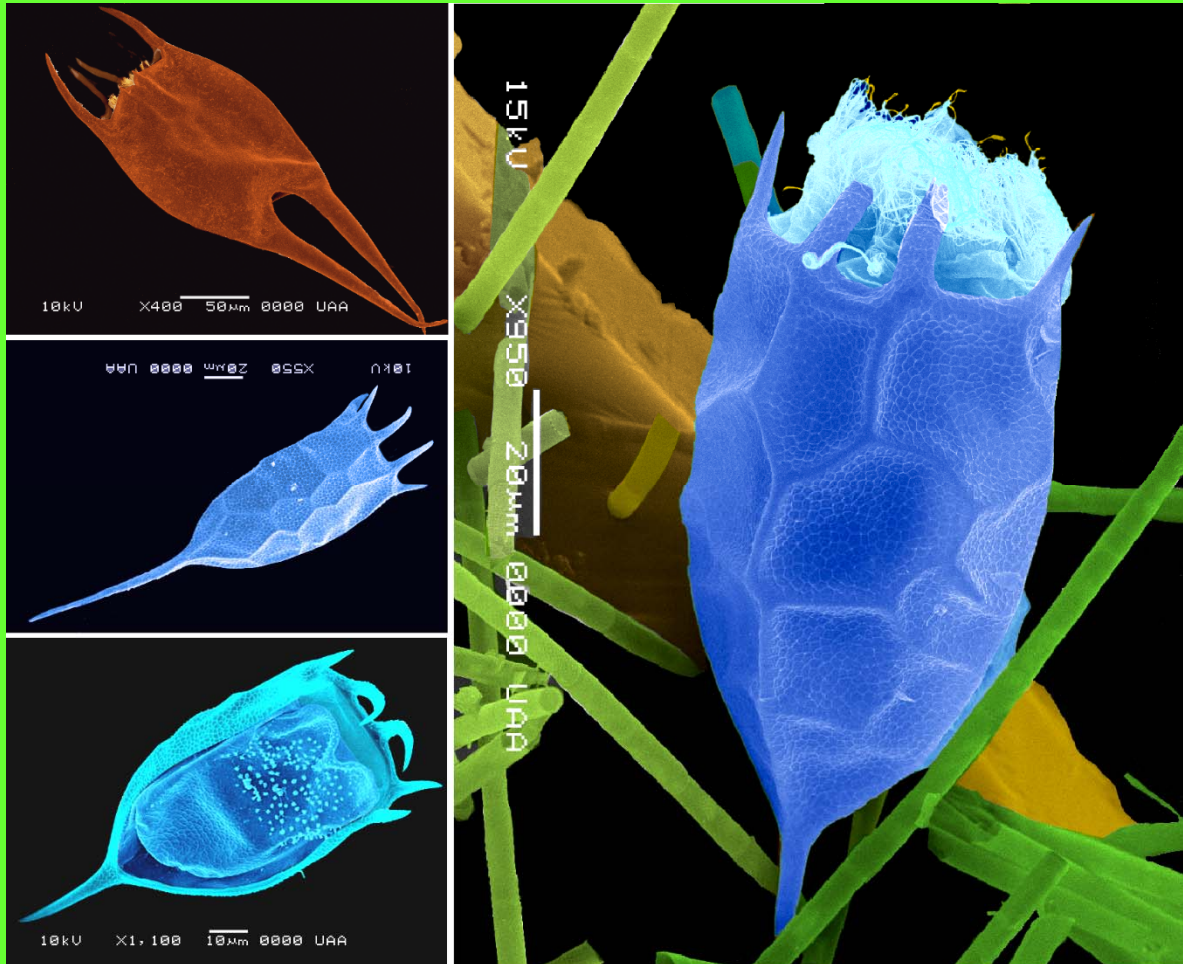


Rotifer News

A newsletter for rotiferologists throughout the world



SEM microphotographs of some rotifers after a special *Photoshop* treatment.
Credit: Silva-Briano & Adabache-Ortiz (see p.23 in this issue).

Issue 38: January 2023

ISSN 1327-4007

In this issue:

Former Editors....
Amateur
Book Reviews
Occasional Forum.....
Book-Writing.....
Announcements.....
Many more.....

Produced at the

*National Autonomous University of
Mexico (UNAM)-Faculty of Higher
Studies (FES) Iztacala, Mexico*

Editorial: *New features in Rotifer News (January 2023)*

Rotifer News (RN) has witnessed several remarkable changes since the initiation of the newsletter in 1973. In this issue some more features have been added. Firstly, the RN irreversibly recognizes the hard work rendered by the predecessors to propel the newsletter into the global community of rotiferologists. This item has been added with the view of eye-opening for some pay-per-publication journals which show ephemeral gratitude to the former editors. Once such a publisher replaces an existing editor by a puppet-editor, the history of the previous editor(s) is wiped out. The experiences obtained by the former editors of RN must be shared by the future editors and thus, in this issue, some of these details are included. Secondly, to meet the growing demands of visibility standard works (other than research papers), the item *Book Review* has been added to this issue and will continue to the future issues of RN. Book reviews will only be done if the authors specifically indicate their acceptance for reviewing in RN. In this issue two items related to Book-Reviews have been included. The third feature is the inclusion of email addresses of Editorial Board Members so that the users of RN may immediately contact them, if need arises.

VRC has been highly successful in attracting both talented and diverse presentations of different areas of rotifer research. One of the unique features of VRC is that it carries abstracts of presentations made during the virtual meetings. In order to include, as many enthusiastic

rotiferologists as possible, the VRC is now open registration of new workers. The VRC is being organized by S. Nandini. Details appear elsewhere in this issue.

Some photos of participants of Rotifera XVI have been included in this issue. Since these make the file heavy, low intensity photos have been chosen. Most photos have been supplied by Sergio González Gutiérrez and Maria Špoljar. A few others were obtained from screen-shots of Zoom Sessions.

Rotifer News continues to provide updated information on the theses and dissertations with the theme of rotifer research. Some information on the theses from Mexican Universities on this topic collected by Cesar Alejandro Zamora Barrios has been included in this issue. Further additions appear from time to time.

Book writing is an art that requires both a comprehensive understanding and a deep abiding love of the subject. Unfortunately, giants in scientific research most often contribute to their field by writing articles or book chapters rather than complete books. This is particularly evident in Rotifera where only a handful of books are available compared to thousands of articles. Further, books on rotifer research are mostly based on taxonomy; this started with Hudson & Gosse's (1886) and continued more recently with Koste (1978). With the exception of a few examples (e.g. Ruttner-Kolisko 1974, Wallace et al. 2006), few books cover their ecology in any detail. There are many reasons

for the lack of initiative among rotiferologists to write books rather than writing individual articles. TJ Pandian who authored more than a dozen books in recent years, lists some of them and shares his experiences in book writing in this issue. Some of them are equally applicable for writing any scientific book. It is hoped that Pandian's article inspires world rotiferologists to balance their effort in contributing to book writing, as well as publishing research articles.

However, some of them are sent out to reviewers for improving the manuscript presentation and acceptability for RN. The invited manuscript submitted by TJ Pandian has been reviewed by RL Wallace. It has been included in this issue.

The present number of RN marks the first issue for the year 2023. *We wish you a very happy New Year 2023.*

S.S.S. Sarma
Editor

Notes and News

Change of contact address

Russell J. Shiel of Australia has informed that his e-mail address at *adelaide.edu.au* is now closed. For those who would like to contact him, he has a website:

<https://rjshiel.com>

In addition, the following two e-mail accounts are available to contact him:

Email 1: **russell@rjshiel.com**

Email 2: **rotifer4561@gmail.com**

International Course on Applications of Freshwater Zooplankton (May 27-31, 2022): A Report

An international course on *Applications of Zooplankton in Aquaculture and Ecotoxicology* and as Generally, manuscripts submitted to Rotifer News are not peer-reviewed.

Indicators of Water Quality was organized during May 27 to 31, 2022, by a Peru-based training company, **FitoLand E.I.R.L.** (Ancash region, Chimbote District). Biologist Sheyla Lopez Saravia and her technical team made it possible to organize this course in which participants from different parts of the world were connected via the Zoom platform (see Screen shots 1 and 2).

This course had as two resource persons from Mexico with wide professional recognition: Dr. S. Nandini and Dr. S.S.S. Sarma, professors at the National Autonomous University of Mexico, Faculty of Higher Studies, Iztacala (Tlalnepantla, State of Mexico).

The thematic content of the course included the study of zooplankton (rotifers, cladocerans and copepods), with emphasis on taxonomy,



Screen-shot 1



Screen-shot 2

aquaculture, ecotoxicology and their use as bioindicators in water quality management. These topics are of utmost importance for the evaluation of the aquatic ecosystems.

The course began on Friday, May 27, with introductory remarks by Sheyla Lopez on the importance of such courses organized by FitoLand. Participants from different countries

(Chile, Ecuador, Mexico and Peru) participated in the course.

At the end of the course, participants viewed it as an excellent opportunity and some comments include: "Good content, which helped me to remember concepts, mainly about ecology", "a lot of information was shared in a short time, future, in-depth studies can help us put these into

practice", "Very good, we like the simplicity of the speakers, they make everything look so easy".

Fitoland E.I.R.L. will soon launch further courses related to this topic and other areas of biology including marine ecosystems of the world.

Interested participants are invited to visit our *Facebook* page **Fitoland Peru** and our social networks *Instagram* and *Twitter* **@Fitoland E.I.R.L.** We will be happy to answer your queries.

