NUMBER 3 December 1976

ROTIFER NEWS

A Newsletter for Rotiferologists throughout the World

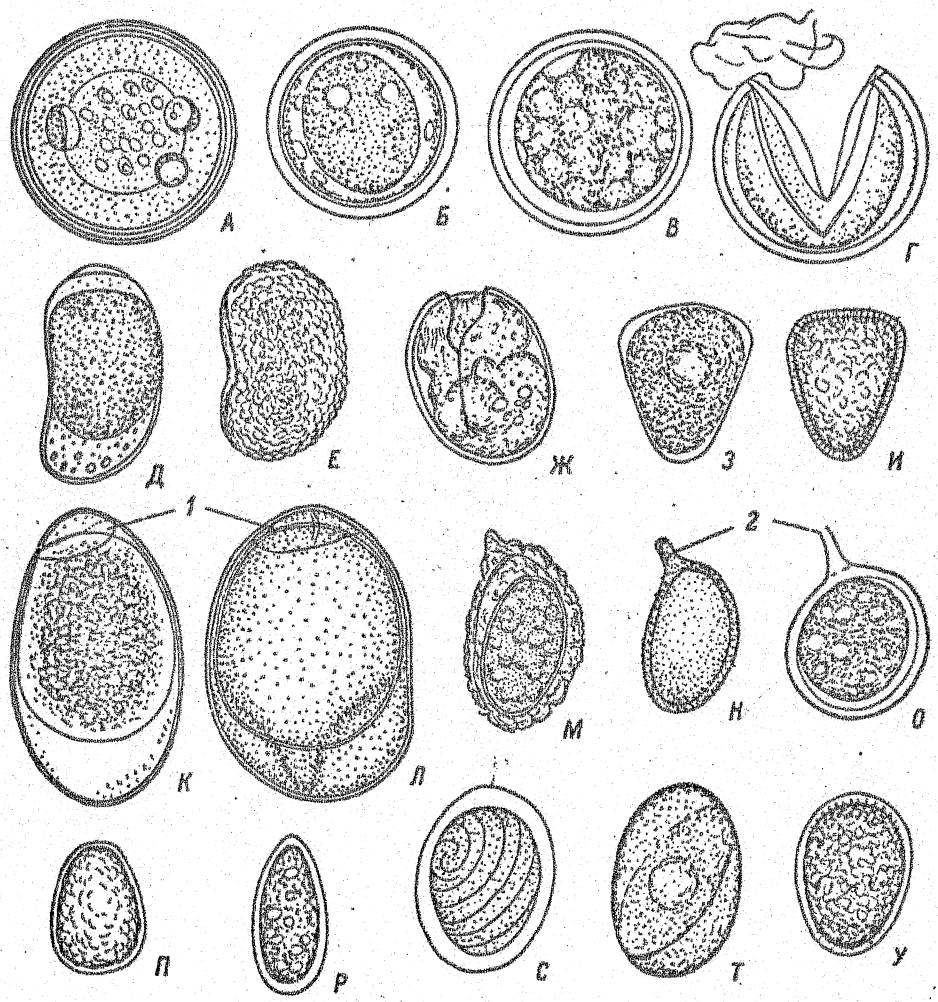

Рис. 60. Покоящиеся яйца родов *Asplanchna*, *Brachionus*, *Keratella*, *Notholca*, *Anuraeopsis*, *Conochilus*, *Conochiloides*, *Pompholyx* и *Collotheca*. *А—Г* — *Asplanchna priodonta*: *А* — свежеотложенное яйцо, *Б* — из многолетнего ила, *В* — начало развития, *Г* — пустая оболочка; *Д* — *Brachionus calyciflorus*; *Е*, *Ж* — *Keratella quadrata*: *Ж* — с эмбрионом перед вылуплением; *З* — *K. cochlearis macracantha*; *И* — *K. irregularis*; *К* — *Brachionus diversicornis*; *Л* — *Notholca acuminata*; *М*, *Н* — *Anuraeopsis fissa*; *О* — *Pompholyx sulcata*; *П* — *Notholca squamula*; *Р* — *Kellicottia longispina*; *С* — *Conochiloides natans*; *Т* — *Conochilus unicornis*; *У* — *Collotheca mutabilis* (*А—Н*, *П—У* — по Никикову, 1961; *К—М* — по Фадееву).

1 — крышечка; *2* — прикрепительный стебелек.

