <ABSTRACT: Au cours de l'année 1980, 16 espèces ou sous-espèces de Rotifères Sessiles ont été observées dans 7 tourbières ou lacs-tourbières d'Auvergne. L'auteur donne des précisions sur la taxonomie et la biologie de quelques espèces dont Floscularia janus, nouvelle pour la France. La distribution des espèces en fonction du substrat est analysée selon la méthode des polygones; des associations typiques liées aux végétaux de la zone littorale des lacs, aux Sphaignes et aux Utriculaires sont mises en évidence. Un dendrogramme de similitude entre les différents supports souligne l'influence de la complexité structurale du substrat sur la richesse spécifique.>

Fukusho, K. and Okauchi, M. 1984. Seasonal isolation between 2 strains of rotifer Brachionus plicatilis in an eel-culture pond. Bull Jpn Soc Sci Fish 50(5): 909. <Address: National Res. Inst. of Aquaculture, Nakatsuhama, Nansei, Mie 516-01, JAPAN> <BIOSIS: 27-71392> <KEYWORDS: aquaculture, Rotifera, Osteichthyes>

Fukusho, K., Okauchi, M., Nuraini, S., Tsujigado, A., and Watanabe, T. 1984. Food value of a rotifer Brachionus plicatilis, cultured with Tetraselmis tetrathele for larvae of red seabream Pagrus major. Bull Jpn Soc Sci Fish 50(8):1439-1444. <Address: National Res. Inst. Aquaculture, Nakatsuhama, Nansei, Mie 516-01, JAPAN.> <ABSTRACT: BIOSIS: 79-29803. A minute alga T. tetrathele is one of the food organisms which have been introduced into Japan recently. T. tetrathele was well evaluated already as a substitute for Chlorella because of the high food value for a rotifer B. plicatilis and its eurythermal characteristic in addition to high temperature tolerance. But, the dietary value of the rotifer cultured with T. tetrathele remains unknown. The dietary value of rotifers cultured with T. tetrathele (TR) or both T. tetrathele and Chlorella sp. (TCR) was compared with those cultured with Chlorella (CR) by feeding these various rotifers to larval red seabream for 17 days. Rotifers enriched by Chlorella (12-24 h) after culturing with T. tetrathele (TR-C) were also given to the larvae. The survival rate and the total length (T.L.) of fish fed TR were better than those receiving CR (75.6 and 83.5% vs. 65.1 and

75.6% in survival rate, 7.5 and 8.1 mm vs. 6.5 and 6.9 mm in average T.L.), although there were no significant differences in body weight. The survival rate and the growth of fish fed TCR or TR-C were superior to the former, i.e., 68.0-80.1% and 8.7-8.8 mm in TCR, 74.7-81.1% and 8.5-9.1 mm in TR-C. There were no differences in proximate composition of the rotifers with various feeds and treatment. The difference in survival rate and growth among the larvae with different feeds might be due to the difference in the content of omega.3 HUFA. The percentage of omega.3 HUFA in the lipids of TR, TCR, TR-C and CR were 12.4%, 20.9%, 20.4-25.4% and 23.9%, respectively. The amount of omega.3 HUFA in the rotifers cultured with T. tetrathele was not enough, but might be the minimum (0.3% in rotifer). The influence of 18:3 omega.3 included in the rotifer at high percentage (22.4%) should be studied in future works.) <KEYWORDS: Chlorella sp., larva, survival, body length, body weight, growth, lipid, temperature, Rotifera, Osteichthyes, Chlorophyta, Protozoa>

G

Gadkari, A.S., Paramasivam, R., and Gadkari, S.K. 1983. Observations of the flora and fauna of slow sand filters. Indian J Environ Health 25(4):241-260. <Address: National Environmental Eng., Research Institute, Nagpur-440 020, INDIA> <ABSTRACT: BIOSIS:78-79407; Observations were made over 2 years on the occurrence and distribution of biological forms in a slow sand filter pilot plant treating lake water and operated under different conditions. There was a dynamic population of micro- and macro-from, e.g., algae, protozoa, rotifers, oligochaetes, crustaceans, insect larvae, associated with slow sand filtration.>

Gates, M.A. and Lewg, U.T. 1984. Contribution of ciliated protozoa to the planktonic biomass in a series of Ontario Canada lakes: quantitative estimates and dynamical relationships. J Plankton Res 6(3):443-456. <Address: Department of Zoology, University of Toronto, 25 Harbord st., Toronto, Ontario, M5S 1A1, CANADA> <ABSTRACT: 78-50118; NB: the keyword rotifer is contained in the keyword field of this paper. The editors have not reviewed the paper specifically.>

Gatto, M and Ricci, C. 1984. Age structure and density dependence in the dynamics of a population of Philidina roseola. Atti 4° Simposio Dinamica Popolazioni (Parma 22-24 ottobre 1981):41-50. <Address: See Ricci below.> <ABSTRACT: The work is devoted to the analysis of the dynamics of a population of Philodina roseola by jointly utilizing life table data (102 individuals) and data from batch cultures (10 replicates) where the total numbers of individuals and eggs were counted. A multi-age-class model with density dependence satisfactorily explains the observed phenomena.>

Geddes, M.C. 1984. Seasonal studies on the zooplankton community of Lake Alexandrina, River Murray, South Australia, and the role of turbidity in determining zooplankton community structure. Aust J

Mar Freshwater Res 35(4):417-426. <Address: Dep. Zool., Univ. Adelaide, P.O. Box 498, Adelaide, SOUTH AUSTRALIA 5001.> <ABSTRACT: BIOSIS: 79-20361. Zooplankton was quantitatively collected from Lake Alexandrina from Nov. 1975 to March 1978. Twenty-eight species of zooplankton were identified, although momentary species composition usually comprised 2 calanoids, 1 cyclopoid, 3-6 cladocerans and 0-4 rotifers. There were no consistent patterns in the vertical or horizontal distribution of the major zooplankters. Some species, including Boeckella triarticulata, Calamoecia ampulla, Bosmina meridionalis, Ceriodaphnia quadrangula and possibly Daphnia carinata were perennial, whereas Diaphanosoma unguiculatum, Moina micrura and Daphnia lumholtzi were seasonal. Zooplankton density was relatively high and constant throughout the study. The zooplankton community included both large and small species. In Lake Alexandrina, high turbidity may preclude size-selective fish predation, allowing the persistence of large species, while invertebrate predation may be insufficient to remove small species.> <KEYWORDS: Bosmina meridionalis, Ceriodaphnia quadrangula, Daphnia carinata, Diaphanosoma unguiculatum, Moina micrura, Daphnia lumholtzi, calanoid, cyclopoid, Cladoceran, Rotifer, predation, Pisces>

Gilbert, J.J. and Stemberger, R.S. 1984. Asplanchna induced polymorphism in the rotifer Keratella slacki. Limnol Oceanogr 29(6):1309-1316. <Address: Dep. Biol. Sci., Dartmouth Coll., Hanover, New Hampshire 03755, USA> <ABSTRACT: BIOSIS: 79-66347. Asplanchna releases into its environment a filterable factor which induces eggs of K. slacki to develop into individuals with slightly larger (15%) bodies, considerably longer (30%) anterior spines, much longer (130%) right posterior spines and sometimes short, left posterior spines not otherwise present. The Asplanchna-induced morph is much less susceptible to Asplanchna predation than the noninduced morph, its long spines making it about 2 times less likely to be captured after being attacked and about 5 times less likely to be ingested after being captured. The pronounced asymmetry of the posterior spines may minimize the cost of spine production without sacrificing protection.> <KEYWORDS: Morphology, egg, predation, Rotifera>

Gophen, M. 1984. The impact of zooplankton status on the management of Lake Kinneret, Israel. Hydrobiologia 113(0):249-258. <Address: Kinneret Limnol. Lab., P.O. Box 345, Tiberias 14102, ISRAEL.> <ABSTRACT: BIOSIS: 28-15496; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Cladocera, Copepoda, Rotifera, predation, stocking, Osteichthyes, Branchiopoda, Copepoda>

Green, J. 1984. Zooplankton associations in the swamps of southern Sudan. Hydrobiologia 113(0): 93-98. <Address: (Zool. Dep., Westfield Coll., Hampstead, London NW3 7ST, UK> <ABSTRACT: BIOSIS: 28-15478; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Crustacea, diversity, Crustacea>

Gruner, H.-E. 1984. Lehrbuch der Speziellen Zoologie, Band 1. Wirbellose Tiere. 2. Teil: Cnidaria, Ctenophora, Mesozoa, Platyhelminthes, Nemertini, Entoprocta, Nemathelminthes, Priapulida. Textbook of Systematic Zoology, Vol. 1. Invertebrates: 2. Cnidaria, Ctenophora, Mesozoa, Platyhelminthes, Nemertini, Entoprocta, Nemathelminthes, Priapulida. 4th edition. In Gruner, H. (Ed.). Lehrbuch der Speziellen Zoologie, Band 1. Wirbellose Tiere. 2. Teil: Cnidaria, Ctenophora, Mesozoa, Plathelminthes, Nemertini, Entoprocta, Nemathelminthes, Priapulida (Textbook of Systematic Zoology, Vol. 1. Invertebrates: 2. Cnidaria, Ctenophora, Mesozoa, Plathelminthes, Nemertini, Entoprocta, Nemathelminthes, Priapulida). 4th Edition. 621p. 0(0): 621p. <ABSTRACT: BIOSIS: 28-12418.> <KEYWORDS: Cnidaria, Aschelminthes, Nematoda, Nematomorpha, Mesozoa, Ctenophora, Rotifera, Gastrotricha, Cestoda, Kinorhyncha, Acanthocephala, Rhynchocoela, Turbellaria, Trematoda, Phoronidea>

H

Hara, K., Arano, H., and Ishihara, T. 1984. Purification of alkaline protease of the rotifer Brachionus plicatilis. Bull Jpn Soc Sci Fish 50(9): 1605-1610. 1984. NSUGA <Address: Fac. Fish., Nagasaki Univ., Bunkyo, Nagasaki 852, JAPAN.> <ABSTRACT: BIOSIS: 79-59203. Alkaline proteases were isolated from the crude extract of the rotifer B. plicatilis by the combination of gel filtration and ion-exchange chromatography. Two-main active fractions, designated as F-I and F-II, were eluted on the 2nd DEAE-cellulose column, and F-I was finally purified about 190-fold and F-II about 920-fold. F-II was homogeneous as judged from polyacrylamide disc gel electrophoresis. The MW of F-I and F-II were estimated to be about 800,000 and 900,000, respectively, by Sepharose 6B gel filtration, and their isoelectric points were 9.7 and 5.6, respectively.> <KEYWORDS: gel filtration, ion exchange chromatography, cellulose column, gel electrophoresis, isoelectric point, Rotifera>

Hara, K., Arano, H., and Ishihara, T. 1984. Some enzymatic properties of alkaline proteases of the rotifer Brachionus plicatilis. Bull Jpn Soc Sci Fish 50(9): 1611-1616. 1984. NSUGA <Address: Fac. Fish., Nagasaki Univ., Bunkyo, Nagasaki 852, JAPAN.> <ABSTRACT: BIOSIS: 79-59202. Some enzymatic properties of alkaline proteases (F-I and F-II) were investigated. Optimum pH of F-I and F-II was 8-9, and maximum activities were obtained by incubating the enzymes at 37°C for 1 h. These enzymes were relatively stable over a range of pH 6-8, but markedly unstable above pH 11 and below pH 5.5. The enzymes were completely inactivated with HgCl₂, DFP, N-tosyl-L-phenylalanylchloromethane and soybean trypsin inhibitor. The action of F-II on insulin B-chain showed that the substrate specificity was similar to that of trypsin.> <KEYWORDS: substrate specificity, enzyme kinetics, pH, mercury chloride, insulin, DFP, trypsin, Rotifera>

Harvell, C.D. 1984. Predator induced defense in a marine Bryozoan. *Science* 224(4655):1357-1359. <Address: Friday Harbor Laboratory, Friday Harbor, Washington, 98250, USA.> <ABSTRACT: BIOSIS: 78-65974; Laboratory experiments showed that predation by both trophically specialized and generalized nudibranch species triggers rapid induction of defensive in the bryozoan Membranipora membranacea. Spines effectively control the pattern and extent of intracolony mortality caused by nudibranch predation. Previously found only in plants, rotifers, and cladocerans, consumer-induced defenses may be widespread among clone-forming or clonial taxa exposed to nonfatal encounters with predators.>