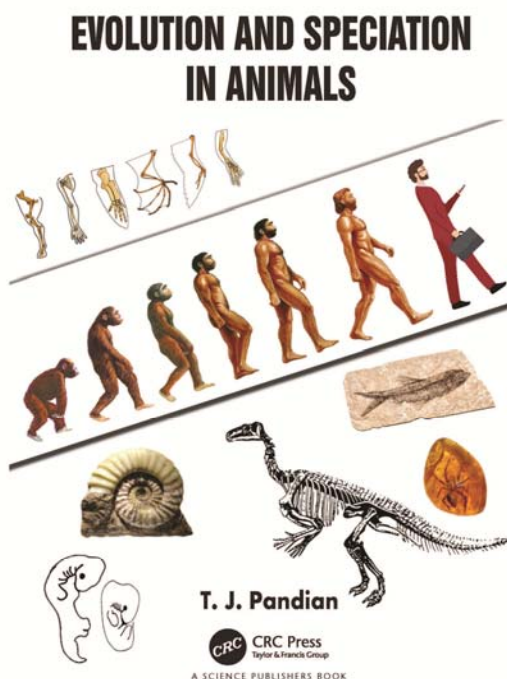


Sheyla Briggitt López Saravia

Email: lopezsaravia5@gmail.com

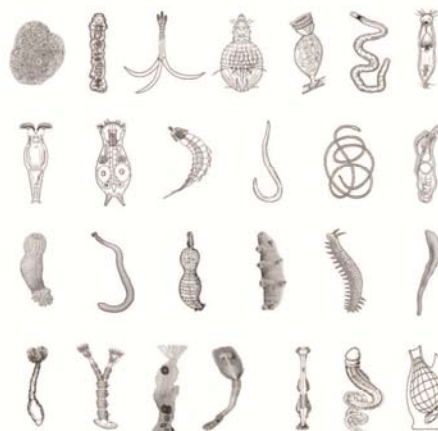
Recent volumes

Book chapters with emphasis on Rotifers



Series *Reproduction and Development in* *Aquatic Invertebrates* *Volume 6*

Reproduction and Development in Minor Phyla



T. J. Pandian

 **CRC Press**
Taylor & Francis Group
A SCIENCE PUBLISHERS BOOK

Pandian TJ 2021 *Evolution and Speciation in Animals*. CRC Press, Boca Raton, FL, USA. Pp 332.

Pandian TJ 2021 *Reproduction and Development in Minor Phyla*. CRC Press, Boca Raton, FL, USA. Pp. 299.

Source: Author

Book Review: *Pandian TJ 2021*
Reproduction and Development in
Minor Phyla. Reproduction and
 Development in Aquatic
 Invertebrates, Vol. 6. CRC Press,
 Boca Raton, FL, USA. pp 320.

Given the impressive list of scientific awards awarded to Professor T.J. Pandian, it is not surprising that he has taken on the monumental task of reviewing reproduction and development in the minor phyla. This work represents the 6th contribution to the series entitled Reproduction and Development in Aquatic Invertebrates. The taxa covered in this volume include, in this order, Placozoa, Mesozoa, Myxozoa, Loricifera, Cycliophora, Nemertea, Gnathostomulida, Rotifera, Gastrotricha, Kinorhyncha, Nematoda, Nematomorpha, Acanthocephala, Priapulida, Sipuncula, Echiura, Tardigrada, Onychophora, Pantastomulida, Entoprocta, Phoronida, Bryozoa, Brachiopoda, and Chaetognatha. The concluding chapter, New findings and highlights, provides an exciting comprehensive compilation of all the groups: one that offers a refreshing insightful synopsis of reproduction and development in all these animals.

Each chapter follows a general plan that includes topics such as Introduction, Taxonomy and distribution, Reproductive biology, Life cycles, Endocrines and differentiation, and Regeneration and cloning. But, of course, given that the information pool for these taxa varies so widely, the content of each chapter often diverges from this general plan. At the end there is a single chapter that provides a comprehensive list of references. The

references list includes >575 publications and covers the classical contributions, as well as the recent works. The work ends with three extensive indices: (1) Authors cited, (2) Species noted, and (3) Subjects covered.

While I am not sure that nematodes qualify as a minor phylum, I recommend that this book should be read by candidates for the Ph.D. degree working on the reproduction and development in any of these phyla. Actually, anyone looking to understand reproduction and development in rotifers should read the entire work to widen their knowledge of this complex field.

Of course, because it is beyond the scope of a review in *Rotifer News* to consider in detail his entire work, I will provide a more detailed review for only Chapter 9, Rotifera.

The chapter on rotifers follows the general pattern of many of the other chapters, but with coverage that befits the idiosyncrasies of our beloved taxon: Introduction, Taxonomy and Life Style, Eutelism and Tissue Types, Reproduction, Life Cycle[s], Fecundity and Mixis, Starvation and Rejuvenation, Rotiferan Pseudocolonies, Dormancy and Resting eggs, and Sex in Bdelloids.

The Introduction is rather short, but this is understandable given the coverage presented in both classic and recent works. The section on Taxonomy and Life Style is also rather brief, but much of the details that could be covered here are offered in subsequent sections.

The sections entitled Eutelism and Tissue Types, Reproduction, Life Cycle, and Fecundity and Mixis cover, in some detail, the focus of the entire work. In the section of life cycles Pandian reviews embryonic development; here he provides a clear message — we do not know enough about development in rotifers.

The curious topic of Starvation and Rejuvenation is given brief coverage focusing on the topic of fecundity and survival. What we need in this field is a comprehensive understanding of rotifer metabolomics, but I do not know whether that is possible given our current understanding of rotifer physiology. [Perhaps details of that topic are held as proprietary information by the commercial aquacultural world.]

Colony formation in species (e.g., *Conochilus unicornis*, *Floscularia conifera*, and *Sinantharina socialis*) are reviewed in the section entitled Rotiferan Pseudocolonies. [NB: Pandian applies the term pseudocolony in the strictest definition for a colonial invertebrate. That is, there must be intimate and organic

connections between individuals, as is found the zooids of Bryozoans. In other fields of biology use of the term colony is less restrictive: e.g., a colony of king penguins (Weimerskirch et al. 2018).]

The section on Dormancy and Resting Eggs also highlights how little we know about them beyond tolerance to stressful conditions, something of their density in sediments, and their surface characteristics. I wish more was presented on what we do know of the shell characteristics.

The final section, Sex in Bdelloids, provides a brief overview of the enigma of bdelloid reproduction.

Literature cited

Weimerskirch H, Le Bouard F, Ryan PG, Bost CA 2018 Massive decline of the world's largest king penguin colony at Ile aux Cochons, Crozet. Antarctic Science 30(4): 236–242.

Robert L. Wallace

Ripon College, WI, USA

Email: wallacer@ripon.edu

Book Review: *Pandian TJ 2021 Evolution and Speciation in Animals*, CRC Press, Boca Raton, FL, USA. pp 346. ISBN 9781032009193

Rotifers are often mentioned in the book *Evolution and Speciation in Animals* (Taylor and Francis) by T. J. Pandian, a renowned professor, previously worked at Madurai Kamaraj

University in Tamil Nadu, India. This lucid text covers several aspects of the subject with numerous examples from several habitats. The chapters are divided into three broad categories, environmental factors, life history strategies and the importance of fossils in the study of evolution and speciation, conservation strategies, and the effects of climate change. Another interesting aspect of the text

is the extensive use of old and recent literature, introducing the reader to several terms not used frequently these days.

Several aspects and relations of rotifers with other invertebrates have been well discussed, beginning with the number of species known and their distribution in different habitats. Characteristics, such as eutely, are compared with other invertebrates providing valuable but rarely discussed information. There is also information on the number of species with direct and indirect lifecycles among the animal phyla; all rotifers have direct life cycles. Mitotic and meiotic parthenogenesis among different phyla, and spermatophore formation in rotifers, rarely discussed in general texts, has been elaborated. The comparative analyses of the body size of rotifer males and females and the reproductive strategies of rotifers vis-a-vis other invertebrates is quite interesting. The rarity of parasitism in rotifers has also been mentioned,

although specific examples are lacking. Comparisons on the species diversity among sessile taxa and their mode of feeding is quite interesting and well presented. Diapause, the author states, is first observed in rotifers among the phyla on an evolutionary scale. The phenomenon is more common in organisms in epicontinental waters than in marine habitats. The text also discusses the impact of abiotic factors on speciation and states that temperature is one of the most important. The wide range of temperature tolerance among rotifers is also discussed. Information on filter feeding by rotifers is presented; the fact that they can ingest food equivalent to their body weight almost ten times a day helps us understand the vital role of rotifers in aquatic food webs.

S. Nandini

FES-I, UNAM, Mexico

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Occasional Forum 1

A rose by any other name

As indicated in RN 35 p. 2, certain topics of general interest to all rotiferologists are often discussed through email communications, which may not be available for other interested readers. Therefore, it has been decided to make it open to the global rotiferologists to comment on

issues related to rotifer nomenclature and other related issues.

In this issue an item about family names is pondered. Readers who wish to add to this discussion or any other theme of interest may send an email to: rotifernews@gmail.com — Editor

Microcodonidae or Microcodidae?

Introductory Note from RLW — *The following email thread was started some time ago (2018). It revolves*

around the spelling of the family Microcodonidae. These exchanges have been edited slightly to correct typographical errors and to format the individual emails for easier reading.

Spoiler-alert: the Rotifer World Catalog now records the family name as Microcodonidae. For those interested in the details of determining family-group names, one may consult Chapter 7 Formation and Treatment of names in Ride, W.D.L. et al. (1999) International Code of Zoological Nomenclature, 4th edition.

Just to confuse you, here is a little history beyond what is discussed in the email thread. Bartoš (p.816)^[1], Edmondson (p.438)^[2], and Pennak (p.185)^[3] use Microcodonidae. Koste (p.523)^[4], Kutikova (p.434)^[5], and Rudescu (p.334)^[6] use the spelling of Microcodinidae. Bielanska-Grajner et al. (p.90)^[7] and Wallace et al. (p.244)^[8] use Microcodidae.