(Various rotifer resting eggs, from Kutikova, L.A. 1970.Rotifers of the USSR. Fauna USSR, 104. Akademia Nauk, Leningrad. 744 pp.)

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Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755
U.S.A.

Editor:
John J. Gilbert

I. Additions to the List of Rotifer Investigators with their mailing addresses and research interests.

James Bricker
Biological Station
Douglas Lake
Pellston, Michigan 49769
U.S.A.
Zooplankton of Lake St. Clair, U.S.A. Rotifer population dynamics of southern Lake Huron

John S. Carter
Environmental Laboratories
Route 3, Box 90
Huntersville, North Carolina 28078
U.S.A.
General ecology of both limnetic and littoral rotifers. Taxonomy and identification keys. Productivity, life histories, etc. Correlation of structure and function of trophi. Effects of thermal stress upon individuals and populations.

M.V.S.S.S. Dhanapathi
Department of Zoology
D.N.R. College
Bhimavaram - 534 202
Andhra Pradesh
INDIA

Joy Grafton
Department of Ecology and Evolution
State University of New York at Stony Brook
Stony Brook, New York 11794
Rotifer culture and feeding

Douglas Grothe
U.S. Environmental Protection Agency
1819 West Pershing Road
Chicago, Illinois 60609
U.S.A.

James R. Litton, Jr.
Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755
U.S.A.
Effects of tocopherols on rotifers. Polymorphism in rotifers. Ecology of freshwater and marine interstitial rotifers.

P. Chandra Mohan
Department of Zoology
Andhra University
Waltair, INDIA 530003

Jens Petter Nillsen
Zoological Institute
University of Oslo
Blindern
Oslo 3
NORWAY
Predator - prey interactions

B. Preisser
Universität Rostock
Sektion Biologie
Freiligrathstrasse 7/8
DDR 25 Rostock
Pop. dynamic studies on rotifers for mass culture as food for the breeding of fishes.

Claudia Melone Ricci
Laboratoria Di Zoologia
Dell Universita
Via Celoria, 10
1 20133 Milano
ITALY
Taxonomy and ecology of Bdelloidea.

R. N. Singla
Department of Zoology
B.N. Chakarvarty University
Kurukshetra - 132119
INDIA
Quantification of food in rotifers, both on dry weight and energy basis. Reproduction and sexual transition in rotifers.

Terry W. Snell
Department of Biology
University of South Florida
Tampa, Florida 33620 U.S.A.
Rotifer population dynamics. Genetics of rotifer populations. Genetic consequences of a parthenogenetic life history. The adaption of rotifer populations to seasonal variations.

Peter L. Starkweather
Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755
U.S.A.
Rotifer feeding

T. R. Venkatesh
Department of Biological Sciences
Birla Institute of Technology and Science
Pilani 333031
INDIA

Evelyn Vollrath
Hochmeisterstrasse 2
78 Freiburg
BRD
Ecological studies on sessile rotifers.
Parasitological problems in rotifers.

Penny J. Wade
McMaster University
Department of Biology
1280 Main Street West
Hamilton, Ontario L8S 4K1
CANADA
Relationship between the distribution of rotifers and that of plankton fractions, bacterial populations and particulate organics.

II. Changes in Previous Listings

Rama Chengalath
Canadian Aquatic Identification Centre
National Museums of Natural Sciences
Ottawa, Ontario
CANADA KIA OM8

Raymond D. Dillon
Department of Biology
The University of South Dakota
Vermillion
South Dakota 57069 USA

Anna Hillbricht-Ilkowska
Department of Hydrobiology
Institute of Ecology, Polish Academy of Sciences
Dziekanow Lensy
05 - 150 Lomianki
POLAND

Robert Keen
Kansas State University
Division of Biology
Manhattan, Kansas USA

Marcia K. Kosmerchock
Limnologisch Laboratorium
Universiteit Van Amsterdam
Dierfysiologisch Instituut
Kruislaan 320
Amsterdam
THE NETHERLANDS

Edward Maly
Department of Biology
Concordia University
Sir George Williams Campus
Montreal, Quebec H3G 1M8
CANADA

R. George Michael
Department of Zoology
North - Eastern Hill University
Nongthymmai, Shillong - 3
Meghalaya
INDIA 793003

Iain G. Munro
Bromley College of Technology
Rookery Lane
Bromley BR 2 8HE
ENGLAND

J. V. Reed
43 Hillview Road
Canterbury
Kent, ENGLAND

Robert L. Wallace
Department of Zoology
University of Washington
Seattle, Washington 98195 USA