Higashihara, T., Fukuoka, S., Abe, T., Mizuhara, I., Imada, O., and Hirano, R. 1984. Culture of the rotifer Brachionus plicatilis using a microbial flock produced from alcohol fermentation slop. *Rep Ferment Res Inst (Yatabe)* 62(0):7-28. <Address: Clean Japan Cent., Toranomon, Minato-ku, Tokyo 105, JAPAN> <ABSTRACT: BIOSIS: 79-29821. The culturing of rotifer B. plicatilis using a microbial flock (AFS-Flock) as food produced from the alcohol fermentation slop (AFS) was examined with the aim of utilizing AFS. The AFS-Flock was an effective food for rotifer. When fed with the AFS-Flock, the rotifer density in the culture broth was maintained at > 200 individuals/ml for about 1 mo. Several strains of bacteria and yeasts were isolated from the AFS-Flock. Most isolated bacteria could not grow abundantly on the medium containng AFS as the sole source of C and energy. Most of the isolated yeasts assimilated AFS rapidly and abundantly. The results of culturing rotifer using cultural cells and broth of the isolated yeasts cultured wit AFS indicated that isolated yeasts were an effective food also. When the culture broth of most effective isolated yeast cultured with AFS was fed to the rotifer, the highest density of rotifer was 394 individualsml in 8 days of culture time. AFS-Flock is a possible new food for rotifer.> <KEYWORDS: bacteria, yeast, Rotifera>

Higashihara, T., Fukuoka, S., Abe, T., Mizuhara, I., Imada, O., and Hirano, R. 1984. The utilization of fermentation slop for aquaculture III: Culture of marine yeasts using alcohol fermentation slop and its taxonomic characteristics. *REP FERMENT RES INST (YATABE)* 62(0):29-42. <Address: Clean Japan Cent., Toranomon, Minato-ku, Tokyo 105, JAPAN> Abstract: BIOSIS: 79-39177. Marine yeasts isolated from microbial flocks produced from alcohol fermentation slop (AFS) were an effective food for the rotifer Brachionus plicatilis. Large scale cultures of 3 strains of the isolated yeasts, which are very effective as food, were carried out with a medium containing AFS as the sole source of C and energy using a 10 l jar fermentor. The yields of the isolated yeast cells from 1 l of culture broth were in the range of 15-24 g (dry cell weight). The dried yeast cells contained crude protein amounting to 33-38%. General compositions, amino acid and fatty acid compositions, and vitamin contents of the cells of the isolated yeasts cultured with AFS were compared with those of bakers' yeast. Except for crude ash there was no distinct difference between the isolated yeasts and bakers' yeast. Four representative strains of

the isolated yeasts were identified as Torulopsis inconspicua YU-1, Candida guilliermondii var. guilliermondii YA-3, C. krusei ZA-3 and C. valida KU-1, respectively. <KEYWORDS: Brachionus plicatilis, Torulopsis inconspicua, bakers yeast, protein, amino acid, fatty acid, vitamin, Rotifera, bacteria>

Hino, A. and Hirano, R. 1984. Relationship between body size of the rotifer Brachionus plicatilis and the minimum size of particles ingested. Bull Jpn Soc Sci Fish 50(7):1139-1144. <Address: Dep. Fish., Fac. Agric., Univ. Tokyo, Yayoi-1-1, Bunkyo, Tokyo 113, JAPAN> <ABSTRACT: BIOSIS: 79-22681. The minimum size of particles ingested by B. plicatilis was determined by the use of an automatic blood cell counter. Dividing the size distribution of baker's yeast into 12 sections (2.87-5.30 $\mu\text{m} \times \phi$), the minimum one among those sections where particle decreased as the result of ingestion was denoted as S_{min} . After calculating the ingestion rates (I_s) and (I), respectively, in S_{min} and the uppermost section where particles were large enough to be ingested by an individual, the percentage of rotifers which could ingest even S_{min} was presumed from the ratio (I_s/I). On the assumption that the smaller individuals can ingest the smaller particles, the one corresponding to (I_s/I)% on the ogive of rotifer size may have ingested the smallest particle whose diameter was the upper end of S_{min} . A regression line $Y = 0.010821X + 1.8958$ ($r = 0.61$) was obtained, where Y is the diameter of the smallest particle which can be ingested by the individual whose lorica length is $X \mu\text{m}$. The reason for the low correlation rate is explained by the result of the measurement of a masticatory organ. The size of jaw in the mastax, which may regulate the ability of mastication, is uniform irrespective of rotifer size. > <KEYWORDS: bakers yeast, mastax, torphi, Rotifera>

Hino, A. and Hirano, R. 1984. Relationship between water temperature and bisexual reproduction rate in the rotifer Brachionus plicatilis. BULL JPN SOC SCI FISH 50(9): 1481-1486. 1984. NSUGA <Address: Dep. Fish., Fac. Agric., Univ. Tokyo, Yayoi 1-1, Bunkyo, Tokyo 113, JAPAN> <ABSTRACT: BIOSIS: 79-59201: B. plicatilis was cultured individually and successively under 4 (15°, 20°, 25°, and 30°C) temperature conditions, and the frequency of mictic female production was examined. To avoid the density effect derived from accumulation of metabolites, culture medium was renewed at regular intervals proportionally to the metabolic rate which specific to each temperature. The hereditary differences in bisexual reproduction existing among strains could be considered negligible by experimenting on identical strains. Substrains (100) were made from the same stock, and cultured for 7-8 generations, picking up 5 offsprings in 1 generation-1 strain. Data from the initial 2 generations were rejected, because a temporary lowering of mictic female production was observed just after the transference into new environmental condition. Bisexual reproduction rate increases in lower temperatures below 25°C. There is no significant difference between 25° and 30°C groups. > <KEYWORDS: temperature, metabolism, metabolite, mictic female, Rotifera>

Hofmann, W. 1983. On temporal variation in the rotifer Keratella cochlearis: the question of Laterborn cycles. Hydrobiologia 101(3):247-254. <Address: Allgemeine Limnologie, Max Planck Institute Limnologie, Postfach 165, D, 2320 Ploen, FEDERAL REPUBLIC GERMANY> <ABSTRACT: BIOSIS 78-52266; The existence of separated forms within the population of Keratella cochlearis (Gosse) from lake Plussee was demonstrated on the basis of a biometric analysis. The morphs K. cochlearis, K. cochlearis var. hispida and K. cochlearis var. tecta were definitely not connected by transitional forms. K. cochlearis micracantha and K. tecta were not links of a K. cochlearis var. macracantha-micracantha-tecta series. The general validity of Laterborn cycles is questioned. The taxonomy of this species is also involved, because it is derived from the idea of phenotypic cycles in the sense of Laterborn.>

I

Ignat'eva, A.O. and Dokuchaeva, L.V. 1983. Pesticide residues in brackish ponds and their effect on zooplankton. Gidrobiol Zh 19(6): 58-60. <Address: Branch, All-Union Res. Inst. Pond Fish., Krasnodar, USSR.> <ABSTRACT: BIOSIS: 78-88075. The presence of pesticide residues in piscicultural ponds and their effect upon the composition of the natural food base of fish (zooplankton, in particular) were studied. A total of 337 toxicological samples and 63 zooplankton samples were taken in ponds of a Krasnodar Krai (Russian SFSR, USSR) fish-processing combine. The pesticides analyzed included organochlorine and organophosphorus compounds, as well as "rice" herbicides, propanide, yalan and Saturn. The maximal concentration of pesticides in the water was found in May-July, the period of their greatest utilization in agriculture. Regarding changes in the population and biomass of zooplankton, a comparison of data from the study of the zooplankton and from the study of the toxic substance content in the ponds showed that the latter had an effect on zooplankton population dynamics, in addition to the temperature factor, the water mineralization level and wind agitation. The pesticides exerted a negative effect upon the development of the zooplankton. Seasonal variations in the populations of rotifers, copepods, Moina rectirostris, Daphnia magna and Brachionus plicatilis were discussed in detail. Pesticides, in particular propanide and Saturn, were taken up by the zooplankton and transmitted to fish through the food chain.> <KEYWORDS: Moina rectirostris, fish, Daphnia magna, Brachionus plicatilis, Rotifer, Copepod, food chain, organochlorine compound, organophosphorus compound, rice herbicide, development, propanide, population, biomass, toxic substance, seasonality, temperature>

Infante, A. and Riehl, W. 1984. The effect of Cyanophyta upon zooplankton in a eutrophic tropical lake, Lake Valencia, Venezuela. Hydrobiologia 113(0):293-298. <Address: (Escuela de Biología, Univ. Central, Apartado 47106, Los Chaguaramos, Caracas, 1041, VENEZUELA.> <ABSTRACT: BIOSIS: 28-15498; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Microcystis aeruginosa, Lyngbya limnetica, Copepod, Cladoceran, Rotifer,

interference)

J

K

Kanazawa, A., Teshima, S.-I., Kobayashi, T., Iwashita, T., and Kawasaki, M. 1983. Rearing of the larval crab, Portunus trituberculatus, with the artificial microparticulate diets. Mem Fac Fish Kagoshima Univ 32(0): 121-128. <Address: Lab. of Fisheries Chem., Fac. of Fisheries, Univ. of Kagoshima, 4-50-20 Shimoarata, Kagoshima 890, JAPAN> <ABSTRACT: BIOSIS: 78-90543. Attempts to rear the larval crab, P. trituberculatus, with the artificial microparticulate diets, nylon-protein microencapsulated diet (MED), gelatin-arabic gum-MED, cholesterol-lecithin micro-coated diet (MCD) and carrageenan microbanded diet (MBD), were conducted. In experiment I, the feeding rate of the rotifers in the practical seed production of the crab was reduced by half and replaced with one of the above artificial diets during the period of zoea2-zoea4 stages. The larval crabs receiving every artificial diet along with the rotifers by the above mentioned manner had 11-20% survival comparable to the survival rate of the control group receiving the live feeds such as the rotifer, Artemia nauplii, and the minced meat of a short-necked clam. In experiment II, the larval crab was reared with one of the artificial diets alone after hatching. Every artificial diet sustained growth of the larval crab from zoeal to juvenile stages, although the survival rates of the crab receiving the artificial diets were lower than that of the crab receiving the live feeds (control group). The results of the present study thus show the success in rearing the larval crab with the artificial microparticulate diets.> <KEYWORDS: Artemia nauplii, Rotifer, short-necked clam, microencapsulated diet, diet, survival, malacostraca, branchiopoda, Pelecypoda>

Kankaala, P. 1984. A quantitative comparison of 2 zooplankton sampling methods, a plankton trap and a towed net, in the Baltic. Int Rev Gesamten Hydrobiol 69(2):277-287. <Address: Dep. Zool., Univ. Stockholm, S-106 91 Stockholm, SWEDEN> <ABSTRACT: BIOSIS: 79-2001. A comparison between a large plankton trap with a capacity of 23 l and a modern towed net was made in the course of zooplankton production studies in the Baltic. On the average, the net efficiency was 75% of that of the trap. Both methods were equally efficient in catching naupliar stages of copepods. The net efficiency was especially low during the zooplankton maximum for adult copepods and cladocerans (41 and 51%, respectively), probably due to the active avoidance of the net by fast swimming species. The net was only about 66% as efficient as the trap for catching rotifers. This difference is probably caused by the loss of small and softbodied forms through the mesh. Only about 65% of the total zooplankton biomass retained in the trap was collected by the net. Net sampling is not recommended for quantitative zooplankton studies.> <KEYWORDS: Copepod, Cladoceran, Rotifer, avoidance, naupliar stage, adult>

Khan, M.A. and Ejike, C. 1984. On invertebrate fauna of Benue and Plateau waters 1. Preliminary checklist of zooplankton. Jpn J Limnol 45(1):79-80. <Address see below> < Abstract: 27 43521> <KEYWORDS: Rotifer, Cladoceran, Copepoda, habitat, limnology, brachiopoda, invertebrate.>

Khan, M.A. and Ejike, C. 1984. Limnology and plankton periodicity of Jos Plateau water reservoir, Nigeria, West Africa. Hydrobiologia 114(3):189-200. <Address: Department of Botany, University of Jos, PMB 2084 Jos, NIGERIA.> <ABSTRACT: BIOSIS: 79-20409. Limnological data (Dec. 1980 to Jan. 1982) on the plankton and water chemistry of Lamingo Dam, located within the Jos biotite granite area of the Plateau State (Nigeria) are presented. The water-body falls in Beadle's (1981) category I of African lakes (conductivity < 40 μ S cm^{-1}). Alkalinity (.hivin.x = 0.3 meq l^{-1}), principally composed of bicarbonates, dominated the anions (HCO_3^- > Cl^- > SO_4^{2-}). The plankton were characterized by a moderate standing crop of phytoplankton, and zooplankton were, generally, very limited in species and abundance. The order of dominance for the categories of phyto and zooplankton was: (Bacillariophyceae > Chlorophyceae > Dinophyceae) and (Rotifera > Crustacea), respectively. A diel cycle was characterized by nocturnal upward migration of the zooplankton and the reverse behavior in the phytoplankton. Interrelations between the biotic assemblages of plankters and various physical and chemical variables are discussed.> <KEYWORDS: Rotifera, Crustacea>