The name of this family really does exemplify Juliet's lamentation

"What's in a name? That which we call a rose / By any other name would smell as sweet." — The Bard.

Also Pennak records the trophi as forcipate.

The email thread follows.

As a Ph.D. student in 2018, I was examining the functional diversity of rotifers from the Xochimilco lake. I started reviewing the types of trophi, and when I found something curious, a series of emails were sent between senior researchers. After reading this, I was amazed, surprised, and excited about how they resolved a problem that I thought was trivial at that time.

My recommendation for young researchers is to write to the authors of articles when doubts arise in daily readings, and they will surely respond as nicely and energetically as they did to me. — **Jiménez Santos MA**

Jiménez Santos MA

June 19/04/2018

to: Fontaneto D & Wallace RL

Hi, I was reading about the families and their trophi and I found something rare: In chapter 4 Rotifera (Fontaneto & De Smet) it is written as Family "Microcodonidae Hudson & Gosse, 1886" with a single genus Microcodon and trophi virgate, but in Ecology and Classification of North American Freshwater Invertebrates is written as "Microcodidae" and in <http://rotifera.hausdernaatur.at/Family/Index/22> the trophi is forcipate, I guess the correct way is Microcodidae but, about the trophi? They look like forcipate, is that right?

Thank you.

Fontaneto D:

Hi Antonio,

I forward your question to Willem and Christian, who have more knowledge on monogononts and have seen these animals. Microcodidae should be correct spelling, I think. Unless something has been published that prefers the other spelling.

Cheers,

Diego

Jersabek C:

Hi Diego, Antonio,

The correct original spelling, as used by Hudson & Gosse (1886) is Microcodidae. The confusion originates from Harring (1913), I believe, when he used the name Microcodonidae in his Synopsis.

On the trophi, 'forcipate' comes from the original diagnosis, but much has changed since about our trophi-concepts, it certainly is not forcipate, as we understand the term today. Willem De Smet in his revision of family Microcodidae writes in the diagnosis: "Incus virgate, malleus malleate" – hence sort of a mixture. Hope this helps,
Christian

Wallace R:

This could be a topic for one of the IRS15 workshops

De Smet W:

Hi all,
According to the ICZN "Formation of family-group names" 'a family or subfamily name is formed by adding to the stem of the name of the type genus the latinized suffix -idea for a family name and -inae for a subfamily name'. Therefore Microcodonidae seems correct to me.
Yes, as for many many other species, the trophi type is not classifiable univocally into one of the gross major types.
All the best-Wim

Jersabek C:

Hi all,
Gave it a second thought... of course Wim is correct that the family name needs to be formed by adding to the name of its type genus Microcodon. So I must correct what I said earlier, Hudson & Gosse's spelling is an incorrect original spelling. Whether or not such an incorrect spelling must be corrected depends on whether or not the name is in prevailing usage (and then must be maintained, for the sake of nomenclatural stability):

"29.5. Maintenance of current spellings. If a spelling of a family-group name was not formed in accordance with Article 29.3 but is in prevailing usage, that spelling is to be maintained, whether or not it is the original spelling and whether or not its derivation from the name of the type genus is in accordance with the grammatical procedures in Articles 29.3.1 and 29.3.2."

And in the introduction to the Code we find: "12. In most cases an author will be required to maintain the particular spelling in prevailing usage for a name, even if it is found not to be the original spelling; for example, the spellings of family-group names currently in use are to be maintained even if formed from grammatically incorrect stems."

BUT: in this case it seems clear that Microcodidae is NOT in prevailing usage. Harring in his Synopsis actually corrected the name according to nomenclatural rules, and many authors later used yet another name for the family (Microcodinidae). Fontaneto & De Smet were right to finally apply the correctly formed name to the family, I believe.

Perhaps we shall start a family-level LAN to fix all of this? Anyone up for it?
Cheers
Christian

Fontaneto D:

The problem with Microcodon is that it is not a Latin name. The Greek final -on can be considered equivalent to the final -us in Latin.

Thus, if for *Brachionus* the family becomes Brachion-, remove, -us, add -idae = Brachionidae, for Microcodon, if we maintain the equivalence between the greek -on and the latin -

us, it should be Microcod- remove -on, add -idae = Microcodidae. Yet, if we keep the full name Microcodon, then it becomes Microcodonidae.

Nomenclatorial rules are full of ambiguities and pitfalls...

Cheers,

Diego

Jersabek C:

Oh yes. Even more important to have a LAN fixing such issues! No more discussions thereafter.

Segers H:

Hi all,

A few thoughts:

(1) Microcodon may well be formed from the Greek μικρός (mikrós), and Latin codon, from Ancient Greek κώδων (*kódōn* - "mouth of a trumpet"), which would refer to the shape of the animal- and would make sense. In that case the stem is "microcodon", not "microcod". But I'm neither a Latin or a Greek expert...

(2) Agree with Christian that Harring's (1913) argument is sound and I'd therefore prefer Microcodon, and following prevailing use.

(3) On Family-level LAN;

a) Let's see what the species- and genus- level Rotifera LANs give.

b) I am not convinced because:

i) The Family level in nomenclature is, IMHO, rather spurious. Genus & species-level names are used in day-to-day communication of animal organisms in binomials, this is not so for everything above genus level. As there are no rules for everything above Family-

level, why should there actually be rules for Family-level names?

ii) Species level makes sense in an evolutionary context, genus not so much (but is useful in our binominal nomenclature communications system), family is complete balderdash (and is not very useful anyway)

iii) very practical: while preparing my 2002 paper (The nomenclature of the Rotifera: annotated checklist of valid family and genus-group names) it was rather frustrating to find the correct author and date of family-level names, as this is something not many authors bother about so it was quite difficult to find back the original citations (and I'm not sure I found them!). Also, you'll quickly learn that lots of (common) rotifer genus names have at one time or another been used for as stem for a family-level taxon (and mostly not by the most ... how would I put this ... diligent workers).

So, for me and as a very first thought, I'm not convinced the exercise is worth the trouble --- but I'm open to hear other arguments?

All the best,

Hendrik

De Smet W:

Hi all,

Hendrik is hot...

Χώδων also means "small bell" and Ehrenberg 1838, Die Infusionsthierchen... (p. 396) calls *M. clavus* "das Glockenfischen"

Have a nice week-end!

Wim

Jersabek C:

Wim, Hendrik - that all makes perfect sense and supports *microcodon* as the correct stem, and Harring was right!

If you agree, I'll summarize your flashes of genius in the Rotifer World Catalog and correct the name spelling accordingly.

On a Family-LAN, I agree with Hendrik that this has the potential of becoming a very frustrating and time-consuming exercise and that we should carefully balance reasons. The pro would be to have all of the rotifer names that are covered by the Code in the LAN, making any discussion on spellings and dates superfluous for all of the pre-2000 names... just sort of ambitious but logical goal after having finished species and genera. On the other side is that family names don't really contribute much to nomenclatural instability... so why bother?

Nice weekend to all,
Christian

Fontaneto D:

Yes, if we assume that the word *Microcodon* would work in Latin with the same rules as most other words ending with -on, such as

- prōton, which in its genitive form is prōtōnis, ablative is prōtōnī, etc.,
- ammon, ammonis, ammoni, etc.,
- triton, tritonis, tritoni, etc.
- charon, charonis, charoni, etc.

- machaon, machaonis, machaoni, etc.
and not like I previously suggested similar to Brachio

nus, Brachioni, etc. (with the root Brachion-), then the root is not Microcod- but it is Microcodon- (making Microcodon, Microcodonis,

Microcodoni, etc.) and the family should indeed be Microcodonidae.

Cheers,
Diego

Jersabek C:

Hi all,

seems we reached common sense and I will correct the family name in the RWC by adding this nomenclatural note:

"Three different spellings of the family name were commonly used in the past: Microcodidae (originally by Hudson & Gosse (1886) [Ref.17291], Microcodonidae (subsequently by Harring (1913) [Ref.17237], and Microcodinidae (subsequently by Remane (1933:516) [Ref. 17700], with the latter name most frequently appearing in major 20th century revisions (e.g. Voigt (1957) [Ref.17630], Kutikova (1970) [Ref.17379], Koste (1978) [Ref.17338]. But Microcodidae after De Smet (2002) [Ref.15747], Microcodonidae after Wallace et al. (2006) [Ref.17896], Fontaneto & De Smet (2014) [Ref.27154]. The family name must be formed, however, by adding the latinized suffix -idae to the stem of the name of the type genus or to the entire name of the type genus (ICZN Art. 29.1.). As the name of the type genus *Microcodon* Ehrenberg is formed from the Greek μικρός (mikrós), and Latin codon, from Ancient Greek κώδων (kódōn - "small bell"), referring to the shape of the animal ("das Glockenfischchen" after Ehrenberg (1838) [Ref.15546]), the correct stem is "microcodon", not "microcod-", and the correctly formed family name is Microcodonidae."

Cheers
Christian

De Smet W:

Dear Christian,
 Sounds good, but to avoid further confusion, maybe also mention Segers, H. (2002) The nomenclature of the Rotifera: annotated checklist of valid family- and genus-group names. J. Nat. Hist., 36, 631-640?
 Best-Wim

Christian Jersabek C:

Oooooops, how could I miss that. Sorry Hendrik!