James E. Vancil
1409 Barcelona Drive
Knoxville, Tennessee 37919 USA

Christian Zimmerman
Biology Department
University of Calgary
Calgary, Alberta T2N 1N4
CANADA

S. M. Das
Aloka Niwas
T. G. New Civil Lines
Lucknow
INDIA

III. Notices and Notes

1. The First International Rotifer Symposium was held between 21 and 26 September 1976 at the Biological Station of the Austrian Academy of Sciences, Lunz am See, Austria. The symposium was attended by 38 investigators from 15 countries. In addition to the ten invited review papers, 37 shorter papers were contributed. The meeting was extremely enjoyable and informative. Everything was superbly organized by Dr. Agnes Ruttner-Kolisko; also she, her husband Dr. Ruttner, the entire staff of the Biological Station, and the Government of Austria were most gracious, helpful, and generous hosts.

Since this first rotifer symposium was such a success, there was a general feeling that there should be a Second International Rotifer Symposium in several years. Suggestions for the location and date for this symposium could be sent to the editor of Rotifer News and will be most welcome.

A list of participants and the scientific program of the symposium at Lunz am See are presented below. Negotiations for publishing the proceedings of the symposium are underway. Dr. C. E. King has kindly agreed to serve as editor and expects to have all of the manuscripts ready for publication by January 1977.

Participants

Anderson, R.S. - Canada
Buchner, H. - Germany
Clément, P. - France
Coussement, M. - Belgium
Dartnall, H.J.G. - U.K.
Dhanapathi, M.V.S.S.S. - India
De Henau, A.M. - Belgium
Donner, J. - Austria
Dumont, H.J. - Belgium
Edmondson, W.T. - USA
Gallup, D.N. - Canada
Gannon, J. - USA
Gilbert, J.J. - USA
Green, J. - U.K.
Guiset, A. - Spain
Herzig, A. - Austria
Hofmann, W. - Germany
King, C.E. - USA
Koste, W. - Germany
Kronsteiner, E. - Austria
Markic, M. - Yugoslavia
Miracle, M.R. - Spain
Nilssen, J.P. - Norway
Pivoda, B. - Austria
Pejler, B. - Sweden
Pourriot, R. - France
Pozuelo, M. - Spain
Preissler, A.K. - Germany
Ricci, C.M. - Italy
Ruttner-Kolisko, A. - Austria
Salt, G.W. - USA
Schaber, P. - Austria
Scott, J.M. - U.K.
Snell, T.W. - USA
Stemberger, R. - USA
Sudzuki, M. - Japan
Wallace, R.L. - USA
Wurdak, E.S. - USA

Scientific Program

21 September
20.00 Informal meeting

22 September
8:30 Opening session - A. Ruttner-Kolisko

9.00 - 10.30 Review by J. Green: Sampling devices; impact of sampling technique and sampling frequency on the apparent distribution pattern.

Comment - Comparison of sampling methods, triplicate sampling (A. Ruttner-Kolisko)

11.00 - 13.00 Review by M. R. Miracle: Distribution in space and time, migration and patchiness.
Comments - Multivariate analysis of planktonic rotifer distribution in Lake Huron (R. Stemberger, J. E. Gannon)
Do rotifers show "avoidance of the shore"? (K. Preissler)
Migration of planktonic rotifers in the Lunzer Obersee (B. Pivoda)
Distribution of sessile rotifers; the adaptive significance of substrate choice by sessile rotifer larvae (R. L. Wallace)

15.30 - 17.30 Review by W. T. Edmondson: Population dynamics, secondary production, biomass estimation.
Comments - A procedure of calculating production of rotifers with a unimodal phenology (H. Dumont)
Suggestions for biomass calculations of rotifers (A. Ruttner-Kolisko)
Antarctic freshwater rotifers (H. Dartnall)

23 September
8.30 - 10.30 Review by W. Hofmann: The influence of abiotic environmental factors on rotifer population dynamics.
Comments - Effect of thermal effluents upon egg production of planktonic rotifers (D. N. Gallup)
Die Rolle der Rotatorien im Saprobiensystem (J. Donner)
Population dynamics of rotifers in the Lunzer Untersee and Lunzer Obersee (A. Ruttner-Kolisko)
10.30 - 13.00 Excursion to the Lunzer Obersee