Koste, W. und Poltz, J. 1984. über die Rädertiere (Rotatoria, Phylum Aschelminthes) des Dümmers, NW-Deutschland. Osnabrücker naturwiss. Mitt. 11:91-125. <Address: Ludwig-Brill Straße, D-4570 Quakenbrück, FEDERAL REPUBLIC of GERMANY> <ABSTRACT: Vom 3.11.1982 bis 17.Juli 1984 wurden in mehrwöchigen Abständen aus dem Litoral am NW-Ufer und Ostufer und in vier Freiwasserbereichen des Dümmers 11 Probenserien entnommen und auf ihren Rotatorienbestand hin geprüft. Es wurden insgesamt 95 Rädertier-Species gefunden. Das Untersuchungsergebnis wurde mit den von Perner-Manegold (1952) vorgelegten Listen, die insgesamt 32 Arten enthielten, verglichen. Davon konnten nur noch 25 aufgefunden werden. Bei den vermißten Rädertieren handelt es sich Organismen, die Ansprüche an ein xeno- bis oligosaprobies Milieu stellen (Notholca foliacea, Ploesoma truncata, Conochilus hippocrepis, Euchlanis triquetra, Platytas quadricornis, Keratella testudo, Polyarthra minor). Die 70 neuen Rotatorien leben meist in den Dekompositionszonen über abgestorbenen Makrophyten, aber auch in Periphyton der im See nach der Eindeichung noch erhaltenen submersen Pflanzenwelt, u.a. Scirpus lacustris-Horste, Nymphaea alba- und Nuphar luteum-Bestände. Synchron mit den Probenentnahmen wurden einige abiotische ökologische Daten gemessen, die auch bei den Einzelbesprechungen von 14 species zur Beschreibung ihrer ökologischen Ansprüche Verwendung finden. Die Extreme im Jahresgang für Sauerstoff: 2.4 mg/l (Juli 1983) und 28.5 mg.l (Juni 1984); für die Wassertemperatur: 1°C (Januar, februar, März 1984) und 28°C (Juli 1983).>

Kuczynski, D. 1984. Zooplankton, especially Rotifera, of the Reconquista River, Buenos Aires Province Argentina. Physis Secc B Aguas Cont Org 42(102):1-7. <Address: Facultad De Ciencias Exactas Naturales, Univ de Moron, Cabildo 134, 1708 Moron, ARGENTINA> <ABSTRACT: BIOSIS: 78-76374; The comparison among different parts of the river shows that there is no qualitative variation in the zooplanktonic Rotifera, Copepoda, and Cladocera. The following new records of rotifer species were found, Brachionus spp., Platyas quadricornis, Keratella spp., Euchlanis sp., Notholca acuminata, Lecane sp., Monostyla sp., Lepadella sp., Trichocerca sp., Monommata sp., Cephalodella sp., Synchaeta pectinata, Polyarthra vulgaris, Asplanchna brightwelli, Testudinella patina, Pompholyx complanata, and Filinia terminalis. The zooplankton is characteristic of alkaline waters.>

L

Lanestedt, G. 1984. Effect of young roach Rutilus rutilus on the zooplankton community in the eutrophic Lake Arungen, south-east Norway. Fauna (Oslo) 37(2):63-69. 1984. <Address: P.O. Box 154, N-1432 As-NLH.> <ABSTRACT: BIOSIS: 79-11483. The zooplankton community in the eutrophic Lake Arungen was investigated through the 1983 summer with reference to the effect on the structure of the community of predation from 1 yr old roach as a selective planktivore. This was done by measuring the community development in several containers with different fish densities. The total biomass of the zooplankton was suppressed by heavy predation. Neither rotifers nor copepods were influenced by the level of fish predation. The abundance of larger cladocerans, i.e., Daphnia hyalina, showed a significant negative correlation with the predation pressure: the opposite was true (i.e. positive correlation) for Bosmina longirostris, a much smaller representative of the cladocerans. This pointed out the effect of the planktivorous size-selective feeding and the competitive relationship between different cladoceran species. Another cladoceran in the samples, Ceriodaphnia reticulata (of intermediate size), showed no dependence on the predation level. For the larger zooplankton species, the average body length decreased when predation increased. This was especially true for D. hyalina, having a reduction in average body length from 1.37-1.14 mm. This was assumed to be caused by size-selective predation by roach and a strategic (avoid-predation) plasticity in average body length for those species. For smaller species, such as Bosmina spp., predation had no influence upon body size, although Bosmina were possible food items for young roach (i.e. larger than the average gill raker space.) <KEYWORDS: Daphnia hyalina, Bosmina spp., Bosmina longirostris, Ceriodaphnia reticulata, Cladoceran, Rotifer, Copepod, predation, planktivore, biomass, size-selective, gill raker>

Leetham, J.L., Lauenroth, W.K., Milchunas, D.G., Kirchner, T., and Yorks, T.P. 1984. Responses of heterotrophs. Pages 137-160, In Lauenroth, W. K. and E. M. Preston (Eds.). Ecological Studies, No. 45. The effects of SO₂ on a grassland: A case study in the

Northern Great Plains of the United States. xvi+207p. <Address: Natural Res. Ecol. Lab., Colorado State Univ., Fort Collins, Colo., USA.> <ABSTRACT: BIOSIS: 28-3294.> <KEYWORDS: Tardigrades, Rotifera, Nematodea, Arthropoda, sulfur dioxide>

Levine, D.M. and Sulkin, S.D. 1984. Nutritional significance of long-chain polyunsaturated fatty acids to the zoeal development of the brachyuran crab, Eurypanopeus depressus. J Exp Mar Biol Ecol 81(3):211-224. <Address: Department of Biochemistry, S.U.N.Y. at Stony Brook, Stony Brook, N.Y. 11794, USA.> <ABSTRACT: BIOSIS: 79-68488. Larvae of the mud crab E. depressus (Smith) showed higher survival and faster development rate from hatching to the megalopa stage when fed a diet of brine shrimp nauplii than when fed rotifers. When the rotifer diet was supplemented with the lipid-free fraction of brine shrimp in encapsulated form, larval growth was not enhanced. When only the lipid fraction of brine shrimp was added in encapsulated form to the rotifer diet, larvae showed enhanced survival and development to the megalopa as compared to rotifer-fed controls. When the rotifer diet was supplemented with microcapsules containing specific polyunsaturated fatty acid, enhanced larval survival and development rate resulted. The greatest effect was achieved on docosahexaenoic acid (22:6/omega/3). Long-chain polyunsaturated fatty acids, especially 20:5/omega/3 and 22:6/omega/3, are significant in promoting successful development to the megalopa.> <KEYWORDS: brine shrimp nauplii, Rotifer>

Lewis, M.A. 1984. Summer plankton dynamics in action Lake Ohio, USA. Ohio J Sci 84(3):103-112. <Address: Environmental Safety Department, Procter and Gamble Co., Cincinnati, Ohio, 45217, USA> <ABSTRACT: BIOSIS: 78-66075. Plankton was quantitatively sampled from Action Lake July-Sept. 1982. Species (82) of plankton and 18 species of zooplankton were identified. Species of Cyanophyta dominated the phytoplankton and overall the most abundant species during the study was the blue-green alga Schizothrix calcicola. Rotifers dominated the zooplankton. The diversity index, species number and density of phytoplankton progressively increased; the same parameters for zooplankton were highest in August.>

Lubzens, E., Sagie, G., Minkoff, G., Meragelman, E., and Schneller, A. 1984 Rotifers, Brachionus plicatilis, improve growth rate of carp, Cyprinus carpio, larvae. Bamidgeh 36(2): 41-46. <Address: Dep. Biol., Technion, Haifa, ISRAEL> <ABSTRACT: BIOSIS: 78-90588. Larval C. carpio raised on a mixed diet of artificial food and B. plicatilis grew 3 times faster than those fed on artificial food alone. Best development was obtained by feeding larvae on a combination of artificial food and rotifers supplied at a density of 5·ml⁻¹. Increasing rotifer density to 20·ml⁻¹ reduced larval growth rate in the presence or absence of artificial food. The euryhaline B. plicatilis, widely used in mariculture, can be successfully used also in freshwater aquaculture. Adding rotifers to carp larvae diet enhanced growth, permitting either a higher turnover of carp larvae production in the hatchery or the introduction of larger larvae into outdoor fish ponds.> <KEYWORDS:

hatchery turnover, euryhaline, growth, artificial food, aquaculture, Rotifera, Osteichthyes)

M

Maibam, S.S. and Dattagupta, A.K. 1983. Sexual and reproduction in a fresh water rotifer Asplanchna brightwelli. Uttar Pradesh J Zool 3(2):81-90. <Address: Department of Zoology, D.M. Coll. Imphal-795 001 > <ABSTRACT: BIOSIS: 78-67990; Sexuality and reproduction in the rotifer Asplanchna brightwelli were studied in laboratory and natural populations. In the laboratory in the absence of any known mixis inducing factor, A. brightwelli reproduced parthenogenetically for 6-8 months followed by sexual reproduction, in course of which the animal is capable of completing over 200 generations. In a natural pond A. brightwelli reproduced parthenogenetically from April/May - Dec/Jan followed by mictic production. The amictic and the mictic females were of a saccate morphotype. Sexual reproduction is preceded by production of a large number of offspring in both laboratory and natural populations.>

Mallin, M.A. 1984. The plankton community of an acid blackwater South Carolina (USA) power plant impoundment. Hydrobiologia 112(3): 167-178. <ADDRESS: Carolina Power and Light Co., Harris Energy Environmental Center, Route 1, Box 327, New Hill, NC 27562, USA.> <ABSTRACT: BIOSIS: 78-82323. Robinson Impoundment, an acid blackwater system in the South Carolina sandhills, serves as a cooling pond for an 854 MW power plant. It is divided by a causeway into an upper and lower impoundment. The upper impoundment is narrow, shallow, exhibits higher flow, and much more periphytic and rooted aquatic macrophyte vegetation. The lower impoundment is wide and deep with many sandy shoreline areas and little macrophyte vegetation. The zooplankton and phytoplankton communities of both the lower and upper impoundment were investigated over a 3 yr period (1980-1982) in an effort to determine power plant discharge effects on the plankton. Primary productivity rates were low, characteristic of an oligotrophic system. The phytoplankton community was dominated by the Bacillariophyceae and Chlorophyceae in cell density, and the Chlorophyceae in species richness. The zooplankton community was dominated numerically by copepods, rotifers and cladocerans, respectively. Principal zooplankton species included Diaptomus mississippiensis, Bosmina longirostris, Diaphanosoma brachyurum, Keratella americana, K. cochlearis, Pompholyx sulcata and Conochiloides coenobasis. The rotifers were dominant in species richness, while crustacean zooplankton species richness was usually quite low. Statistical analyses performed using phytoplankton and zooplankton population variables indicated that in most cases upper impoundment densities were significantly lower ($P < 0.05$) than lower impoundment densities which were likely a function of the lotic upper impoundment habitat. No significant differences were found between the discharge area and the rest of the lower impoundment stations, suggesting that localized power plant discharge effects did not occur during the study. Peak

midsummer thermal discharge (36.0°C) may have caused temporary reductions in D. mississippiensis and several rotifers. Thermal stimulation during summer may have caused population increases for the filter-feeding cladocerans, B. longirostris and D. brachyurum.
 <KEYWORDS: Diaptomus mississippiensis, Bosmina longirostris, Diaphanosoma brachyurum, Keratella americana, Keratella cochlearis, Pompholyx sulcata, Conochiloides coenobasis, zooplankton, phytoplankton, macrophyte, thermal effect, primary productivity, Copepoda, Branchiopoda, Rotifera>

Margaritora, F.G., Crosetti, D., Gigli, M., and Lombardi, F. 1984. 1st Observations on the structure and distribution of the biocenosis of a Karstic Lake: Lake Percile, Latium, Italy. Riv. Idrobiol. 20(3): 673-688. <Address: Istituto di Zoologia dell'Universita di Roma.>
 <ABSTRACT: BIOSIS: 79-20353. Results of a preliminary survey on the composition and distribution of the biocoenosis of Lake Percile (Latium, Italy) are reported. The study, started in Nov., 1979, was carried out with monthly samplings until June, 1981. This small karstic lake, 16 m deep, is located in an uninhabited area. The lake shows typical belts of emergent and submerged vegetation. The samplings revealed the presence of a scanty phytoplankton and of a zooplankton with 26 spp. of rotifers, cladocerans and copepods, with populations at low density, with the exception of rotifers. The littoral benthic biocoenosis is qualitatively and quantitatively abundant: 52 spp. were determined. The profundal benthos is represented by few species; the only species found at the maximum depth is Chaoborus flavicans. The lake is at present in good condition. Some symptoms of a change in its trophic conditions can be observed.> <KEYWORDS: Chaoborus flavicans, Rotifer, Cladoceran, Copepod, Phytoplankton, Zooplankton, vegetation, karstic lake, Diptera>

McCauley, E. 1984. The estimation of the abundance and biomass of zooplankton in samples. pages 228-265 In Downing, J. A. and F. H. Rigler (Eds.). IBP (International Biological Programme) Handbook, No. 17. A manual on methods for the assessment of secondary productivity in fresh waters, 2nd edition. xxiv+501p. <Address: Dep. Biol. Sci., Univ. Calif., Santa Barbara, Calif. 93106, USA.> <ABSTRACT: BIOSIS: 28-3217.> <KEYWORDS: Crustacean, Rotifer, Protozoa, ecological energetics, dry weight, length, accuracy, precision, carbon content, Protozoa>

N

Negi, V. and Pant, M.C. 1983. Analysis of zooplankton community of Lake Khurpatal (India), Kumaun Himalaya. Trop Ecol 24(2): 271-282. <Address: Dep. of Zool., D.S.B.C.C. Kumaun Univ., Naini, Tal-263002, INDIA> <ABSTRACT: BIOSIS: 78-90322. The species, composition, total abundance, temporal bordering of dominant taxa, vertical stratification and interrelationship of zooplankton and phytoplankton biomass in Lake Khurpatal were analyzed. Among 13 spp. of zooplankton, Mesocyclops leuckarti, Daphnia similis and Anuraeopsis fissa were the only dominant species in number of

individuals or biomass or both. Copepods tended to be segregated in the upper water strata, other zooplankters remaining concentrated in the deep waters. Community analysis showed 3 distinct communities during the year. The diversity of zooplankton was reduced due to dominance of a few zooplankters and to the available food resource, i.e., dinoflagellates which are not preferred by herbivores in Lake Khurpatal. The high phytoplankton: zooplankton biomass ratio (6.7) suggested that the resource partitioning by herbivores was not efficient, with a major portion of primary production remaining unutilized. Carnivory was more efficient than herbivory.)