Here's the updated version:

"Three different spellings of the family name were commonly used in the past: Microcodidae (originally by Hudson & Gosse (1886) [Ref.17291], Microcodonidae (subsequently by Haring (1913) [Ref.17237], and Microcodinidae (subsequently by Remane (1933:516) [Ref. 17700], with the latter name most frequently appearing in major 20th century revisions (e.g. Voigt (1957) [Ref.17630], Kutikova (1970) [Ref.17379], Koste (1978) [Ref.17338]. But Microcodidae after Segers (2002) [Ref.14800], De Smet (2002) [Ref.15747], Microcodonidae after Wallace et al. (2006) [Ref.17896], Fontaneto & De Smet (2014) [Ref.27154]. The family name must be formed, however, by adding the latinized suffix -idae to the stem of the name of the type genus or to the entire name of the type genus (ICZN Art. 29.1.). As the name of the type genus Microcodon Ehrenberg is formed from the Greek μικρός (mikrós), and Latin codon, from Ancient Greek κώδων (kódōn - "small bell"), referring to the shape of the animal ("das Glockenfischchen" after Ehrenberg (1838) [Ref.15546]), the correct stem is "microcodon", not "microcod-", and

the correctly formed family name is Microcodonidae." — Is this correct chronologically: Segers (2002) first and then De Smet (2002)? (NB: the Ref. numbers in the previous passage refer to papers in the Rotifer World Catalog. – RLW.)

Thanks,
 Christian

Selected References

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Former Editors of Rotifer News

Predecessors who propelled the Newsletter



John J. Gilbert
Founding Editor
Initiation of Newsletter 1972
Edited issues: 1-3 (1973-1976)



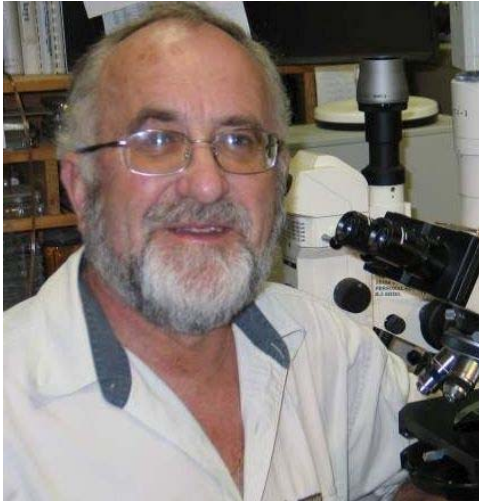
Robert L. Wallace
Co-Edited issues: 4-19
(1981-1991)



James R. Litton, Jr.
Co-Edited issues: 4-14 (1981-1987)



Paul N. Turner
Co-Edited issues: 14-19 (1987-1991)



Russell J. Shiel
Edited issues: 20-33 (1991-2000)

Readers and users of *Rotifer News* gratefully acknowledge the former editors who fueled the newsletter to flying. It is due to their hardwork, the RN is able to flourish and reach global rotiferologists.

All photos have been obtained from the respective editors, except that of JR Litton, Jr. (from the International Rotifer Symposium III, 30 Aug. - 4 Sept. 1982, Uppsala, Sweden).

Spotting rotifers from the sky: A pilot shows the way

Paul N. Turner, M.S. (Biology, Wichita State Univ. Wichita, KS) a professional Air Force Officer (United States Air Force, until 2019), is an amateur rotiferologists who has contributed to the advancement of rotifer taxonomy and ecology. He became interested in rotifers from his father through his father-in-law who was a close friend of Frank Myers. He also co-edited Rotifer News during 1987-1991 (see about the former editors in this issue). Editor.

1987-1990 Research Associate, National Museum of Natural History Department of Invertebrate Biology 'Curated' Museum Rotifer collection; collaborated with Museum Staff on research topics and publications. It was during that decade I was in

contact with the Univ. of Maryland and taught a few classes on Rotifera (taxonomy, systematics and distribution).

1990-1999 Independent research and international collaboration.

During my research and publishing years (1980-1999), I published 19 works on rotifers. All done while working as Air Force Officer. I got my rotifer interest from my father through his father-in-law who was a close of Frank Myers.

Currently I do volunteer mediations to resolve societal issues. Consult: <https://www.mediateyou.com/>

List of my works on Rotifera:

Turner PN 1980 Some rotifers from South-East Virginia. Quekett

- Journal of Microscopy 34 (Part 2): 131-135.
- Turner PN 1980 Seasonal distribution of rotifers in Lake Maury, Newport News, VA. Va J Sci 31 (1-2): 5-8.
- Turner PN 1987 A new rotifer from a coastal lake in Southeastern Brazil: *Hexarthra longicornicula* n. sp. Hydrobiologia 153: 169-174.
- Turner PN 1987 Some rotifers from Kathmandu, Nepal. Microscopy 35: 549-550.
- Reid JW, Turner PN 1987 Planktonic Rotifera, Copapoda and Cladocera from Lagos Acu and Viana, State of Maranhao, Brazil. Rev Zool 48(3): 485-495.
- Turner PN 1988 The rotifer *Brachionus dimidiatus inermis* (Schmarda 1854). 2nd Brazilian Congress of Limnology, Cuiaba, Brazil, Mato Grosso: 24-28.
- Turner PN 1988 *Keratella* rotifers found in Brazil, and a survey of *Keratella* rotifers from the Neotropics. Amazoniana 10(2): 223-236.
- Turner PN 1988 Rotifera. Introduction to the Study of Meiofauna (Eds R.P. Higgins & H. Thiel), Smithsonian Press, Washington D.C. 312-318.
- Turner PN 1990. Some interstitial Rotifera from a Florida USA Beach. Trans Amer Micro Soc 109(4): 417-421.
- Turner PN 1990 Some rotifers from coastal lakes of Brazil, with description of a new rotifer, *Lepadella* (*Xenolepadella*) *curvicaudata* n. sp. Hydrobiologia 208: 141-152.
- Turner PN, Palmer MA 1991 Species composition of the rotifer community inhabiting the interstitial sands of Goose Creek, Virginia with comments on habitat preferences. Quekett Journal of Microscopy 37: 552-565.
- Turner PN, Da Silva C 1992 Littoral rotifers from the State of Mato Grosso, Brazil. Studies on Neotropical Fauna and Environment 4: 227-241.
- Turner PN 1993 Distribution of rotifers in a Floridian saltwater beach, with a note on rotifer dispersal. Hydrobiologia 255: 435-439.
- Turner PN, Distler DA 1995 Notes on the hyporheic Rotifera of the Ninnescah River, Kansas, USA. Transactions Kansas Academy of Sciences 98: 92-101.
- Turner PN 1995 Rotifer look-alikes: two species of *Colurella* are ciliated protozoans. Invertebrate Biology 114: 202-204.
- Turner PN 1996 Preliminary data on rotifers in the interstitial of the Ninnescah River, Kansas, USA. Hydrobiologia 319: 179-184.
- Turner PN, Palmer MA 1996 Notes on the species composition of the rotifer community inhabiting the interstitial sands of Goose Creek, Virginia with comments on habitat preferences. Quekett Journal of Microscopy 37: 552-565.
- Turner PN, Taylor HL 1998 Rotifers new to Florida, USA. Hydrobiologia 387: 55-62.
- Turner PN 1999 A simple generic key to the Bdelloid rotifers. Quekett journal of Microscopy 38: 351-356.

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Invited Contribution: *Comments from an editor of Rotifer News*

It is hoped that the experiences of previous editors would of a great importance for the enhanced visibility of Rotifer News in years ahead - Editor

Biographical sketch

— Robert (Bob) Lee Wallace

- Retired from teaching (spring 2019), but not from scholarship/research.
- Faculty, Ripon College, Ripon, WI (1977–2019): Department of Biology.
- Postdoc. University of Washington, Seattle, WA (1975–1977): Department of Zoology — Ecology of sessile rotifers.
- Ph.D. Dartmouth College, Hanover, New Hampshire, NH (1970–1975): Aquatic Ecology; Invertebrate Zoology.
- B.S. University of Rhode Island, Kingston, RI (1966–1970): major Zoology, minor Chemistry.

I have two professional passions, teaching and research; both revolve around aquatic ecology and invertebrates. However, while I retired from formal teaching in the spring of 2019, in a way, I am still involved in education. For the past nine years I have been active in the Green Lake Association (Green Lake, WI), whose singular focus is on improving water quality of that water body. And, of course, the calling to research continues unabated, especially on rotifers. At the time of writing this précis I am working with several colleagues on research projects

dealing with the distribution, general biology, and ecology of rotifers.

Since the beginnings of the International Rotifer Symposia (IRS) I have been actively involved in the meetings including venue selection, member of scientific committees, reviewing works submitted to the meetings, analyzing trends of rotifer research through IRS submissions, and editing volumes of the proceedings. I am also an advisor in the production of *Rotifer News*. Thus, I am academically as much active following post-retirement as was a regular teaching staff in Ripon College (RC). I thank RC administration for its continued support to realize my research interests on rotifers. With my 50+ years of research and teaching, I am satisfied, but certainly not spent. Two quotes express my approach, both when I was teaching and now in retirement. "*The cure for boredom is curiosity. There is no cure for curiosity.*" — Dorothy Parker. "*Do what you can, with what you have, from where you are.*" — T. Roosevelt

Rotifer News

Being editor of *Rotifer News* (RN) was for me a labor of love. I was a graduate student in the laboratory of John J. Gilbert (Dartmouth College, Hanover, New Hampshire, USA) when he started RN: he asked me to produce the first two covers. These had to be drawn with pen and ink and then transferred to a mimeographic master for printing. Of course, in that crude process much of the anatomical detail of the species could not be rendered. During the early days of RN, I saw that it had an immediate positive impact on what has become known as the *Rotifer*

Family (H. Dumont). Thus, I was happy to take over editorial and production duties when John felt that it was time for the production of RN to move on to someone else. The transfer took place when Jim Litton, another one of John's graduate students, took a position at Saint Mary's College (Notre Dame, Indiana, USA), a few years after I had started at Ripon College (Ripon, Wisconsin, USA). We both held positions of Assistant Professor of Biology in our respective institutions.