15.30 - 17.30 Review by H. Dumont: Biotic causes of population dynamics -- food, predators, parasites.
Comments - Food preferences in 5 species of *Asplanchna* (G. W. Salt)
Diet variation in *Asplanchna* and *Ploesoma* (A. Guiset)
Some effects of enclosure on congeneric species of rotifers (M. R. Miracle)
Rotifer populations in mountain lakes relative to the species of copepods and fish present (R. S. Anderson)
The effect of *Plistophora asperospora* on *Conochilus unicornis* in the Lunzer Untersee (A. Ruttner-Kolisko)
Epidemiology in rotifers (M. R. Miracle)

24 September
8.30 - 10.30 Review by J. J. Gilbert: Reproduction -- types, time of determination, effect of external factors, polymorphism.
Comments - Rotifer reproduction under controlled experimental conditions (J. M. Scott)
Male production in seawater-cultured *Brachionus plicatilis* (M. Pozuelo)
Comparison of mictic reaction between 3 clones of *Notommata copeus* (R. Pourriot, P. Clément)
Dwarfing in tropical crater lakes (J. Green)
Ageing and mictic reaction in *Brachionus* (R. Pourriot, C. Rougier)

Amphoteric reproduction in a population of Asplanchna priodonta (A. Ruttner-Kolisko)
Reproduction cycle of Sinantherina socialis (R. Pourriot, P. Champ)

11.00 - 13.00 Review by C. E. King: Genetics of reproduction, variation, and adaptation in rotifers.
Comments - Mechanisms of adaptation; clonal selection (T. W. Snell)
Transmission pattern of the mictic reaction in a clone of Notommata copeus (R. Pourriot, P. Clément)
Effects of cyclical ameiotic parthenogenesis on gene frequencies and effective population size (C. E. King)

15.00 - 17.30 Review by P. Clément: New morphological findings, ultrastructure research, phylogenesis.
Comments - Fine structure of the resting eggs of Asplanchna sieboldi and Brachionus calyciflorus (E. Wurdak)

25 September
8.30 - 10.30 Review by B. Pejler: General problems of rotifer taxonomy and global distribution.
Comments - Classification based on the male (M. Sudzuki)
General distribution of planktonic species in Spanish reservoirs (A. Guiset)
On the distribution of the rotifer species Brachionus calyciflorus in India (M. Dhanapathi)
Some puzzling problems in the taxonomy of Brachionus and Keratella (M. Sudzuki)
Some new data on variation in planktonic species (A. Guiset)

11.00 - 13.00 Review by R. Pourriot: Culture technique, food and feeding habits, behavior.
Comments - Feeding in Brachionus (P. Starkweather, J. Gilbert)
Experience with rotifer cultures based on Rhodomonas (B. Pejler)
Cannibalism in Asplanchna (J. Gilbert)
The phototaxis of Notommata copeus and Brachionus calyciflorus (P. Clément)

2. Research notes by R. L. WALLACE

a) There is a population of Asplanchna multiceps (Schrank 1873) in Green Lake (Seattle, Washington), a highly eutrophic lake within the city limits of Seattle. Preliminary feeding experiments have indicated that A. multiceps feeds entirely on chydorids, totally avoiding Bosmina of approximately the same size. Hungry Asplanchnopus rarely (if ever) attempt to capture or feed on any other prey when offered. Prey species included: Paramecium, rotifers (Keratella, bdelloids), Bosmina, colonial algae, young Asplanchnopus, and ostracods. Further experiments will be conducted.

b) There is a population of Collotheca gracilipes in a small pond (Seattle, Washington) which was almost exclusively limited to the anatomical undersurfaces of Elodea leaves, although three other macrophytes were present: Myriophyllum, Lemna, Nymphaea. Substrate selection experiments indicate C. gracilipes larvae select the undersurface of Elodea leaves.

3. News items on rotifers from M. SUDZUKI

A bibliography of some rotifer papers and some information on rotifer investigators and rotifers have been published in the following reference:

Sudzuki, M. 1974. Current topics for research studies on Protozoa libera, Gastrotricha, Rotatoria and Tardigrada during 1960-1973. Obun Ronso, Nikon Daigaku, Tokyo 5:151-167.

4. Research of J.C. MAKAREWICZ

In his doctoral dissertation (1975, Cornell University, Ithaca, New York USA) on the zooplankton of Mirror Lake, New Hampshire, USA there is information on the production, vertical migration, niche diversification, and seasonal distribution of rotifers. The rotifers studied were: Keratella cochlearis, K. quadrata, K. crassa, K. taurocephala, Kellicottia bostoniensis, K. longispina, Asplanchna priodonta, Polyarthra vulgaris, Conochilus unicornis, and Conochiloides dossuaris. Some of these studies have been briefly described (Makarewicz, J.C. and G. E. Likens, 1975, Science 190:1000-1003).