<KEYWORDS: Mesocyclops leuckarti, Daphnia similis, Anuraeopsis fissa, Copepod, Dinoflagellate, phytoplankton, biomass, herbivore, resource partitioning, primary production, carnivore, branchiopoda, copepoda, algae, Rotifera>

0

Ohtaka, A. and Morino, H. 1984. The composition and the seasonal changes of the phytal animals in the Potamogeton malaianus region in lake Kitaura (Japan). Zool Sci (Tokyo) 1(6):998. 55th Annual Meeting of the Zoological Society of Japan, Morioka, Japan, Sept. 27-29, 1984. <Address: Zool. Inst., Fac. of Sci., Hokkaido Univ., Sapporo.> <ABSTRACT: BIOSIS 28-91341> <KEYWORDS: Nematode, Oligochaete, Protozoa, Rotifer, Turbellaria, Algae, abundance>

Okauchi, M. and Fukusho, K. 1984. Environmental conditions and medium required for mass culture of a minute alga, Tetraselmis tetrathele, Prasinophyceae. Bull Natl Res Inst Aquacult 0(5):1-12. <Address: Natl. Res. Inst. Aquaculture, Tamaki, Mie 519-04, JAPAN.> <ABSTRACT: BIOSIS: 79-11912. Chlorella is one of common feeds for mass culture of the rotifer Brachionus plicatilis in Japan, but the density of Chlorella tends to decrease especially in summer when water temperature becomes apprx. 30°C. Chlorella or other minute alga with tolerance to high temperature is required. T. tetrathele is one of minute algae which are used in southeast Asian countries where water temperature is in a range of 25°-35°C throughout the year; it seemed to be cultured instead of Chlorella in Japan. Optimum environmental conditions (temperature, light intensity, salinity and pH) and suitable medium for culturing T. tetrathele were examined in this study. T. tetrathele is a green unicellular alga with the 4 distinct flagella which are almost equal in length, and easily come off the cell (length: 9.8-15.3 µm, width: 6.0-10.5 µm, thickness: 4.3-8.5 µm). The cell volume (320 µm³) is 20-30 times larger than that of Chlorella. T. tetrathele showed favorable growth with several fertilizing methods being used for mass culture of Chlorella. T. tetrathele was ascertained to be a eurythermal organism, and was tolerant to a wide range of environmental temperature (5°-33°C). T. tetrathele could multiply even under low illumination (150 lx), but their growth rate was positively correlated to an increase in light intensity up to 3700 lux. T. tetrathele was a euryhaline organism, and multiplied under the salinity of 10-34.7 parts per thousand. Tolerable pH was 5-10. In case of the outdoor cultures using a 100

1 tank, T. tetrathele multiplied up to the density of 35×10^4 cells·ml (equivalent to 7×10^6 to approximately 1.05×10^7 cells of Chlorella) in summer and 6×10^4 cells·ml in winter. T. tetrathele can substitute Chlorella for the rotifer culture, especially during summer season. > (KEYWORDS: Chlorella, Brachionus plicatilis, temperature, light intensity, salinity, pH, growth rate, fertilization, Rotifera)

Okauchi, M. and Fukusho, K. 1984. Food value of minute alga, Tetraselmis tetrathele, for the rotifer Brachionus plicatilis culture: 1. Population growth with batch culture. Bull Natl Res Inst Aquacult 0(5): 13-18. <Address: Natl. Res. Inst. Aquaculture, Tamaki, Mie 519-04, JAPAN.> <ABSTRACT: BIOSIS: 78-90550; Food value of minute alga, T. tetrathele (Prasinophyceae) on population growth and polymorphism in size of rotifer B. plicatilis was investigated. The rotifers were precultured by feeding the marine Chlorella sp. or T. tetrathele for 30 days or 50 days, respectively. The precultured rotifers were divided into 2 groups and cultured in 500 ml beakers for 10 days with T. tetrathele or Chlorella sp. (inoculation density, 20 or 50 individuals/ml). Each alga was fed daily at the feeding density of 5×10^5 cells·ml for T. tetrathele, and, 15×10^5 cells·ml for Chlorella sp. The density of rotifers was counted once a day and population growth rate was calculated. Lorica length and width (maximum and minimum) were measured on 30 amictic female rotifers with eggs. The rotifers fed on T. tetrathele showed superior population growth rate of 0.24-0.49 to those of 0.16-0.47 observed on the rotifers fed on Chlorella sp. By feeding T. tetrathele rotifers became larger in size than those fed on Chlorella sp. resulting in 12.9% increase in lorica length (249.2 μ m). The minute alga T. tetrathele was a high quality food for rotifer culture.> (KEYWORDS: Chlorella sp., inoculation density, lorica, amictic female, egg, size, Rotifera, Chlorophyta)

Oladimeji, A.A. and Wade, J.W. 1984. Effects of effluents from a sewage treatment plant on aquatic organisms. Water Air Soil Pollut 23(3):309-316. <Address: Department of Biological Sciences, Ahmadu Bello University, Zaria, NIGERIA.> <ABSTRACT: BIOSIS: 79-27053. The effects of sewage pollution on the distribution and abundance of some organisms over 4 mo. at the Ahmadu Bello University Main Campus sewage treatment plant and Kubanni River (Nigeria) were studied. Physicochemical parameters such as dissolved O_2 , temperature, H^+ concentration (pH), electrical conductivity and chemical O_2 demand influenced by pollution were measured with respect to the population of aquatic organisms. The organisms were used as biological indices to monitor the ecological imbalance caused by the effluent. The variations in concentrations of some heavy metals were also measured. At the source of pollution there were no organisms except for some insect larva (Eristalis, Psychoda) and some microscopic algae (Oscillatoria, Anabaena and Polycystis). A location on the Kubanni River just before the confluence of the sewage effluent and the river was taken as the control. There was a wide variety of organisms (crustaceans, rotifers and fish) at the

control point.) <KEYWORDS: Eristalis sp., Psychoda sp., Oscillatoria sp., Anabaena sp., Polycystis sp., Crustacean, Rotifer, fish>

Opuszyński, K., Shireman, J.V., Aldridge, F.J., and Rottmann, R.W. 1984. Environmental manipulation to stimulate rotifers in fish rearing ponds. *Aquaculture* 42(34):343-348. <Address: Inland Fish. Isnt., Zabieniec, 05-500 Piaseczno, Pol.> <ABSTRACT: BIOSIS: 79-75739. Four treatments were established in 8 small ponds not stocked with fish: a control group (untreated and not fertilized) and 3 groups treated with organophosphate insecticide (Dylox). One group of Dylox treatment ponds was treated with chemical fertilizer, the 2nd group with chemical and organic fertilizer and the 3rd group with chemical-organic fertilizer and paddlewheel water agitation. Water analysis and zooplankton samples were collected twice weekly. Rotifers increased in numbers in all treated ponds but no correlations were found between 16 hydrochemical and biological parameters and rotifer numbers. The application of rotifer management techniques for rearing larval fish was discussed.> <KEYWORDS: larval fish, Rotifera>

Orcutt, J.D., JR. and Pace, M.L. 1984. Seasonal dynamics of rotifer and crustacean zooplankton populations in a eutrophic, monomictic lake with a note on rotifer sampling techniques. *Hydrobiologia* 119(1):73-80. <Address: Harbor Branch Foundation Inc., R.R. 1, Box 196, Fort Pierce, Florida 33450, USA.> <ABSTRACT: BIOSIS: 79-75543. The abundances, biomass and seasonal succession of rotifer and crustacean zooplankton were examined in a man-made, eutrophic lake, Lake Oglethorpe (Georgia, USA) over a 13 mo. period. There was an inverse correlation between the abundance of rotifers and crustaceans. Rotifers were most abundant and dominated (> 69%) the rotifer-crustacean biomass during summer months (June-Sept.) while crustacean zooplankton dominated during the remainder of the year (> 89%). Peak biomasses of crustaceans were observed in the fall (151 $\mu\text{g dry wt l}^{-1}$ in Oct.) and spring (89.66 $\mu\text{g dry wt l}^{-1}$ in May). Mean annual biomass levels were 46.99 $\mu\text{g dry wt l}^{-1}$ for crustaceans and 19.26 $\mu\text{g dry wt l}^{-1}$ for rotifers. Trichocerca rousseleti, Polyarthra sp., Keratella cochlearis and Kellicottia bostoniensis were the most abundant rotifers in the lake. Diaptomus siciloides and Daphnia parvula were the most abundant crustaceans. Lake Oglethorpe is distinct in having an unusually high abundance of rotifers (range 217-7980 l^{-1}). These high densities can be attributed not only to the eutrophic conditions of the lake but also to the detailed sampling methods employed in this study.> <KEYWORDS: Trichocerca rousseleti, Polyarthra sp., Keratella cochlearis, Kellicottia bostoniensis, Diaptomus siciloides, Daphnia parvula, biomass, rotifera, Copepoda, Branchiopoda>

AP*

- Paggi, J.C. and de Paggi, S.B.J. 1973. Sobre Algunos Rotiferos nuevos para la fauna Argentina. Rev. Asoc. Cien. Nat. Lit 0(4):49-60. <Address: see below> <ABSTRACT: En est trabajo se citan nueve especies y un género de Rotiferos nuevos para la fauna de agua dulce la República Argentina: Keratella serrulata, Epiphanes clavulata, Ascomorpha ecaudis, Ploesoma truncatum, Ploesoma lenticulare, Filinia opoliensis, Conochilus natans, Conochilus coenobasis.>
- de Paggi, S.B.J. 1979. Contribution al Conocimento de la fauna Argentina de Rotiferos. II. Algunas especies de los generos Lecane Nitzsch y Lepadella Bory de St. Vincent. Neotropica 25(73):37-44.>
- de Paggi, S.B.J. 1982. Contribution al Conocimento de la fauna Argentina de Rotiferos. III. Nuevos registros especificos en ambientes del Rio Parana Medio. Neotropica 28(80):117-124. <Address: Carrera del Investigador Cientifico Consejo Nacional de Investigaciones Cientificas y Tecnas, Instituto Nacional de Limnologia, Santo Tomé, Santa Fe, ARGENTINA>
- de Paggi, S.B.J. 1982. Notholoca walterkosteii sp. nov. y otros Rotiferos dulceacuicolas de la Peninsula Potter, Isla 25 de Mayo (Shetland del sur, Antartida). Rev. Asoc. Cienc. Nat. Litoral 13:81-95.>
- de Paggi, S.B.J. 1983. Estudio sinoptico del zooplancton de los principales cauces y tributarios del valle aluvial del Rio Parana: Tramo goya diamante (I parte). Rev. Asoc. Cienc. Nat. Litoral 14(2):163-178.>
- Popchenko, V.I., Popchenko, I.I., and Lomakina, L.V. 1983. Daily migrations of lesser reedbed, Typha angustifolia, phytocenosis populations in the Saratov Reservoir (Russian SFSR, USSR). Gidrobiol Zh 19(6): 14-19. <ADDRESS: Inst. Ecol., Volga Basin, Acad. Sci. USSR, Tolyatti, USSR.> <ABSTRACT: BIOSIS: 78-82334. Algae (155 spp.) and 215 invertebrate spp. were found in foulings of T. angustifolia L. in the Saratov Reservoir; diatom, Rotifera, Oligochaetae, Chironomidae and Cladocera being predominant. In the morning and in the evening the organisms gather near the Typhaceae surface, at noon and at night, at the bottom. Illuminance and trophic relations are significant in the diurnal rhythm of the algae and invertebrates.> <KEYWORDS: Rotifer, Oligochaete, Chironomidae, Cladocera, illuminance, trophic relations, diurnal rhythm, insecta, branchiopoda>
- Pourriot, R., Benest, D., Rougier, C., and Clement, P. 1984. Taxonomic characteristics and specificity in the genus Asplanchna, Rotifera. Hydrobiologia 112(1):41-44. <Address: E.N.S. Zoologie, LA 258, 46 Rue D'Ulm, 75230 Paris Cedex 05, FRANCE> <Language: FRENCH> <ABSTRACT: BIOSIS: 78-68187; Eight characters in 2 clones of Asplanchna brightwelli and a clone of A. intermedia, fed with Paramecium and brachionus, are compared to determine the intracolonial and interspecific variations in this complex of species. Trophi

morphology appears to be the most species-specific criterium; the other features (size of males, diameter and ornamentation of resting eggs, nuclear number in syncytial glands) show either genetic or environmental variability. The variation observed in the ornamentation of resting eggs and in the nuclear number of vitellogen was distributed along a continuous gradient.)