A few words about our schools are appropriate so that those who work at large research institutions understand what it is like to have a career at a small, 4-year college. Like many colleges in the US, these two institutions (Ripon and Saint Mary's) were founded and remain dedicated to teaching undergraduate students. Indeed, at such schools teaching is the center of the process when faculty members are reviewed for tenure and promotion. At Ripon, for example, I know that publishing one's research or doing any scholarship outside of the classroom and teaching laboratory was viewed as a curiosity and merely a personal adventure. As such it occupied a tertiary place in faculty evaluations — behind teaching and committee service. I am sure that this was the case for Jim too. Thus, one clear difficulty for both of us was that because research was not really important, production of RN was seen as even less valuable. Also, we did not have graduate students to help with any endeavor. I am not complaining about this, nor am I making excuses; I

specifically wanted this arrangement for my career. (NB: Now at Ripon an authentic, undergraduate research experience is recognized as an important component in their education. Thus, faculty scholarship is recognized as critical in the education of undergraduates).

Thus one may imagine that my greatest concern during my editorial stint on RN was, time. I needed to find the time to squeeze the production of RN in between teaching (ca. 3 courses per semester; 6 courses per academic year), performing departmental duties (I was chair for 6 years), college duties (serving on committees), and, of course, keeping up with my other research/scholarship. All of that was within the background of having a young family. These concerns were important to Jim too.

Other difficulties that I routinely encountered while preparing RNs included slow snail-mail deliveries and lost material that had been posted months before. Fortunately, the costs of production and mailing were covered by voluntary donations from many readers. The departmental secretarial staffs at both institutions used mimeographs to produce RN. That work included deciphering handwritten notes and collating the pages into the correct order. At Ripon using the mainframe computer (DEC PDP11/70, yes that old!) eased the workload for everyone, but it remained labor-intensive, yet still a labor of love.

Jim and I co-edited issues 4–14 (1981–1987), but in 1987 Jim decided to pursue a different career. At that

point I asked Paul Turner to help with RN. Together we co-edited issues 14–19 (1987–1991). With expanding college duties, other responsibilities, and having co-produced 15 issues, I decided that RN should pass onto another rotiferologist, Russ Shiel, who produced issues 20–33.

Selected publications

Wallace RL 1980 Ecology of sessile rotifers. *Hydrobiologia* 73: 181–193.

Wallace RL 1987 Coloniality in the phylum Rotifera. *Hydrobiologia* 147: 141–155.

Wallace RL 1993 Presence of anisotropic (birefringent) crystalline structures in embryonic and juvenile monogonont rotifers. *Hydrobiologia* 255/257: 71–76.

Felix A,* Stevens ME & Wallace RL 1995 Unpalatability of a colonial rotifer, *Sinantherina socialis*, to small zooplanktivorous fishes. *Invertebrate Biology* 114(2): 139–144.

Bevington D,* White C* & Wallace R.L. 1995 Predatory behaviors of *Cupelopagis vorax* (Rotifera, Collothecacea; Atrochidae) on protozoan prey. *Hydrobiologia* 313/314: 213–217.

Wallace RL, Cipro JJ* & Grubbs RW* 1998 Relative investment in offspring by sessile Rotifera. *Hydrobiologia* 387/388: 311–316.

Segers H & Wallace RL 2001 Contribution to a revision of Family Conochilidae (Rotifera; Monogononta; Flosculariacea). *Zoologica Scripta* 30(1): 37–48.

Wallace RL & Ricci C 2002 Rotifera. Pages 15–44. In Rundle SD, Robertson AL & Schmid-Araya JM (eds.). *Freshwater Meiofauna: Biology and Ecology*. Backhuys Publishers, Leiden. The Netherlands.

Wallace RL & Taylor WK 2002 *Invertebrate Zoology*, 6th ed. Prentice Hall, NJ.

Wallace RL 2002 Rotifers: exquisite Metazoans. *Integrative and Comparative Biology* 42: 660–667.

Fontaneto D, Melone G & Wallace RL 2003 Morphology of *Floscularia ringens* (Rotifera, Monogononta) from egg to adult. *Invertebrate Biology* 122: 231–240.

Wallace RL, Snell TW, Ricci C & Nogrady T 2006 Rotifera: Volume 1 Biology, Ecology and Systematics (2nd ed.). *Guides to the Identification of the Microinvertebrates of the Continental Waters of the World* 23 (Segers H, ed.). Kenobi Productions, Ghent, and Backhuys Publishers, Leiden.

Walsh EJ, Salazar M, Ramirez J, Moldes O & Wallace RL 2006 Predation invertebrate predators on the colonial rotifer, *Sinantherina socialis*. *Invertebrate Biology* 125(4): 325–335.

Wallace RL & Smith HA* 2009 Rotifera. In: Likens GE (Ed.) *Encyclopedia of Inland Waters*. Volume 3, pp. 689–703. Oxford: Elsevier.

Obertegger U, Smith HA*, Flaim G & Wallace RL 2011 Using the guild ratio

- to characterize pelagic rotifer communities. *Hydrobiologia* 662: 157–162.
- Walsh EJ, Smith HA & Wallace RL 2014 Rotifers of temporary waters. International review of Hydrobiology 99: 48–57.
- Wallace RL, Snell TW & Smith HA 2015 Phylum Rotifera. In: Thorp, J. & Rogers, D.C. (Eds.), Ecology and General Biology: Thorp and Covich's Freshwater Invertebrates. pp. 225–271. Academic Press.
- Hochberg R, Wallace RL & Walsh EJ 2015 Soft bodies, hard jaws: An introduction to the symposium with rotifers as models of jaw diversity. *Integrative and Comparative Biology* 55(2): 179–192.
- Wallace RL & Uyhelji (Smith) HA 2016 Rotifera, Reference Module in Earth Systems and Environmental Sciences. ISBN: 978-0-12-409548-9 Earth Systems and Environmental Sciences.
- Rivas JA Jr, Mohl J, Van Pelt RS, Leung M-Y, Wallace RL, Gill TE & Walsh EJ 2018 Evidence for regional aeolian transport of freshwater biota in arid regions. *Limnology and Oceanography Letters* 3: 320–330.
- Rivas JA, Schröder T, Gill TE, Wallace RL & Walsh EJ 2019 Anemochory of diapausing stages of microinvertebrates in North American drylands. *Freshwater Biology* 64: 1303–1314.
- Hochberg R, Yang H, Hochberg A, Walsh EJ & Wallace RL 2019 When heads are not homologous: the coronae of larval and adult collothecid rotifers (Rotifera: Monogononta: Collothecaceae). *Hydrobiologia* 844(1): 191–207.
- Yang H, Hochberg R, Walsh EJ & Wallace RL 2019 Systematic distribution of birefringent bodies in Rotifera and first evidence of their ultrastructure in *Acyclus inquietus* (Gnesiotrocha: Collothecaceae). *Hydrobiologia* 844(1): 209–219.
- Young A, Hochberg R, Walsh EJ & Wallace RL 2019 Modeling the life history of sessile rotifers: larval substratum selection through reproduction. *Hydrobiologia* 844(1): 67–82.
- May L & Wallace RL 2019 Long term ecological studies of rotifers: insights into drivers of change, comparability of data and future research challenges. *Hydrobiologia* 844(1): 129–147.
- Brown PD, Schröder T, Ríos-Arana JV, Rico-Martinez R, Silva-Briano M, Wallace RL & Walsh EJ 2020 Patterns of Rotifer Diversity in the Chihuahuan Desert. *Diversity* 12: 393.
- Espinosa-Rodríguez CA, Sarma SSS, Nandini S & Wallace RL 2020 Substrate selection and feeding responses influence the demography of the sessile rotifer *Cupelopagis vorax* (Collothecacea: Atrochidae). *International Review of Hydrobiology* 106(1): 18–28.
- Yang H, Hochberg R, Walsh EJ & Wallace RL 2021 Ultrastructure of

the extracorporeal secretions of four sessile species of Rotifera (Gnesiotrocha) with observations on the chemistry of the gelatinous tube. *Invertebrate Biology* 140(2): e12318.

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Brown PD, Schröder T, Ríos-Arana JV, Rico-Martinez R, Silva-Briano M, Wallace RL & Walsh EJ 2022 Processes contributing to rotifer community assembly in shallow temporary aridland waters. *Hydrobiologia* 849: 3719–3735.

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* — Undergraduates at the time of the research.

My full Curriculum vitae may be found at the following URL.
<https://ripon.edu/wp-content/uploads/2014/11/WallaceR.L.-CV.pdf>

Announcement: International Society of Limnology (SIL)

The 37th Congress of the International Society of Limnology, 2024 (Brazil)

Foz do Iguazu, Brazil: Welcome to the SIL 101, next century and challenges

Congress Theme:

“Building bridges between science and society to reduce the effects of fragmentation and degradation of inland waters”

Kaingang indigenous language (Indigenous tribe from South of Brazil):
“Ēg tỹ goj kri fi ěn rike han jé ciência mré ěg ta, goj ki rĩr jé, kar ti kókén tỹ sĩ ken jé gé ti kar mĩ”

The International Society of Limnology (SIL) was created in 1922 aiming to establish the science of inland waters and consolidate limnology as a relevant and multidisciplinary science.

The SIL Conferences have a great international audience, embracing activities in all continents over the last 100 years.

After almost 30 years, the SIL Congress returned to the Latin American and Caribbean region, representing a relevant point for connecting this region and supporting the integration among countries. This return occurred from the moment at which this region came together through the Latin American and Caribbean Limnology Network (LACAN). The creation of LACAN arises from the need to strengthen and favor the development of Limnology in these regions, generating spaces for sharing ideas and projects, as well as functioning as an “umbrella” for the actions of researchers, societies, and their members, promoting the integration and development of the regional Limnology as a whole. The place chosen for the event, Foz do Iguazu, represents a convergence of three frontiers: Brazil, Paraguay, and

Argentina and indicates the main idea involved in this project, the unity among countries, cultures, and indigenous people on the conservation and sustainable use of aquatic resources.