5. Research of J.E. VANCIL

The abstract of his doctoral dissertation (1975, University of Tennessee, Knoxville, Tennessee U.S.A.) is presented below:

Acute toxicity of 2,4,5-T to three species of limnetic rotifers (Keratella cochlearis Gosse, Keratella americana Carlin, and Brachionus angularis Gosse) and associated life history information --

Toxicity (lethal effects) of 2,4,5-T to limnetic rotifers was measured. Technical 2,4,5-T and six commercial herbicide formulations containing 2,4,5-T derivatives were each assayed against one or all of the species: Brachionus angularis, Keratella cochlearis, and Keratella americana. The 2,4,5-T derivatives were its triethylamine salt, butyl ester, isooctyl ester, and N-oleyl-1,3-propylene-diamine salt. Life history information was also determined. These studies were undertaken to assess the short-term hazard from 2,4,5-T and to obtain baseline information about the duration of life stages and vitality of the rotifers.

The data were collected by making observations of the rotifers at close time intervals while they were contained in concavities of transparent flex vinyl titration plates. Group responses to test conditions were monitored. A complex, chemically defined medium was used with the rotifers and the algae they were fed. Brachionus angularis and Keratella americana received Chlorella vulgaris.

Keratella cochlearis was fed with Cryptomonas ovata palustris. All determinations were carried out under a continuous light regime at 20.0 ± 1.0° C.

Some toxicity determinations were made with rotifers supplied with algae at controlled levels, but in the majority of determinations the rotifers were not fed unless organic components of the medium afforded some nutrition. Toxicity was estimated as herbicide concentrations in mg/l corresponding to median mortality at standard intervals of 12, 24, 48, 72, and, in some cases, 96 hrs.

Nearly all of the toxic effects of the levels of herbicides giving determinations for 12 and 24 hrs were expressed by 48 hrs. Toxicity was not directly related to content of 2,4,5-T and other ingredients of the commercial formulations had a toxic effect. Algae given as food influenced toxicity of a triethylamine salt formulation to Brachionus angularis. At a lower algal concentration toxicity was increased. At double the lower amount it was reduced. Median lethal concentrations for 48 hours ranged from over 100 mg/l for a triethylamine salt formulation to 0.11 mg/l for one containing the N-oleyl-1,3-propylene-diamine salt. The species did not display much difference in sensitivity to 2,4,5-T. The sensitivity was rather similar to that reported for fish. Bioassay in the intended receiving waters before use of the more toxic 2,4,5-T forms is recommended as it has been for fish.

Mean egg development time was about one day for the three rotifer species. Mean survival with deprivation of algae ranged from about 3 to about 7 days. Mean longevity of rotifers fed with algae ranged from about 6.25 to about 14.5 days. The average number of eggs produced and hatched per female ranged from 2.6 to 7.6. Mean immature period ranged from about 1.5 to about 3.75 days. Mean generation time ranged from about 2.5 to about 5 days. Egg development time, generation time, and interval between eggs were more variable than reported in the literature for other species.

6. Research interests of J. DONNER

He is now studying the saprobiological state of the Danube River in Austria with special attention given to the rotifers.

7. S.M. DAS and S. AKHTAR submitted the following note entitled: "A survey of Rotifers of Kashmir with some new records of Palaearctic Genera and Species."

Indian rotifers have been reported by Hutchinson (1934), Brehm (1950), Pasha (1961), George (1963), Arora (1962, 1966), Vasisht (1967, 1969, 1971), Nayar (1968), and Das (1969, 1970, 1971). Edmondson and Hutchinson (1934), Hora (1953), and Das (1971) are the only reports of Kashmir Rotifera.

Rotifers were collected weekly with a 60-mesh plankton net. The collections were brought to the laboratory from various localities in specimen tubes, narcotised, and then killed, fixed and stained. The systematic records were prepared after careful observations made under high and low power microscopes. The following table shows the rotifers recorded from different localities.