Q

Quadri, M.V. and Yousuf, A.R. 1983. Distribution of Anuraeopsis fissa and Notholca acuminata (Rotifera) in relation to some physicochemical factors. J Zool Soc India 34(1-2):13-20. <Address: Post Graduate Department of Zoology, University of Kashmir, Srinagar-190006, INDIA> <ABSTRACT: BIOSIS 87-58260; The effects of some important physicochemical characteristics on the distribution of A. fissa Gosse and N. acuminata Ehrn in a warm monomictic lake in India are discussed. The thermal structure of the lake seems to control the distribution of both species, the former constituting a warm stenothermal and the latter a cold stenothermal form. Anuraeopsis fissa appears to prefer water rich in carbonates and poor in bicarbonates and free CO₂ and with comparatively high pH. Notholca acuminata prefers water with bicarbonate content and free CO₂ and with no carbonates and low pH. Dissolved O₂ seems to be in the tolerable range and therefore has very small influence on the occurrence and abundance of these species.>

R

Radwan, S. 1984. The influence of some abiotic factors on the occurrence of rotifers of Leczna and Wloddawa Lake District Poland. Hydrobiologia 112(2):117-124. <Address: Acad. Agric. Department of Zoology and Hydrobiology, Akademicka 13, 20-934, Lubin, POLAND> <Abstract: BIOSIS: 78-65961; Correlations were studied between 38 species and forms of common pelagic rotifers occurring in lakes of different trophic and 11 physical factors of the environment. Temperature, O₂, electrolytic conductivity, and Ca²⁺ can have a direct influence on the occurrence of many species. The remaining chemical factors had only small effects.>

Raineri, M. 1984. Histochemical investigations of Rotifera Bdelloidea: 1. Localization of cholinesterase activity. Histochem J 16(6): 601-616. <Address: Inst. Comparative Anatomy, Univ. Genoa, Via Balbi 5, 16126 Genova, Italy.> <ABSTRACT: BIOSIS: 78-84195. Cholinesterase activity has been investigated in Rotifera Bdelloidea (Philodina roseola, P. tuberculata, Rotaria rotatoria and other unidentified species) by histochemical methods and in vivo observations. Parallel histological studies were carried out. The enzyme specificity was tested by employing different substrates and inhibitors. The effects in vivo of tubocurarin, bungarotoxin and acetylcholine were also observed. Acetylcholinesterase activity is localized in the nervous and muscular tissues, in sensory organs and in all the ciliated cells. Secretory cells (subcerebral, salivary and pedal glands) and gonad cells (nuclei of the syncytial

vitellarium and follicular layer, oocytes and eggs) show both acetyl- and butyrylcholinesterase activities. The effects in vivo of cholinesterase inhibitors, as well as those of tubocurarine, bungarotoxin and acetylcholine, are consistent with the histochemical results, indicating a cholinergic system of transmission and acetylcholinesterase and butyrylcholinesterase activity. > <KEYWORDS: *Philodina roseola*, *Philodina tuberculata*, *Rotaria rotatoria*, nervous tissue, muscle, sensory organ gonad, secretory cell, acetylcholinesterase, butyrylcholinesterase, acetylcholine, tubocurarine, bungarotoxin, metabolic drug, Rotifera, menispermaceae, serpentes>

Reguera, B. 1984. The effect of ciliate contamination in mass cultures of the rotifer, *Brachionus plicatilis*. *Aquaculture* 40(2):103-108. <Address: Instituto Espanol de Oceanografia, Centro Costero de Santander, Apartado 240, Santander, Spain.> <ABSTRACT: BIOSIS: 79-2213. The rotifer is widely used as a live food source for the early stages of marine fish larvae. High levels of ciliates in mass cultures of the rotifer *B. plicatilis* resulted in reduced yield. This was caused by the activity of the ciliates which brought about aggregation of food algae and reduced their availability to the rotifers. Extracellular products of the ciliates did not seem to be involved. Ciliates thrived in *Dunaliella tertiolecta* cultures, living and pasteurized, and with or without antibiotics. The ciliates competed with the rotifers, and their presence became undesirable. Some practical solutions to control or eradicate ciliates from rotifer cultures were suggested.> <KEYWORDS: *Dunaliella tertiolecta*, marine fish larva, food competition, aquaculture, Rotifera>

Ricci, C. 1984. Alcuni aspetti dello studio della dinamica delle popolazioni. *Cultura e scuola* 90:203-209. <Language: ITALIAN>

Ricci, C. 1984. Culturing of some Bdelloid Rotifers. *Hydrobiologia* 112(1):45-52. <Address: see below> <ABSTRACT: BIOSIS: 78-67991: A method for culturing 19 species of bdelloid rotifers is described. The most suitable food for Bdelloids are bacteria and yeast. Algae do not seem to be an adequate food. Some specificity, in terms of different growths on different diets, is observed. Food concentration is very important when determining growth capacity of a species.>

Ricci, C. and Garibaldi, L. 1984. Adaptive strategies in Rotifera Bdelloidea. *Atti 4° Simposio Dinamica Popolazioni* (Parma 22-24 ottobre 1981):31-39. <Address: Dipartimento di Biologia Sezione di Ecologia, via Celoria 26, I-20133, Milano, ITALY.> <Language: ITALIAN> <ABSTRACT: Life table experiments have been performed on six species of Rotifera Bdelloidea under controlled conditions. Population dynamics parameters such as intrinsic rate of increase, age specific fecundity and net reproduction rate have been calculated. Species coming from uncertain and unpredictable environments reproduce many times, while species from certain and rather stable environments reproduce fewer times with higher

reproductive effort. This seems to result from adaptations exerted by different selective pressures. An increase capacity for being propagules, and determining energy allocations might be found to explain the two reproductive strategies.>

- Ricci, C. and Melone, G. 1984. Macrotrachela quadricornifera (Rotifera, Bdelloidea); a SEM study on active and cryptobiotic animals. *Zoologica Scripta* 13(3):195-200. <Address: see above> <ABSTRACT: The general morphology of Macrotrachela quadricornifera Milne, 1886 in the active and cryptobiotic states is analyzed under the SEM. Some four peculiarities not previously observed are reported, in particular the canaliculated spurs and presence of a sort of groove on the toes. The integument of active animals is perforated with pores and is microsculptured in the trunk region. During cryptobiosis, the animal is contracted, its foot and head being retracted into the trunk: the same microsculpture of the trunk integument is observed.>
- DeRidder, M. 1984. Onderzoekingen over de Verspreiding der Raderdieren in Afrika. II. Raderdieren uit Zuid-Tunesië en uit Zuidelijk Afrika. *Natuurwet. Tijdschr.* 65:155-163. [Notes on the distribution of African Rotifers, II.] <Address: Laboratorium voor morfologie en systematiek der dieren, Rijksuniversiteit Gent, K.L. Ledeganckstraat, 35, 9000-Gent, BELGIUM> <ABSTRACT: A study was conducted on the Rotifer fauna of a series of water samples collected near Zarzis (S. Tunisia) in Zimnanwe and in the coastal area near Durban (Natal, RSA). Thirty five taxa were found, and one was a new "form". Most species are new for the region concerned. [The new form was Lepadella ovalis form undulata.>
- Roddie, B.D., Leakey, R.J.G., and Berry, A.J. 1984. Salinity-temperature tolerance and osmoregulation in Eurytemora affinis, Copepoda: Calanoida, in relation to its distribution in the zooplankton of the upper reaches of the Forth Estuary (Scotland, UK). *J Exp Mar Biol Ecol* 79(2): 191-211. <Address: Dep. of Biol. Sci., Univ. of Stirling, Stirling, Scotland FK9 4LA UK> <ABSTRACT: BIOSIS: 78-82199. E. affinis (Pope) was the dominant in summer and winter surveys of the littoral zooplankton of the upper Forth estuary, Scotland. Maximum numbers were observed in the 0-10 parts per thousand segment, reaching 500,000/m⁻³ in summer and consistently exceeding main channel abundances reported from other studies. In winter, E. affinis was less abundant and shared dominance with the rotifer Synchaeta, which occasionally reached numbers of 311,000/m⁻³. Tidal movements and seasonal changes in freshwater flow were both observed to effect longitudinal displacement of plankton populations. Laboratory tests of salinity-temperature tolerance in Eurytemora showed optimal conditions to be 3-10 parts per thousand at low temperatures, broadly matching distribution patterns in the estuary. Salinity acclimation tests and hemolymph concentration measurements showed that copepods could adapt to changing conditions within 12 h (the duration of a tidal cycle). Acclimation extended tolerance limits in the direction of the acclimation treatment, with survival being

enhanced by gradual rather than abrupt changes in salinity. Investigation of hemolymph DELTA °C in a range of test salinities revealed a pattern of hyperhypo-osmoregulation, with concentrations hyperosmotic to the external medium below 15 parts per thousand and evidence of hypo-osmoregulation at salinities > 20 (parts per thousand). Minimum hemolymph concentrations were equivalent to approximately (parts per thousand) sea water (DELTA °C = 0.4) when held in fresh water. No evidence of salinity-associated respiratory distress was found in respiration experiments. The O₂ consumption values determined (5-7.5 µl O₂·mg dry wt⁻¹·h⁻¹) at optimal salinities and temperatures were similar to reported values for copepods of comparable size.) <KEYWORDS: Synchaeta, seasonality, littoral zone, longitudinal displacement, estuary, hemolymph, acclimation, respiration, survival, oxygen consumption, copepoda, Rotifera>

Rothhaupt, K.O. 1985. A model approach to the population dynamics of the rotifer Brachionus rubens in two-stage chemostat culture. Oecologia 65:252-259. <Address: Ökologische Außenstelle der Universität Frankfurt, Schlagweg 19, D-6490 Schüchtern 1, FEDERAL REPUBLIC OF GERMANY.> <ABSTRACT: A model, based on energy-flow considerations, is presented which describes the population dynamics of Brachionus rubens in the second stage of a two-stage algal-rotifer chemostat. The rotifers are food limited with substrate-inhibition occurring at high algal densities. The model shows two stable states: steady state with constant density of rotifers and washout of the animals. Which one of the stable states is reached depends on the initial conditions. Empirical data are in general agreement with the model. Deviations may be explained by the fact that the data underlying the model calculations are based on a different food alga (Chlorella vulgaris) than the one used in the experiments (Monoraphidium minutum). The observed population growth rate reaches a maximum value of 0.84 (1/day) at algal densities of 3-4 X 10⁶ cells/ml. It decreases at higher algal densities. The egg ratio is related linearly to algal density without being reduced at high algal densities.>

Roy, S.P. 1984. Gut content analysis of odonate nymphs in a fresh-water fish pond at Bhagalpur, Bihar, (India). Entomon 9(1):25-30. <Address: Dep. Zool., Marwari Coll., Bhagalpur, India 812 007.> <ABSTRACT: BIOSIS: 79-84870. The gut content of Odonata nymphs in a fresh-water fish pond at Bhagalpur (Bihar) was analyzed from June, 1979-May, 1980. The gut contents suggest that animals (Rotifera, Cladocera, Copepoda, Rhizopoda and other aquatic insects) comprise the maximum percentage of their diets. Algae constituted only a small percentage of the diet, although their concentration in the water was very high. Their selective nature of feeding for an animal diet and other factors affecting larval development also are discussed.> <KEYWORDS: Rotifera, Cladocera, Copepoda, Rhizopoda, Insecta, Odonata, Branchiopoda, Copepoda, Sarcodina>