The 101 Congress of the International Society of Limnology will be held under the auspices of the Brazilian Limnology Association and LACAN aiming to favor the establishment of bridges among stakeholders, indigenous people, and scientists from

different continents and countries for a more inclusive and sustainable future.

The Official Website of the 37th Congress of SIL with details of organizing committee, registration etc. will be soon available.

Luciana Gomes Barbosa
Organizer, SIL 101 (2024, Brazil)

Email: <lgomesbarbosa@gmail.com>

Announcements

Submit your manuscripts to Special Issues

We are looking forward for your manuscripts and appreciate your efforts and contribution to the Proceedings of Rotifera XVI (Zagreb, Croatia, 2022) in **Hydrobiologia**

Important information:

Deadline for the manuscript submission in *Hydrobiologia* is extended until **January 15, 2023**.

When you are ready with a manuscript, please use the online submission system of the journal: <https://www.editorialmanager.com/hydr/default2.aspx> and follow the guidelines for authors of the journal. During the submission process, you will be asked to choose a special issue; select *S.I.: Rotifera XVI* (Spoljar et al.).

Printed special issue of Hydrobiologia,

will cost 10 euros, and 7 euros for shipping and processing. Probably you could expect the issue at the end of 2023.

If you are interested contact Marina Posavec by e-mail: marina.posavec@proputuj.hr
Payment will be conducted through the account of Agency Proputuj.

Bank details:
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Other special issues

For the other publication opportunities, please contact editors as indicated below:

a) A special issue in **Diversity**, on *Biodiversity of Rotifera*, 10 full waivers, handled by Evangelia Michaloudi, with deadline **August 5, 2023**. For more information, check:

https://www.mdpi.com/journal/diversity/special_issues/UDC3QQJ959

or contact Evangelia:
tholi@bio.auth.gr

b) A special issue in **Water**, handled by Natalia Kuczynska-Kippen and Maria Špoljar, on *Biodiversity and Functionality of Plankton Communities*, 10 full waivers, with deadline **December 31, 2023**. For more information, check: https://www.mdpi.com/journal/water/special_issues/plankton_communities, or contact Maria: maria.spoljar@biol.pmf.hr, and Natalia kippen@hotmail.pl

c) A special issue in the **Journal of Limnology** handled by Diego

Fontaneto, regarding datapapers on freshwater biodiversity, with publication costs covered by GBIF for 16 datapapers, with deadline on **December 15, 2022**. For more information, check: <https://www.gbif.org/news/2Z7fge80XcPXfdas6iysh7/call-for-data-papers-to-fill-gaps-on-freshwater-species> or contact Diego, diego.fontaneto@cnr.it

Maria Špoljar
Rotifer XVI Organizer

Email: maria.spoljar@biol.pmf.hr

Invitation to participate in the VRC presentations

The Virtual Rotifer Collaboratorium (VRC) is organized by S. Nandini. As mentioned by Linda May during the Rotifera XVI (Croatia), the VRC is now

extended to all rotiferologists. The most recent VRC was held on 25th Oct 2022 (see screen-shot 3). The abstract of the VRC appears here: For those who would like to participate in the VRC, contact: nandini@unam.mx



Screen-shot 3. VRC Zoom Meeting

Abstract of VRC presentation

VRC: 25 Oct. 2022

The art in plankton

Marcelo Silva-Briano* & Araceli Adabache-Ortiz
 Universidad Autónoma de Aguascalientes. Centro de Ciencias Básicas. Edificio 202. Laboratorio 1, Ecología. Av. Universidad 940. Ciudad Universitaria. Aguascalientes, Ags. Mexico. C.P. 20100. Tel:52(449)9107400 extn. 51110. Email: msilva@correo.uaa.mx

*Presenting author

In Aguascalientes State, the plankton is really beautiful and wonderful. Algae, Protozoa, Rotifera, Cladocera are some of the incredible species inhabiting the waterbodies of the state. Three species of Rotifera were recorded and described as new species. The three species are: *Brachionus araceliae*, Silva-Briano, Galván-De la Rosa, Pérez-Legaspi & Rico-Martínez, 2007, *B. josefinae*, Silva-Briano & Segers, 1992, and *Keratella mexicana*, Kutikova & Silva-Briano, 1995. They are very rare in the waterbodies of the State, for example *B. josefinae* and *B. araceliae* were found in just two temporary ponds each one, and less rare, *K. mexicana* was collected in just 10 ponds (Silva-Briano & Adabache-Ortiz, 1999). In case of Cladocera as, *Macrothrix agsensis*, *M. mexicanus* and *M. sierrafriatensis*. Also, *Karualona penuelasi* and *Pseudochydorus margaritafonsorum* are new to science. After a special Photoshop treatment, SEM microphotographs of all these species are shown giving a

new dimension to these images, despite the fact that in nature they are beautiful and with extraordinary architecture.

Rotifera in Dissertation / Thesis

Dissertations or theses with rotifers as theme of research from Mexican Universities are indexed here (see editorial). Missing or new works will be included in future issues.

Alcántara-Rodríguez, J. A. 2018 [The lakes of the Cuenca Oriental basin as a model for the study of aquatic communities with insular distribution patterns using molecular markers in rotifers]. Doctoral Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.154 (in Spanish).

Ángeles, E. M. 2016 [Use of microaggregates as first food in whitefish larvae (*Chirostoma estor*)] Master's Thesis, Universidad Michoacana de San Nicolás de Hidalgo (UMSNH), Mexico. pp. 93 (in Spanish).

Arroyo-Castro, J. L. 2019. [Description of the *Iecane bulla* species complex (Rotifera: monogononta) in aquatic ecosystems of Quintana Roo through an integrative taxonomic approach]. Master's Thesis, Centro de Investigación Científica de Yucatán A.C (CICY), Mexico. pp. 135 (in Spanish).

- Ayala, A. M. 2015 [Variation of the rotifer community in the root zone of vegetation in a degraded alluvial terrace of Zapotitlán Salinas, Puebla]. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.68 (in Spanish).
- Carmona-Ruiz, J. A. 2018 [Pattern variation in the life history of *Brachionus dimidiatus* and *Hexarthra jenkiniae* rotifers from ephemeral and permanent sodic water bodies of the Lake Texcoco]. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.81 (in Spanish).
- Contreras-Jiménez, J. 2015 [Analysis of intrapopulation and interpopulation variability of geographically isolated species of the genus *Asplanchna* (Rotifera) distributed in lagoons in the center of the country, using morphological and molecular markers (COX 1)]. Doctoral Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.136 (in Spanish).
- Contreras-Tapia, R. A. 2016 [Use of probiotics in the culture of *Brachionus calyciflorus* (Rotifera)]. Master's Thesis, Universidad Autónoma Metropolitana (UAM), Mexico. pp.129 (in Spanish).
- Cota, M. B. 2015 [Study of the incorporation of the live yeast *Debaryomyces hansenii* through the rotifer *Brachionus rotundiformis* during the first days of development of the jack mackerel *Seriola rivoliana*]. Master's Thesis, Centro de Investigaciones Biológicas del Noroeste, S. C. (CIBNOR), Mexico. pp. 98 (in Spanish).
- Cruz, I. C. 2019 [Evaluation of endemic microalgae for cultivation and enrichment of live prey and their application in the first feeding of *Seriola rivoliana*]. Doctoral Thesis, Centro de Investigaciones Biológicas del Noroeste, S. C. (CIBNOR), Mexico. pp. 84 (in Spanish).
- Delgado Sánchez, L.A. 2022 [Structure of the zooplanktonic communities as an alternative indicator of water quality in the River Chalma]. Master's Thesis, Universidad Autónoma del Estado de Morelos, Mexico. Pp. 96 (in Spanish).
- Espinosa-Rodríguez, C. A. 2016 [Impact of the invasive macrophyte *Egeria densa* on the zooplankton community present in the Benito Juárez dam (Villa del Carbón, Edo. de Méx.)]. Doctoral Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp. 155 (in Spanish).
- Figuroa, G. R. 2021 [Study the lethal and sublethal toxicity of the metals Co, Cr, Mg, and Pb, and their entry and distribution pathways in the rotifer *Euchlanis dilatata*]. Master's Thesis, Universidad Autónoma de Aguascalientes (UAA), Mexico. pp. 45 (in Spanish).
- Figuroa-Sánchez, M. A. 2020 [Invertebrates, fish, and macrophytes: biotic factors involved in reducing *Microcystis* spp. in a eutrophic system]. Doctoral Thesis,

- Universidad Autónoma Metropolitana (UAM), Mexico. pp. 155 (in Spanish).
- Flores, H. S. 2020 [Acute and chronic toxicity study of five metals (Cu, Fe, Hg, Ni, and Zn) in four planktonic species]. Doctoral Thesis, Universidad Autónoma de Aguascalientes (UAA), Mexico. pp. 126 (in Spanish).
- García, M. Z. 2020 [Determination of the biomass of the rotifers community in the Cuernavaca Canal in Xochimilco, Mexico]. Master's Thesis, Universidad Autónoma Metropolitana (UAM), Mexico. pp.156 (in Spanish).
- Garza-León, C. V. 2018 [Location and distribution of important pesticides in guava crops in the municipality of Calvillo, Aguascalientes, and evaluation of adverse effects on native zooplankton species]. Doctoral Thesis, Universidad Autónoma de Aguascalientes (UAA), Mexico. pp. 96 (in Spanish).
- Gomez-Cabral, G. C. 2015 [Effect of temperature on demography and morphometrics of different populations of *Brachionus calyciflorus* pallas, 1766]. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.74 (in Spanish).
- Gonzalez- Perez, B. K. 2015 [Effects of different concentrations of selected drugs (anti-inflammatory (ibuprofen) and antibiotic (amoxicillin)) on *Brachionus calyciflorus* and *Brachionus havanaensis* (Rotifera): A population level study]. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.81 (in Spanish).
- Gonzalez- Perez, B. K. 2019 [Effects of selected endocrine disruptors on *Platyonus patulus* and *Brachionus havanaensis* (Rotifera) through different generations] Doctoral Thesis, Universidad Autónoma Metropolitana (UAM), Mexico. pp.142 (in Spanish).
- González-Ávila, A. 2022 [Effect of the anionic surfactant sodium dodecyl sulfate on the population dynamics of *Brachionus havanaensis* and *Platyonus patulus* (Rotifera: *Brachionidae*)]. Universidad Nacional Autónoma de México (UNAM), Mexico. pp.77 (in Spanish).
- González-Gutiérrez, S. 2015 [Seasonal variation of monogononta rotifers (Rotifera) in the littoral zone of the Cantera Oriente water bodies (Mexico City) during 2013-2014. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.118 (in Spanish).
- Guevara-Franco, J. A. 2019 Cyanoprokaryotes control through the introduction of macrophytes and rotifers in Cuernavaca: a study at the mesocosm level]. Master's Thesis, Universidad Nacional Autónoma de México (UNAM), Mexico. pp.103 (in Spanish).
- Gutiérrez-Quevedo, M. G. 2014 [Contribution to the study of zooplankton diversity in three tropical lakes and its relationship with land use in los Tuxtlas,