Genus	Species	Locality	Recording Author
1. Brachionidae			
Brachionus	bidentata	Dal, Wular Lakes	Das (1966)
Brachionus	angularis	Wular Lake	Akhtar
	quadridentata	Nagin Lake	"
	calyciflorus	Wular Lake	"
	diversicornis	Alpathar Lake	Das
Macrotrachella	quadricornifera	Dal, Wular Lakes	"
Proales	decipiens	"	"
Mniobia	cricinnata	"	"
Philodina	roseola	"	"
Adineta	vaga	"	"
Eosphora	najas	"	"
Rotaria	Spp	Dal Lake	"
Chromogaster	Spp	"	"
Keratella	quadricornis	"	Akhtar
	cochlearis	Neelnag Lake	"
	quadrata	Manasbal Lake	"
	valga	Nagin Lake	"
Platyias	dalensis	Dal Lake	"
Trichotria	tetractis	"	"
Euchlanis	dilatata	Wular Lake	"
	menata	"	"
Colurella	tricuspidata	Dal Lake	"
Lepadella	rotella	Wular Lake	Das
Trichotria	tetractis	Kounsarnag Lake	"
2. Lecanidae			
Lecane	luna	Kounsarnag Lake	"
Monostyla	bulla	Wular Lake	"
	closterocerca	"	"
	crenata	"	"
	lunaris	"	"
	quadridentata	Dal Lake	"
	brevispina	Manasbal Lake	"
3. Synchaetidae			
Polyarthra	vulgaris	Dal, Wular Lakes	Akhtar
Synchaeta	oblonga	"	"
	pectinata	Gulmarg Pond	Das
4. Testudinellidae			
Filinia	longiseta	Dal, Wular Lakes	Akhtar
	terminalis	Kounsarnag Lake	Das
5. Gastropidae			
Ascomorpha	saltans	Dal, Wular Lakes	"
	eucaudis	"	"
	brightwelli	"	"
Gastropus	hyptopus	Gulmarg Pond	"

6. Trichocercidae

Trichocerca	longiseta	Kounsarnag Lake	Das
	rattus	Wular, Dal Lakes	Akhtar
	similis	"	"
	bicornis	"	"
	cristata	"	"

7. Asplanchnidae

Asplanchna	priodonta	Wular, Dal Lakes	"

8. Floscularidae

Floscularia	ringens	Gulmarg Pond	Das
	conifera	"	"

9. Conochilidae

Conochilus	unicornis	Dal, Nagin Lakes	"

Elevations of lakes:

1. Alpathar, Kounsarnag - above 4000 m

2. Dal, Nagin, Wular, Manasbal - between 1600 and 2000 m

The authors have recorded 9 families and 48 species of rotifers from high and low altitude Kashmir lakes, ranging from 1600 m to 4500 m. Many of the species are confined to high altitude lakes, while some inhabit only the lower Dal and Wular lakes.

The cold-water, high-altitude rotifers are:

Brachionus quadridentata, Keratella cochlearis, K. valga, K. quadrata, Lecane luna, Synchaeta pectinata, Filinia terminalis, Gastropus hyptopus, Trichotria tetractis, Trichocerca cristata, T. bicornis, T. similis, T. rattus, Floscularia conifera, and F. ringens; all of these are new records for Kashmir. The high altitude Filinia terminalis was, however, recorded by Edmondson and Hutchinson (1934) from Togom in Tibet. Trichotria tetractis is recorded for the first time from the India-Kashmir region.

The genera Macrotrachella, Proales, Philodina, Adineta, Eosphora, Euchlanis, Colurella, Lecane, Monostyla, Gastropus, Floscularia, and Conochilus are rare or unrepresented in the rotifer fauna of the plains of India. These genera may also be considered as Kashmir genera representing palaearctic elements in the rotifer fauna of Kashmir.

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8. Notes from the editor of ROTIFER NEWS

a) The amount of material submitted to me for inclusion in the newsletter is rapidly decreasing and is now really minimal. If our newsletter is to be useful, there must be greater participation. Please send more items.

b) Please be sure to send me your reprints and literature citations of published studies not yet available in printed form. Also, I hope more individuals will send me their complete bibliographies of publications relating to rotifers. When submitting such complete bibliographies, please use the format of reference citation used in the "Recent Literature" section of the newsletter.

c) Please send suggestions for: i) new types of material to be included in the newsletter, and ii) ways in which the newsletter might be of more service to more people.

d) Please be sure to notify me of any mistakes or spelling errors that I have made in your names or addresses. I plan to compile a new and complete list of the names and addresses of rotifer investigators for the next issue of the newsletter.

e) Please encourage colleagues and acquaintances who work with rotifers but do not currently receive our newsletter to send me their names, addresses, and research interests; I will then send them the present as well as back issues of Rotifer News and also add the information they send to the next issue.

IV. Recent Literature

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