- Sawada, M. and Enesco, H.E. 1984. Vitamin E extends life span in the short lived rotifer Asplanchna brightwelli. Exp. Gerontol. 19(3):179-184. <Address: see below> <ABSTRACT: Supplementation with vitamin E at a concentration of 25 µg/ml significantly increased the mean lifespan of the rotifer A. brightwelli. Of the 3 life stages, the prereproductive, reproductive, and postreproductive, only the prereproductive stage was significantly extended by vitamin E supplementation. Vitamin E supplemented rotifers were larger than control rotifers in their early stages of life, but both groups attained the same size by the end of their lifespan.>
- Sawada, M. and Enesco, H.E. 1984. Effects of UV radiation on the lifespan of the rotifer Asplanchna brightwelli. Exp. Gerontol. 19(5):289-296. <Address: Department Biology, Concordia University, 1455 De Maisonneuve Boulevard West, Montreal, Quebec H3G 1M8, CANADA.> <ABSTRACT: BIOSIS: 79-41018. Groups of rotifers of the species A. brightwelli were exposed to UV irradiation at dosages ranging from 50-4800 Jm². The lifespan of the rotifers was significantly reduced by exposure to UV in the range of 200-4800 Jm². A logarithmic decline in lifespan was seen as the UV dose increased. Rotifers were most sensitive to UV exposure during the prereproductive stage at the beginning of their lifecycle. Exposure of rotifers to visible light following UV radiation provided no evidence that photoreactivation could influence lifespan in this species.> <KEYWORDS: prereproductive stage, photoreactivation, Rotifera>
- Sawada, M. and Enesco, H.E. 1984. A study of dietary restriction and lifespan in the rotifer Asplanchna brightwelli monitored by chronic neutral red exposure. Exp. Gerontol. 19(5):329-334. <Address: Department Biology, Concordia University, 1455 De Maisonneuve Boulevard West, Montreal, Quebec H3G 1M8, CANADA.> Abstract: BIOSIS: 79-41019. The rotifer A. brightwelli could be exposed to concentrations of neutral red at 0.1-0.75 µgm·l for 2 consecutive generations with no adverse effect on the lifespan or fecundity of either generation. Chronic exposure to higher concentrations of neutral red caused reductions in both lifespan and fecundity of the rotifers. Because neutral red stains the Paramecium which serve as a food source for the rotifers, the extent of red coloration in each rotifer's gut gave an approximation of how much food that rotifer had consumed. The Paramecium concentration had to be reduced to 100 per ml before pale gut coloration provided clear evidence of reduced food intake or dietary restriction. The group of rotifers with reduced food intake had a significantly longer lifespan than any other group. Their lifespan was 14.2% longer than that of control rotifers.> <KEYWORDS: Paramecium, fecundity, Rotifera, Ciliata.>
- Sawada, M. and Enesco, H.E. 1984. The effect of light, dark or altered circadian cycle on the lifespan of the rotifer Asplanchna brightwelli. Exp. Gerontol. 19(5):335-343. <Address: Department Biology, Concordia University, 1455 De Maisonneuve Boulevard West,

Montreal, Quebec H3G 1M8, CANADA.) <ABSTRACT: BIOSIS: 79-41016. Rotifers were maintained in various light conditions for at least 20 generations. In the 1st set of experiments, lifespan and fecundity data were compared for groups of rotifers maintained under LL (continuous light), DD (continuous dark) or LD 12:12 (control, 12 h light 12 h dark). The mean lifespan of the rotifers cultured in DD conditions was significantly increased as compared to the LL or LD 12:12 groups but there was no fecundity differences. There was no alteration in lifespan or fecundity of the LL group as compared to the LD 12:12 control. In a second set of experiments, an LD 6:18 cycle was imposed to determine whether a shift in the circadian cycle would influence lifespan. Rotifers exposed to the LD 6:18 cycle and to the DD conditions showed an 18% and 22% increase in mean lifespan respectively. Lifespan is influenced by the circadian cycle.) <KEYWORDS: Fecundity, Rotifera.>

Schaber, P. and Schrimpf, A. 1984. On morphology and ecology of the Filinia terminalis - Filinia longiseta group, Rotatoria, in Bavarian and Tyrolean lakes. Arch Hydrobiol 101(12):247-258. <Address: Abt. Limnol., Inst. Zool., Univ. Innsbruck, Technikerstr. 13, A-6020 Innsbruck.> <ABSTRACT: BIOSIS: 79-75562. Lakes differing in size and altitude, and ranging from oligotrophic to polytrophic were examined and found to contain Filinia longiseta, F. terminalis and F. hofmanni. The species occur singly or sympatrically, and can be distinguished morphologically and on the basis of differing temperature and O₂ requirements. The morphological differences involved are the length of the body appendages, the relationship between the lengths of the lateral and caudal setae, and the mobility of the caudal seta.> <KEYWORDS: Filinia hofmanni, temperature, oxygen, Rotifera>

Schmitz, D.C. and Osborne, J.A. 1984. Zooplankton densities in a Hydrilla infested lake. Hydrobiologia 111(2):127-132. <Address: Bureau Aquatic Plant Res Control, Fla Department of Natural Resources, 3900 Common Ewalth Blvd, Tallahassee, FL, 32303, USA> <ABSTRACT: 78-58276; The number of individuals and species of zooplankton were sampled concurrently with Hydrilla biomass and water quality for 1 year in a small, eutrophic central Florida lake, USA. During the study there was a shift from limnetic to littoral species consisting principally of rotifers. Hydrilla growth did not affect the mean number of cladoceran or copepod species, but may have led to an increase in rotifer species.>

Segner, H., Orejana-Acosta, B., and Juario, J.V. 1984. The effect of Brachionus plicatilis grown on 3 different species of phytoplankton on the ultrastructure of the hepatocytes of Chanos chanos. Aquaculture 42(2):109-116. <Address: Dep. Zool., Univ. Heidelberg, Im Neuenheimer Feld 230, 6900 Heidelberg, FRG.> <ABSTRACT: BIOSIS: 79-48287. The effect of the rotifer, B. plicatilis, grown on unialgal cultures of Isochrysis galbana, Tetraselmis sp. and Chlorella sp. on the hepatocytes of milkfish fry was evaluated by EM. Rotifers grown on the 3 different spp. of phytoplankton brought about different ultrastructural features in

milkfish fry hepatocytes. Best results were obtained from fry reared on Isochrysis-fed rotifers. The use of marine Chlorella-fed rotifers as feed for fry resulted in the poorest hepatocyte ultrastructure, indicating that this was nutritionally the least adequate cultured food. No diet produced an optimal hepatocyte ultrastructure similar to that obtained by feeding the fry with a mixture of artificial feed and newly hatched Artemia nauphii.) <KEYWORDS: Artemia, dietary factor, aquaculture, Osteichthyes, Rotifera.>

Schramm, U. 1984. Anhydrobiosis: Latent life: Cytological and cytochemical studies of a rotifer. 7th European Anatomical Congress, Innsbruck, Austria, Sept. 3-7, 1984. ACTA ANAT 120(12):67. <ABSTRACT: BIOSIS: 28-31316.> <KEYWORDS: Habrotricha rosa, cell nuclei, mitochondria, endoplasmic reticulum, ribosome, water content, glycogen, triglyceride, Rotifera>

Sendacz, S. 1984. The zooplankton community of Billings Reservoir, Sao Paulo. Hydrobiologia 113(0):121-128. <Address: Inst. de Pesca, Divisao de Pesca Interior, Sao Paulo, BRASIL> <ABSTRACT: BIOSIS: 28-15481; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Thermocyclops crassus, Metacyclops mendocinus, Brachionus, Polyarthra, Cyanophyceae, littoral zone, seasonality, Copepoda, Rotifera>

Sharma, P.C. and Pant, M.C. 1984. Abundance and community structure of limnetic zooplankton in Kumaun lakes, India. Int Rev Gesamten Hydrobiol 69(1):91-110. <Address: Adarsh Nangar, Talli Bamori, Haldwani, Nainital, INDIA.> <ABSTRACT: BIOSIS: 79-2040. The zooplankton compositions in the limnetic zones of 2 subtropical lakes, the Nainital and the Bhimtal (India) were similar in terms of species composition. Numerically, zooplankters were abundant during the thermal stratification (summer-autumn) period and scarce during the overturn (winter). The density of the zooplankton population reported from the eutrophic Lake Nainital was higher than in the oligotrophic Lake Bhimtal. Among the 3 groups studied copepods dominated over cladocerans and rotifers in both the lakes. The Shannon Weaver diversity was highest for Lake Bhimtal than for Lake Nainital. The community structure is also discussed on the basis of crustacean species.> <KEYWORDS: Copepod, Cladoceran, Rotifer, zooplankton, species composition, thermal stratification, overturn, eutrophic lake, oligotrophic lake, Copepoda, Branchiopoda, Rotifera>

Sieswerda, P. and Policansky, D. 1984. A flow-through system for rearing flatfish through metamorphosis. Prog Fish-cult 46(1): 13-19. <Address: New England Aquarium, Central Wharf, Boston, Mass. 02110, USA> <ABSTRACT: BIOSIS: 78-82441. The details of a flow-through system developed at the New England Aquarium for rearing starry flounders (Platichthys stellatus) through metamorphosis are presented to provide a comparison with closed systems and an abbreviated manual for rearing of flatfish and their food organisms. The flow-through system allowed rapid response to changes in water quality and permitted the use of very high food

- concentrations. The success of the operation also depended on the production of up to 106 rotifers (Brachionus plicatilis) per day, which depended on the production of at least 20 l/day of algal (Dunaliella sp.) culture. Up to 682 fish were reared through metamorphosis per 19-1 tank. <KEYWORDS: Platichthys stellatus, Brachionus plicatilis, Dunaliella sp., food organism, water quality, New England Aquarium, Rotifera>
- Snell, T.W. and Winkler, B.C. 1984. Isozyme analysis of rotifer (Brachionus plicatilis) proteins. Biochem Syst Ecol 12(2):199-202. <Address: Div. of Sci., Univ. of Tampa, Tampa, FL 33606, USA> <ABSTRACT: BIOSIS: 79-4632. An analysis of isozyme variation of 5 enzymes among 17 strains of the brackish-water rotifer, B. plicatilis, using thin-layer polyacrylamide electrophoresis, showed that it was possible to resolve genetic differences. It is suggested that isozyme characters will be useful in distinguishing sub-species of the group. <KEYWORDS: electrophoresis, genetics, enzyme, Rotifera>
- Soto, D., Vila, I., and Villalobos, B. 1984. Temporal and spatial distribution of rotifers in a Chilean reservoir: A possible effect of impoundment hydrodynamics. Hydrobiologia 114(1):67-74. <Address: Department of Biology, San Diego State Univ., San Diego, CA 92182-0057, USA> <ABSTRACT: BIOSIS: 79-38903. Rotifers were sampled at monthly intervals for a year at 4 monitoring stations in Rapel Reservoir (a hydroelectric impoundment) in central Chile (34° 02' S; 71° 35' W). Fifteen species were identified, but only Keratella cochlearis was consistently found at each station, it usually was the most abundant (> 50% of total rotifers). Marked differences were found among sites; stations 1 and 2, those nearest to the dam, showed greatest rotifer densities in spring and autumn. Station 4, that nearest to the inflowing rivers, had its highest rotifer abundance in summer. Station 8 had the highest mean density but the least marked seasonal changes in rotifer numbers. The impoundment water dynamics and the relative locations within the lake (distance from the dam or from the rivers) are suggested as determinants for different rotifer assemblages and, probably, for most other planktonic organisms. <KEYWORDS: Keratella cochlearis, plankton, river, lake, seasonality, dam, Rotifera>
- Stemberger, R.S. and Gilbert, J.J. 1984. Body size, ration level and population growth in Asplanchna. Oecologia (Berl) 64(3):355-359. <Address: Dartmouth College, Department Biology, Hanover, New Hampshire 03755, USA> <ABSTRACT: BIOSIS: 79-57145. The daily ration required to maintain a population growth rate, rm , of zero (threshold ratio) increased with increasing Asplanchna body mass. This relationship is described by the equation $T = 0.342 W^{0.797}$ where T = threshold ration ($\mu\text{g/day-1 dry mass}$) and W = Asplanchna body mass ($\mu\text{g/adult-1 dry mass}$). The threshold rations of large campanulate morphs of A. silvestrii was 3.7 times greater than that of conspecific saccate morphs suggesting that campanulates may be restricted to food-rich habitats. The daily ration required to maintain rm that is half the maximal population growth rate