- Veracruz]. Master's Thesis, Universidad Veracruzana, Mexico. pp.157 (in Spanish).
- Hernández-Pedraza, M. 2019 [Evaluation of sunscreen toxicity in zooplankton (Rotifera, Ostracoda and Cladocera) and fish (*Poeciliidae*) from Quintana Roo]. Master's Thesis, Centro de Investigación Científica de Yucatán A.C (CICY), Mexico. pp. 97 (in Spanish).
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Invited Article

**Authoring Books: Enjoyable Learning Experience
of an Indian Author ©****T.J. Pandian***

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My understanding of Rotifera is from a former associate Dr. S.S.S. Sarma. Within Metazoa, Rotifera is one of the 26 recognized minor phyla, which comprise aberrant clades that are usually not considered in the mainstream of evolution, as most of them terminate as blind offshoots. Hence, I request the readers to look at this article more from the point of metazoans in a broader sense of our understanding of biology.

With my very first publication being recognized as a Citation Classic, I have authored about 200 original publications. I must confess that my contributions are limited to fish and frogs, crustaceans and insects, spiders and snails. To all other groups of animals and eukaryotes, I have been a visitor. With the torrential rain of research publications, the need is obvious for reviews, chapters and books, which comprehensively summarize the contributions in a specific field and point out new findings and/or direction for future research. Realizing this fact, I have authored a 'commendable long detailed review' (*Underwater Information Bulletin*, August 1975, p 45) on 'Mechanism of Heterotrophy' (Pandian, 1972). As my earlier publications are on energetics, I have jointly edited *Animal Energetics* (Pandian and Vernberg, 1987a, b), to which as many as 25 leading

international experts contributed chapters ('*The book is of high quality, and it left me with a series of new questions and exciting ideas for research*' - Kenneth, A. Nagy, University of California, LA). Besides, I have had the fortune of studying Botany as an ancillary subject during undergraduate course and also took a course in Botany at the Universität Kiel. I have also been fortunate to listen lectures on different disciplines of biology by students and faculty in the weekly 'Aqua-Terr' meeting at School of Biological Sciences, Madurai Kamaraj University. These emboldened me to have a holistic view and author books on one or other animal phyla and eukaryotic kingdoms, as well.

The Indian Scenario: Even within BRICS countries, the financial support for science by India is woefully inadequate; it is < 0.7% of GDP, which may be compared with 2.1% GDP of China (Das, G, 2019, *businesstoday.in*). Not surprisingly, India's status has declined from the third largest producer of scientific articles in 2018 to the fifth in 2019; this decline is continuing. Incidentally, the total number of scientific publications increased from 48,998 in 2008 to 1,35,788 in 2018 (Ravi and Honwad, 2020). Unfortunately, no information is available on the number of Indian scientists authoring books. Notably,

India mostly exports scientific articles and imports books on science and technology. Firstly, most Indian scientists do not have the urge to author books to highlight the Indian contributions. A meager financial support was extended by the Department of Science and Technology (DST), Government of India to encourage senior scientists to author book(s). As most beneficiaries did not publish, the DST discontinued the project. The second reason is a lack of library facilities. Of course, the University Grants Commission (UGC) made an effort to provide a link to scientific journals for impoverished universities. Unfortunately, the conventional Librarians have not risen to the expected level to help even the few enthusiastic authors.

By 2000s, I realized that single author books, which view holistically and analyze incisively available information to synthesize new ideas, are as important as edited books, in which leading experts – like spangled horses – contribute chapters as products of intensive and critical analysis. Serving as National Professor, I had direct access to laboratory and students until I was 70 in June 2009. Subsequently, I used my house as laboratory, brain as equipment, and original publications as Guinea pigs to author books. I am aware that they are secondary contributions to science, but are a necessary bedrock for posterity. Between 2011 and 2023, 15 of my books, in the 3 series listed below, were published by CRC Press, USA. I must gratefully acknowledge T. Balasubramaniam and R. Gadagkar

who initiated me into this task; and I also thank E. Vivekanandan and P. Murugesan, who reviewed the manuscripts of almost all my books. Finally thanks are due to CRC Press, especially its Indian editor Sri Raju Primlani for uninterrupted support. I wish to thank my part time computer assistants Messers S.P. Geetha, S. Akila, C. Prabha, T.S. Balaji, and T.S. Surya for their competence, patience, and cooperation; in fact, I supported their education and *in lieu* thereof, they assisted me.

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Personal Experience: Irrespective of not being attached to an institution, and receiving little financial support, I had “a comprehensive understanding and a deep abiding love of the subject” to author books. Throughout the last 15 years, I was literally bombarded with ‘heaven-sent ideas’ that had to be tested for correctness. Through computer search of books and reviews, relevant publications on a selected topic could readily be identified. However, collection of them posed a major problem. Fortunately, the excellent library and visitor-friendly facility at the Central Marine Fisheries Research Institute (Kochi) provided me access to these publications and to author five volumes in the first series on Fish and two volumes on Crustacea and Mollusca in the second series. By the time, I had to go for Echinodermata, Annelida, Platyhelminthes, and Minor Phyla, a Russian website came to my rescue, through which I had access to adequate number of original publications. I gratefully thank the timely help rendered by a former student Dr. Daniel Premkumar (premkumardaniel@yahoo.com), who purchased a rare, very old, but important publication from a US library and sent it to me. In all, I have referred over 11,000 original publications from widely scattered journals and other literature sources. After assimilation of these publications, it has been a task to pick-up the required or relevant

finding(s). To author a sub-topic or sometime even a page, I spent 4–6 hours. It took another 1–2 hours to collate, sequence and synthesize an idea. On an average, I wrote one page a day to bring out a 300-paged book per year. Incidentally, the manuscript for my first book alone was prepared at Dr. R.D. Michael’s laboratory, Lady Doak College, Madurai. All others were made at home.

Another problem encountered by all enthusiastic authors is the copyright of published figure(s) to be reproduced in a book. To reproduce a figure and that too in limited number of copies, permission has to be obtained from a publisher, who demands copyright fee. This demand is a serious deterrent to an author from a developing country like India and more specifically in my case, as pensioner. A few publishers readily permit on email request. For the benefit of potential authors, I may mention a few journals, from which permission can readily be obtained: *Acta Botanica Brasilica*, *Aquatic Biology*, *Bulletin of Marine Science*, *Copeia*, *Current Science*, *Development*, *Growth and Differentiation*, *Diseases of Aquatic Organisms*, *Endocrinology*, *Experimental Parasitology*, *Fishery Bulletin*, *Genes*, *Genetics*, *Ichthyological Research*, *Integrative Comparative Biology*, *Journal of Ecology*, *Journal of Oceanography*, *Korean Journal of Parasitology*, *New Phytologists*, *Ohio Journal of Science*, *Parasites & Vectors*, *Proceeding of National Academy of Sciences USA*, *Reproductive Biology and Zootaxa*.

I offer these journals my sincere thanks. Considering the subject Genetics, the following examples (Table 1) may provide an idea to select a journal by an author to reproduce a figure. Interestingly, it also provides an idea for original contributors to select a journal to publish their findings so that their figures could readily be reproduced in reviews, chapters, and books. *Genetika* and *Genetic Research* provide open access to reproduce figures, but have low impact factor. Copyright journals like *Genetics* have high impact factor. Earlier Genetic Society of America (GSA) readily issued permission to reproduce figure(s); presently, it is published by Oxford University Press, which demands subscription fee and the GSA may charge copyright fee. Others like *Genetica* and *Journal of Genetics*, *Genomics* with high impact factors, provide open access to articles, that were paid by the authors. But for others, they demand copyright fee, which an author from developing country can ill-afford.

An escape route from payment of copyright fee was suggested to me by a leading Indian bibliometric analyst Subbiah Arunachalam. Accordingly, avoid as far as possible reproducing copyrighted figures, especially ideograms, DNA ladders and such others. When a figure from copyright journal has to be reproduced, simplify the figure by showing only the trend, but not the reported values, and thereby introduce a deviation in the copyrighted figure or preferably compile two copyright figures. In acknowledgements, thank the authors/publishers, whose published figures were modified/ simplified/ compiled for an easier understanding.

Reproduction is central to all biological events. Sexuality, Sex Determination and Differentiation in Fish was my first book series. Fish are a fascinating group of animals, that are known for their sexual plasticity and diversity. Scanning through widely scattered literature, that reports perplexing

TABLE 1

Details on publishers and copyright status for a few genetic journals.