- increased with increasing Asplanchna body mass and is described by the equation $H = 1.107 W^{1.103}$ where H = ration level and W = Asplanchna body mass. This population growth characteristic may reflect adaptations of rotifers to resource level. The relationships between ration level, food concentration, and Asplanchna body mass do not support the predictions of the size-efficiency hypothesis but are consistent with observed patterns of species distribution in nature. <KEYWORDS: Asplanchna, body size, diet, food, habitat, Rotifera>
- Stemberger, R.S. and Gilbert, J.J. 1984. Spine development in the rotifer, Keratella cochlearis: Induction by cyclopoid copepods and Asplanchna priodonta. Freshwater Biol. 14(6): 639-648. 1984. FWBLA <Address: Department of Biology Sciences, Dartmouth College, Hanover, NH 03755, USA> <ABSTRACT: BIOSIS: 79-57173. Spine development in a clone of unspined K. cochlearis was promoted by a water soluble factor released by the copepods Tropocyclops prasinus and Mesocyclops edax and by the predatory rotifer A. priodonta. Between 9 and 55% of K. cochlearis populations cultured in predator-conditioned media responded to the inducing chemical. The K. cochlearis form possessing a posterior spine of medium length was much less susceptible to predation by small Tropocyclops and Asplanchna than the form lacking the posterior spine. These predators consistently selected the unspined form over the spined form when offered equal densities of each. However, both spined and unspined forms were equally susceptible to predation by large Mesocyclops. The phenotypic variation of offspring produced from induced unspined Keratella females encompassed much of the variation reported for the taxon in North America. These morphotypes are similar to the variation of forms reported for the K. cochlearis tecta series known from Europe. The North American morphotypes should be identified in studies of this species because the presence of the posterior spine can greatly affect predator selectivity.> <KEYWORDS: Tropocyclops prasinus, Mesocyclops edax, chemical induction, predation, defense, North America, Europe, Rotifera, Copepoda>
- Sudzuki, M. 1984. Distribution percent of lorica morphotypes in rotifer, Brachionus plicatilis and its relatives. Zool Sci (Tokyo) 1(6):998. 55th Annual Meeting of the Zoological Society of Japan, Morioka, Japan, Sept. 27-29, 1984. <Address: Biol. Lab., Nihon Daigaku, Omiya.> <ABSTRACT: BIOSIS: 28-91343.> <KEYWORDS: Brachionus rotundiformis, Brachionus mulleri, Brachionus typicus, Brachionus hepatotomus, Rotifera>
- Szczerbowski, J.A. and Mamcarz, A. 1984. Rearing of coregonid fishes, Coregonidae, in illuminated lake cages: 2. Environmental conditions during fish rearing. Aquaculture 40(2):147-162. <Address: Inland Fisheries Inst. Olsztyn, Kortowo, POLAND.> <ABSTRACT: BIOSIS: 79-2211. Observations of changes taking place in the environmental conditions during the rearing of coregonid fish (Coregonus lavaretus and C. peled) in illuminated lake cages revealed that physical factors (water temperature, O₂, transparency)

were similar in the vicinity of cages and in other parts of the lake. The abundance of zooplankton near the cages increased at night 1.4-fold, in relation to the daytime value, because organisms were attracted by the light. Relatively high amounts of food for fish kept in the cages occurred only during approximately 4 mo. of the year. The numbers of rotifers around cages was 1.2-fold higher than in the cages; those of copepods and cladocerans were 1.4-fold higher. Along with the plankton, several fish species gathered around illuminated cages: bleak (*Alburnus alburnus*), perch (*Perca fluviatilis*), roach (*Rutilus rutilus*) and other small fish. They fed in the same way as the fish in the cages and constituted a factor limiting plankton numbers in cages. <KEYWORDS: *Coregonus lavaretus*, *Coregonus peled*, *Alburnus alburnus*, *Perca fluviatilis*, *Rutilus rutilus*, zooplankton, Rotifer, Copepod, Cladocera, food competition, Osteichthyes>

T

Tait, R.D., Shiel, R.J., and Koste, W. 1984. Structure and dynamics of zooplankton communities, Alligator Rivers Region, Northern Territory, Australia. *Hydrobiologia* 113(0):1-14. <Address: Esso Aust. Ltd., P.O. Box 4047, Sydney 2001, AUSTRALIA.> <ABSTRACT: BIOSIS: 28-15473; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Rotifer, Crustacea, uranium mining, water quality fluctuation, environmental interaction, spatial variation, temporal variation>

Timms, R.M. and Moss, B. 1984. Prevention of growth of potentially dense phytoplankton populations by zooplankton grazing in the presence of zooplanktivorous fish in a shallow wetland ecosystem. *Limnol Oceanogr* 29(3):472-486. <Address: School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, UNITED KINGDOM> <ABSTRACT: BIOSIS: 78-66077; Zooplankton populations were of rotifers and small-bodied Cladocera in Hoveton Great Broad, but mostly of Cladocera, including large-bodied individuals of plant-associated species, in Hudsons Bay.>

Turner, P.N. 1984. Rotifers in the plankton of Lake Maury, Newport News, Virginia (USA). *Env. J.* 35(3):216-221. <Address: 6701 Coolridge Road, Camp Springs, MD, USA.> <ABSTRACT: BIOSIS: 79-66322. The planktonic rotifers of Lake Maury, Newport News, Virginia are discussed. Comparisons with species found previously (Turner 1980) are given. A species list of planktonic rotifers known to occur in Lake Maury is also given.>

Unni, K.S. 1983. Primary production and diurnal variation in a tropical fish pond. *Trop Ecol* 24(2): 170-179. <Address: P.G. Coll. Chhindwara, INDIA> <ABSTRACT: BIOSIS: 78-90406. The gross primary production of a fish pond receiving sewage and being used for domestic laundry amounted to $36.01 \text{ g } 0.2 \cdot \text{m}^{-2} \cdot \text{day}^{-1}$ by the diurnal integrated curve method and $45.2 \text{ g } 0.2 \cdot \text{m}^{-2} \cdot \text{day}^{-1}$ by

the lightdark bottle method. Production was negative at 1 m depth due to 52-140% consumption of O_2 for respiration. A distinct thermal stratification was found during the day. Electrical conductivity varied both vertically and horizontally (434-515 $\mu mho \cdot cm^{-1}$). A well marked inverse relationship between dissolved O_2 and free CO_2 and between phenolphthalein and m.o. alkalinities were recorded. The desmid Closteriopsis was in bloom ranging between 21-176 million cells $\cdot l^{-1}$. Closteriopsis, Anabaena and Anabaenopsis showed distinct diurnal movements. Cyclops, Brachionus, Keratella and Polyarthra also exhibited nocturnal movement to the surface. > <KEYWORDS: Cyclops, Brachionus, Keratella, Polyarthra, thermal stratification, dissolved oxygen, electrical conductivity, carbon dioxide, alkalinity, movement, respiration, Cyanophyta, Crustacea, Rotifera, Chlorophyta>

★V★

Vietinghoff, U., Erdmann, N., Arndt, H., Kell, V., and Hubert, M.-L. 1984. Integrated samples provide accurate means of parameters characterizing aquatic ecosystems. Int Rev Gesamten Hydrobiol 69(1):121-131. > <Address: Sekt. Biol., Wilhelm-Pieck-Univ., DDR-2500 Rostock, Universitaetsplatz 2, FEDERAL REPUBLIC of GERMANY> <ABSTRACT: BIOSIS: 79-2078. The measurement of ecosystem parameters normally involves considerable effort in terms of sampling and analysis due to their variation in time and space. This contribution describes the advantages and properties of the integrated sample and demonstrates them by comparing the statistical properties of separate samples (number of Filinia longiseta per unit volume), an integrated sample (total chlorophyll a concentration) and phytoplankton samples analyzed by the Utermohl method. A working hypothesis presented to explain the causes of overdispersion that hinders phytoplankton analysis and to suggest ways of eliminating it. > <KEYWORDS: Filinia longiseta, phytoplankton, chlorophyll a, overdispersion, temporal variation, spatial variation, Rotifera>

Vietinghoff, U., Hubert, M.-L., Heerkloss, R., Arndt, H., and Schnese, W. 1984. A mathematical submodel for the planktonic Rotatoria in the ecosystem of the Barther Bodden, southern Baltic Sea. INT REV GESAMTEN HYDROBIOL 69(2):159-172. > <Address: Sektion Biologie, Wilhelm-Pieck-Universität, DDR-2500 Rostock, Universitaetsplatz 2, GERMAN DEMOCRATIC REPUBLIC> <ABSTRACT: BIOSIS: 79-1996. The pelagic rotifer species feeding on fresh detritus composed of dead diatoms and green algae are of particular importance in terms of biological production in the shallow eutrophic Barther Bodden. The submodel presented here refers only to this functional group (Filinia longiseta, Brachionus quadridentatus, and Keratella cochlearis). The biological situation, the working hypotheses, the equation system, the measured values and coefficients used and the wiring diagram are given. The curves obtained with the model are shown in detail and tested against various criteria. Agreement between the model curves and the measured data is good. > <KEYWORDS: Filinia longiseta, Brachionus quadridentatus, Keratella cochlearis,

diatom, green algae, feeding, Rotifera)

W

Watts, S.D.M. and Atkins, A.M. 1984. Kinetics of 4-aminobutyrate:2-oxoglutarate aminotransferase, EC 2.6.1.19, from Nippostrongylus brasiliensis. Mol Biochem Parasitol 12(2):207-216. <Address: Biochem. Parasitol. Dep., Wellcome Res. Lab., Beckenham, Kent BR3 3BS, England.> <ABSTRACT: BIOSIS: 79-13722. A GABA transferase (4-aminobutyrate:2-oxoglutarate aminotransferase; EC 2.6.1.19) preparation from N. brasiliensis contained only 1 peak of enzyme activity with a highly basic pI of 10.5 when analyzed by isoelectric focusing and chromatofocusing. This material was used in kinetic studies to demonstrate that the parasite enzyme reaction mechanism conforms to the usual binary, non-sequential (Bi Bi Ping Pong) type found with aminotransferases. The Km for 4-aminobutyrate was 0.33 mM, the Km for 2-oxoglutarate was 0.57 mM and Ki for glutamate was 0.35 mM. In holoenzyme reconstitution experiments with the cofactor, pyridoxal 5-phosphate, the KD was 1.54 μ M. The values are comparable to those reported for other tissues. Only 2-oxoglutarate could function as the keto acid substrate whereas several amino acids besides 4-aminobutyrate (beta-alanine, alpha-L-alanine, L-aspartate and L-arginine) could apparently act as substrate although the possible presence of other amino acid: 2-oxoglutarate aminotransferases was not excluded. In preliminary studies on the usefulness of conventional substrate analogs as parasite gamma-aminobutyric acid transferase inhibitors only canaline was effective.> <KEYWORDS: kinetics, 2-oxoglutarate, isoelectric point, chromatofocusing, keto acid substrate, 4-aminobutyrate, amino acid, canaline, enzyme inhibitor drug, Rotifera> <NB: the editors are not sure why this reference showed up in the BIOSIS search. However, ROTIFER is one of the keywords listed for the reference.>

Weglenska, A., Bownik-Dylinska, L., and Ejsmont-Karabin, J. 1983. Biotic structure and processes in the Lake system of River Jorka Watershed Masurian Lakeland Poland: Structure and dynamics of zooplankton. Ekol Pol 31(3):679-718. <Address: Department of Hydrobiol. Inst Ecology, Polish Acad. Sciences, Dziekanow, Lesny, 05-092 Lomianki, POLAND> <ABSTRACT: BIOSIS: 78-74200; Seasonal changes in numbers, biomass, and zooplankton structure (Ciliata, Rotatoria, Crustacea) were analyzed in 5 lakes of the river Jorka watershed.>

Williamson, C. 1984. Laboratory and field experiments on the feeding ecology of the cyclopoid copepod, Mesocyclops edax. Freshwater Biol 14(6): 575-586. <Address: Department of Biology, Williams Hall No. 31, Lehigh University, Bethlehem, Pa. 18015, USA.> <ABSTRACT: BIOSIS: 79-57167. Gut contents of M. edax consisted of rotifers, cladocerans, copepods and algae, the importance of each varying seasonally. Functional response experiments using 2 soft-bodied rotifers as prey showed an increase in ingestion rate with increasing prey density up to a threshold, followed by a decline.

Enclosure experiments with natural assemblages of prey from 2 lakes indicated that M. edax is a selective feeder and may ingest 50 or more prey per predator per day, accounting for up to 17% of the standing crop of its preferred prey species per day in nature. <KEYWORDS: Rotifer, Cladoceran, Copepod, Copepoda>

Wissel, C. 1984. A universal law of the characteristic return time near thresholds. *Oecologia (Berl)* 65(1):101-107. <Address: Fachbereich Physik Univ., Lahnberge, D-3550 Marburg, FRG.> <ABSTRACT: BIOSIS: 79-84885. Dramatic changes at thresholds in multiple stable ecosystems may be irreversible if caused by man. The characteristic return time to an equilibrium increases when a threshold is approached. A universal law for this increase is found, which may be used to forecast the position of a threshold by extrapolation of empirical data. Harvesting experiments on populations are proposed that can be used to verify the method. Preliminary harvesting experiments on rotifer populations display a good agreement with the theory.>

Wodajo, K. and Belay, A. 1984. Species composition and seasonal abundance of zooplankton in 2 Ethiopian Rift Valley lakes: Lakes Abiata and Langano. *Hydrobiologia* 113(0):129-136. <Address: Dep. Biol., Sci. Fac., Addis Abeba Univ., P.O. Box 1176, Addis Abeba, ETHIOPIA.> <ABSTRACT: BIOSIS: 28-15482; Symposium on Tropical Zooplankton, Sao Carlos, Brazil.> <KEYWORDS: Cladocera, Copepoda, Rotifer, Brachionus, conductivity, Branchiopoda>

X

Y

Yamasaki, S. and Hirata, H. 1983. Test on the use of electrode respirometer for the Rotifer: Brachionus Plicatilis. *Mem Fac Fish Kagoshima Univ* 32(0): 91-96. 1983. <Address: Lab. of Fish Cultivation Physiol., Fac. of Fisheries, Kagoshima Univ., Kagoshima, 890 JAPAN.> <ABSTRACT: BIOSIS: 78-92286. As a justification for the use of an electrode respirometer as previously reported, measured DO (dissolved O₂) values were compared with those obtained by the Winkler methods. The optimum experimental rotifer density in the respiration chamber, was also studied. For the comparison of DO values, the water of several DO levels was supplied to the respiration chamber. As soon as DO values were recorded through the DO meter at 3 different shaking speeds, 10, 20 and 30 rpm, DO content of the water was determined by the Winkler method. These measurements were conducted at a constant temperature of 20°C. Strong positive relationship was observed between DO values measured by DO meter and the Winkler method at each shaking speed. The regression coefficients were stable at each shaking speed without regard to salinity of water sample, i.e., 1.03 ± 0.02 at 10 rpm, 1.06 ± 0.02 at 20 rpm and 1.08 ± 0.02 at 30 rpm. In the rotifer density test, O₂ consumption rates of rotifers measured at densities from 2-487 individuals·ml⁻¹, were compared after recalculation to O₂ consumption by unit weight. Rotifers were

cultured continuously at apprx. $20 \text{ inds} \cdot \text{ml}^{-1}$ and 20°C , fed on concentrated marine Chlorella saccharophila, maintaining the density within a range from 1.5×10^6 to $6 \times 10^6 \text{ cells} \cdot \text{ml}^{-1}$. Rotifers for the measurement were collected at the food density of 2×10^6 to $3 \times 10^6 \text{ cells} \cdot \text{ml}^{-1}$. Averages and standard deviations of O_2 consumption rates by unit weight in the rotifer density range of 2-4, and 10-487 $\text{inds} \cdot \text{ml}^{-1}$ were 7.53 ± 2.53 and $8.92 \pm 0.68 \times 10^{-6} \text{ ml} \cdot \text{dry} \cdot \mu\text{g}^{-1} \cdot \text{h}^{-1}$, respectively; those of 2-18 and 25-487 $\text{inds} \cdot \text{ml}^{-1}$ were 7.90 ± 2.13 and $9.04 \pm 0.54 \times 10^{-6} \text{ ml} \cdot \text{dry} \cdot \mu\text{g}^{-1} \cdot \text{h}^{-1}$, respectively. Coefficients of variance were estimated at 0.34 and 0.08 in the former, 0.27 and 0.06 in the latter.) <KEYWORDS: oxygen consumption, Rotifera>

Yufera, M. y E. Pascual. 1984. La producció de organismos zooplanctónicos para la alimentación larvaria en acuicultura marina. Inf. Técn. Inst Inv Pesq 119:3-27. [The production of zooplankton organisms as larval food in marine aquaculture.] <Address: see below> <ABSTRACT: The larval feeding of fish and crustaceans is a critical period in marine aquaculture. This is due to the strict nutritional requirements of most species. Mass culture of zooplankton organisms was developed in response to the increasing need for living prey as larval food. The organisms most widely used are the rotifer Brachionus plicatilis, the brachiopod Artemia salina, and to a lesser extent some copepod species. This paper describes the most usual production techniques, with emphasis on rotifer culture. Also, studies on the production of other prey, less usual, but interesting to obtain [and providing] a higher variety and quality in the larval food, are described. Finally, the influence of food quality on survival of larvae at the first feeding is discussed.>

Yufera, M. y E. Pascual. 1984. Influencia de la dieta sobre la puesta del rotífero Brachionus plicatilis en cultivo. Investigación Pesquera. 48(3):549-556. [Influence of diet on egg deposition in the rotifer Brachionus plicatilis in culture. <Address: Institución de Investigaciones Pesqueras de Cádiz, Puerto pesquero, s/n. 11006 Cádiz, SPAIN.> <ABSTRACT: BIOSIS: 79-86969: Egg development time and evolution of the ratio eggs/female in two Brachionus plicatilis strains (Bs and S-1) fed with different species of algae (Nannochloris oculata, N. maculata, Nannochloropsis oculata, and N. gaditana) have been determined. Development time of the eggs for the strain Bs are always shorter than those of strain S-1. In both organisms, the longer development times were found when fed with N. gaditana. Curves of the ratio eggs/females show a characteristic peak in the second day of culture, then decreasing quickly when the initial food is low, and more gradually with increasing the initial cell concentration. Further peaks can be observed depending on food level. Population growth when fed with N. gaditana show substantial lower values for the two strains.> <KEYWORDS: Nannochloris oculata, Nannochloris maculata, Nannochloropsis oculata, Nannochloropsis gaditana, growth, reproductive rate, Rotifera>

Yúfera, M., Rodríguez, A., and Lubián, L.M. 1984. Zooplankton ingestion and feeding behavior of Penaeus kerathurus larvae reared in the laboratory. Aquaculture 42:217-224. <Address: see above>
 <ABSTRACT: BIOSIS: 79-75736: Ingestion of Brachionus plicatilis and Artemia salina nauplii during larval and early postlarval stages of Penaeus kerathurus has been investigated. Results show an active ingestion of rotifers from protozoa II until postlarva II. Artemia nauplii are eaten from the mysis II stage. From the first postlarval stage, P. kerathurus requires a prey of greater size than Brachionus. In the absence of such prey the animals tend to be cannibalistic.>

Z

INDEX

- Acetylcholine, 30
 Acetylcholinesterase, 30
 African rift lakes, 41
 Age, 30
 Aging, 12, 33
 Alkaline protease, 16
 Alkaline proteases, 16
 Alpine cirque lake, 6
 Anhydrobiosis, 35
Anuraeopsis fissa, 25, 30
 Artificial lake, 6
Ascomorpha ecaudis, 29
Asplanchna, 15
Asplanchna brightwelli, 10 to 12,
 21, 23, 29, 33 to 34
Asplanchna intermedia, 29
Asplanchna priodonta, 37
Asplanchna silvestrii, 36
 Batch culture, 26
 Bdelloid, 5 to 6, 30
 Bdelloidea, 31
 Biomass, 24
 Body size, 8, 36
 Body wall outgrowths, 10
Brachionus, 38
Brachionus plicatilis, 3, 7, 12
 to 13, 16 to 19, 23, 26, 30,
 34 to 37, 41 to 42
Brachionus quadridentatus, 40
Brachionus rubens, 32
Brachionus sp., 21
 Brine shrimp nauplii, 22
 Bungarotoxin, 31
 Butyrylcholinesterase, 30
 Calcium, 29
 Campanulate, 36
 Carbonate equilibrium system, 29
Cephalodella forficula, 10
Cephalodella sp., 21
Ceriodaphnia sp., 8
 Chemostat, 32
 Cholinergic, 30
 Circadian cycle, 34
 Clones, 29
 Community structure, 14, 25, 35,
 38
 Community structure, 41
Conochiloides coenobasis, 24
Conochilus coenobasis, 29
Conochilus hippocrepis, 21
Conochilus natans, 29
Conochilus sp., 8
 Copepod predator, 40
 Copper, 8
 Cryptobiotic, 31
 Culture, 13 to 14, 17, 26 to 27,
 30, 32, 35, 42
 Cyclopoid copepod, 37
 Cytochemical studies, 35
 Cytological studies, 35
Diaphanosoma sp., 8
 Diel photoperiod, 34
 Diel vertical migration, 20, 38
 Diet, 42
 Distribution, 29
 Dormancy, 35
 Efficiency ratios, 8
 Egg development, 42
Ehirava fluviatilis, 11
 Embryogenesis, 10
 Environmental toxicology, 8, 19,
 22, 27
 Enzymes, 16
Epiphanes clavulata, 29
Euchlanis sp., 21
Euchlanis triquetra, 21
 Eutrophication, 4, 9
 Fecundity, 6, 33 to 34
 Feeding, 10
Filinia hofmanni, 34
Filinia longiseta, 11, 34, 31
Filinia opoliensis, 29
Filinia terminalis, 21, 34
 Fish culture and rotifers, 38
 Fitness, 10
Floscularis janus, 13
 Food, 17, 26, 30, 32
 Food limitation, 11
 Fungi, 5
 Grazing rates in zooplankton, 8
 Histochemical, 30
 Indian lakes, 36
 Induced sexuality, 10
 Isozyme, 37

- Karstic lake, 24
Kellicottia bostoniensis, 28
Keratella, 38
Keratella americana, 24
Keratella cochleari, 8
Keratella cochlearis, 18, 24, 28, 36 to 37, 39
Keratella cochlearis micracantha, 18
Keratella cochlearis var. hispida, 18
Keratella cochlearis var. tecta, 18
Keratella macracantha-micracantha-tecta series, 18
Keratella serrulata, 29
Keratella slacki, 6, 15
Keratella sp., 21
Keratella tecta, 18
Keratella testudo, 21

 Lake Alexandrina, 14
 Lake chemistry, 20
 Lake Khurpatal, India, 25
 Lake kinneret, 15
 Lake maury, 38
 Lake percile, 24
 Lake valencia, 19
 Lauterborn cycles, 18
Lecane, 29
Lecane sp., 21
Lepadella, 29
Lepadella ovalis form undulata, 3
Lepadella ovalis form undulata., 31
Lepadella sp., 21
 Life history, 33
 Life span, 33
 Life table, 5 to 6, 14
 Lifespan, 12, 33 to 34
 Lorica morphotype, 37

 Macrophyte, 34
 Macrophytes, 6
Macrotrachela quadricornifera, 31
 Mass culture, 17
 Mastax, 17
 Mathematical submodel, 39
 Microzoobenthos, 4
Monommata sp., 21
Monostyla sp., 21
 Morphology, 29
 Nervous tissue, 30
 Neutral red stain, 33
Notholca acuminata, 21, 29
Notholca foliacea, 21
Notholoca walterkoste, 3, 29
 Nucleic acid synthesis, 10
 Oxygen, 9
 Oxygen consumption rate, 41

 Parasite, 5
 Pelophilous biocenosis, 4
 Pesticides, 19
 Ph, 29
Philodina, 6
Philodina roseola, 14, 30
Philodina tuberculata, 30
 Photoreactivation, 12, 33
 Plankton trap, 20
Platylas quadricornis, 21
Platylas patulus, 5 to 6
Platylas quadricornis, 21
Ploesoma lenticulare, 29
Ploesoma truncatum, 29
Ploesoma truncata, 21
 Pollution, 27
Polyarthra, 38
Polyarthra minor, 21
Polyarthra sp., 27
Polyarthra vulgaris, 21
 Polymorphism, 15
Pompholyx complanata, 21
Pompholyx sulcata, 24
 Population dynamics, 14, 32, 36
 Population dynemaics, 4
 Population growth, 36
 Predation, 15, 32, 37
 Predatory insect, 32
 Prereproductive stage, 33
 Protein synthesis, 10
Ptygura pilula, 12

 R, 30
 Reproduction, 5 to 6, 30
 Reproductive cost, 5 to 6
Rotaria rotatoria, 30
 Rotifer-macrophyte interactions, 34
 Rotifers as crab larvae food, 19, 22
 Rotifers as fish food, 7 to 11, 13, 23, 34 to 35, 42
 Rotifers as shrimp larvae food, 12, 42
 Rotifers from newfoundland, 9

Saccate, 36
Salinity, 32
Sampling, 20
Sem, 31
Sessile rotifer, 12 to 13
Sewage treatment, 14
Sexual reproduction, 18, 23
Size-efficiency hypothesis, 36
Size-selective feeding, 22
Soil rotifers, 5
Species composition, 11
Species diversity, 12
Species-selective predation, 11
Spine, 15, 37
Spines, 16
Substrate, 12 to 13
Sudan, 15
Survival, 8
Swamp, 15
Synchaeta, 32
Synchaeta pectinata, 21
Temperature, 11, 18, 29
Testudinella patina, 21
Thailand, 8
Tocopherol, 33
Towed net, 20
Toxic agent, 8, 19, 22, 27
Transitional forms, 18
Trichocerca rousseleti, 28
Trichocerca sp., 11, 21
Tropics, 5, 8 to 9, 11, 15, 19, 35, 41
Tube building, 10
Tubocurarine, 30
UV radiation, 12, 33
Vitamin E, 33
Yeast, 17
Zooplankton cluster analysis, 4
Zooplankton community, 6