Name	Published by/for	Copyright status	Impact factor
<i>Genetika</i>	DOAJ	Open access	0.75
<i>Genet Res</i>	Cambridge University Press with Hindawi partnership	Open access	1.37
<i>J Genetics</i>	Springer Nature for Indian Academic of Sciences (IASc)	Copyright with IASc	1.58
<i>Genetica</i>	Springer	Partly supports open access	1.63
<i>Genetics</i>	Oxford University Press for GSA	Copyright with GSA	4.40
<i>J Genet Genomics</i>	Elsevier	Partly supports open access	5.73

sexuality, the first volume shows that of 32,510 species, 160 species are hermaphrodites. In an unbelievable array, hermaphroditism exists, ranging from simultaneous to sequential, and to serial (12 species). Simultaneous hermaphrodites (22 species) do not change sex, but can act as female or male at the same time (e.g., the Mexican killifish *Kryptolabius marmoratus*) or within a short span of time (e.g., *Serranus tortugarum*). The sequentials change sex but only once in a single direction during their lifetime. On the other hand, the serials do it more than once in either direction (e.g. *Gobiodon histrio*). Within sequentials, protandrics (94 species) change sex from male to female (e.g. *S. baldwini*) but protogynics (32 species) from female to male (e.g. *Lates calcarifer*). The former is divided into monandrics and diandrics (e.g. *Halichoerus pictus*). The monandrics are further divided into monochromatics (*S. baldwini*) and dichromatics (e.g. *Sparisoma viride*). The range of morphotypes encountered within a sex is also astounding (e.g., male: stalker, sneaker, satellite, territorial, piracy and so on). Modes of reproduction also ranges from sexual to gynogenesis and hybridogenesis. Not surprisingly, sex determination in fish remains highly flexible and plastic. and exhibits the most diversity for greater understanding of sex determination among animals. Even more flexible is the process of sex differentiation in fish. Though sex is determined by sex chromosomes, one or more genes harbored on autosomes have an

overriding impact and alter to opposite sex. Being small, the sex steroids can readily pass-through biological membranes. My book on *Endocrine Sex Differentiation in Fish* is perhaps one of the few that projects the endocrine and behavioral role in sex differentiation among gonochores and trans-differentiation in sex changers. Unlike in mammals, expression of sex differentiation genes in fish is switched on or off by environmental factors like temperature, hypoxia and anoxia, pH, and precipitation; of these, temperature plays a vibrant role in altering sex differentiation process. Hence, a chapter was devoted in all the books on climate change and ocean acidification, and their impacts on reproduction.

Through her six-volume treatise, L.H. Hyman (1888–1969) accumulated bits and pieces of information on reproduction of invertebrates. A.C. Giese and A.S. Pearse (USA) provided a shape to the subject of reproduction, but limited their work to *Marine Aquatic Invertebrate Reproduction*. Approaching from the angle of structure and function, K.G. Adiyodi and R.G. Adiyodi (India) elevated the subject to a visible and recognizable status. As > 80% of animal species undergo indirect development (see Pandian, 2021b), any account on reproduction without considering development remains incomplete. Hence, I chose to author a six-volume series on *Reproduction and Development in Aquatic Invertebrates*. The series updates and comprehensively elucidates the subject in the context of growing development in cytogenetics and

molecular biology, and views the topic from embryonic stem cells and primordial germ cells. The following serve as examples for new findings. In tropical, temperate, and arctic crustaceans, investment on generation time as function of life span averages to 28, 48, and 85%, respectively. Consequently, tropical crustaceans are 10-times more fecund than their temperate counterparts. In molluscs, the presence of shell(s) affords a longer life span and iteroparity in prosobranchs and bivalves, but its absence, short life span and semelparity in opisthobranchs and cephalopods. Only <0.5% animals and plants can afford semelparity (Pandian, 2022). In 75% of echinoderms, obligate need for acquisition of food by a mouth that is directed to the substratum has eliminated them from colonizing pelagic realm as plankton, and the entire water column as nekton, except adults of a few feather stars (*nationalgeographic.com*). Clonal (asexual) multiplication can sustain an annelidan species over 30–60 years; the fact that on stress, they reproduce sexually, reveals the transmission of primordial germ cells through 1,000–3,000 clonal generations. In Platyhelminthes, high fecundity supplemented by (i) clonal multiplication, (ii) incorporation of second intermediate host (SIH), (iii) flexibility and choice of SIH, and (iv) clonal selection in SIH have rendered digeneans as the most speciose order. The minor phyla are not as speciose (1,795 species/phylum) as the major phyla (157,066/phylum). The causes

for this limitation are traced to (i) eutelism (66%), (ii) clonality (22%, or ability for asexual propagation), (iii) parthenogenesis (6%), and (iv) selfing hermaphroditism (~1.2%). For the first time, the prevalence of eutelism in all the six pseudocoelomate phyla including Rotifera is brought to light. Eutelism eliminates mitotic divisions in somatic cells after hatching. Consequently, the number of somatic cells remains limited in eutelics. For example, the number ranges from 428 in the bdelloid *Habrotrocha rosa* to 959 in the monogonont *Asplanchna priodonta* (Pandian, 2021a). Eutelism also limits oogenesis to produce only 30–300 eggs/female and more critically spermatogenesis. Consequently, a large fraction of their eggs remains sterile. In the minor phyla, clonality and parthenogenesis mutually eliminate the existence of each other.

Evolution is accepted theory and the principle paradigm of biology. Presently, there are considerable concern for species diversity than for evolution. The burgeo-



burgeoning concern on conservation of biodiversity culminated at signing of the Conservation of Biological Diversity in 1992. The year 2010 marked the International Year of Species Diversity. Countries like India minted special coins. And in recognition of its importance, Levin (2001–2012) brought out 5,484 paged seven volume series on *Encyclopedia of Biodiversity* including many chapters authored by leading experts

on different aspects of biodiversity ranging from habitats to ecosystem, extinction to existing, invasion to economics, etc. Viewing it from holistic angle, my third book series on *Evolution and Speciation in Animals, Plants, Protozoa and Fungi* has identified the following root causes that govern species diversity: Environmental Factors: 1. Space, 2. Light – Temperature, 3. Precipitation – Availability of liquid water and Biological Attributes, 4. Cellularity, 5. Symmetry, 6. Clonality, 7. Sexuality – Hermaphrodite and Selfing, 8. Modality (of life cycle), and 9. Motility. Considering clonality, the following example provides an idea about how these books have presented new findings. From an innovative analysis, an inverse relation is established between clonality and number of tissue types (see below) in eukaryotes. Clonality is reduced from 100% in unicellular protozoans to 89% in seven tissue typed fungi. In plants, the reduction is gradual from 100% in <9 tissue typed algae to 59% in 14 tissue typed bryophytes, and 41 tissue typed gymnosperms, and to 24% in 60 tissue typed angiosperms. But, this reduction is more drastic in metazoans: decreasing from ~100% in 7–9 tissue types in sponges and cnidarians to <1% for 14 tissue types in acoelomate planarians, and 60 tissue types in coelomate worms and to 0% in >200 tissue types in vertebrates. The reasons for this difference is traced to the fact that metazoans undergo irreversible differentiation at fertilization or early embryonic stage and subsequently,

their gonads and some somatic organs. But in plants, the differentiation is reversible, expressed at a later stage of life and is limited to reproductive organs.

Turning to eukaryotic biodiversity, plants are autotrophs and sessile but animals are heterotrophs and motile. Uniquely, fungi are sessile like plants, but heterotrophs like animals. In animals, combination of heterotrophy and motility has demanded development of complex structures, measured in unit of tissues. Motility facilitates mate-searching and outbreeding. Consequently, animals are enriched with >1.5 million species (Table 2). In plants, sessility imposes 94% hermaphroditism, 23% selfing, 3% polyploidization, and 39% clonality, which have limited the diversity to <374,000 species. During their variable evolutionary history, plants have chosen variety diversity rather than species diversity. For example, there are 1,664 variety/plant species, in comparison to 277 variety/animal species. In contrast to heterotrophic animals, fungi have opted for external digestion and absorption of micronutrients, which has required surface expansion and limited tissues to <8 types. In its turn, it has facilitated clonality in 91% of them, limiting the diversity of fungi to ~106,761 species.

Eukaryotes include four kingdoms namely (i) Protista (32,950 species), (ii) Fungia (106,761), (iii) Plantae (374,000), and (iv) Metazoa (1,543,196). Notably, with increasing structural complexity in these kingdoms, the number of species increases. During the last ~300 years, ~2.1 million eukaryotic species have

been described. In prokaryotes consisting of bacteria and others (Table 2), the ubiquitous clonal multiplication has limited their species number to ~10,000 species. Like plants, prokaryotes have also gone for more strain diversity rather than species diversity. For instance, since 2019 the Corona virus is known to evolve new strains approximately every 3 months. In comparison to prokaryotes, eukaryotes have been more successful and have witnessed maximal species diversity. For the planet Earth, predictions for the existing number of species ranges from 3 to 10 million. Mora et al. (2011) have estimated that to describe the remaining 7.5 million species, it may

require 303,000 taxonomists, 1,200 years and ~364 billion US\$ at the rate of 48,500 US\$ to erect a species. During the last 20 years, the description rate for eukaryotes has, however, remained at 6,200 species/year. According to the present estimate, the Earth may have not more than 3 million species. The description of remaining ~1 million species may require 40,400 taxonomists, 160 years and ~50 billion US\$.

Having had an enjoyable learning experience, with folded hands, I welcome the readers to have a glance over my books on Evolution and Speciation in Animals, Plants, Protozoa, Fungi, and Eukaryotic Biodiversity. Thank you,

TABLE 2

Described and expected species number of prokaryotes and eukaryotes (modified from Pandian, 2023)

Kingdom	Described	Expected
Eukaryotes		
Animalia	1,543,196	1,800,000
Plantae	374,000	584,000
Fungia	106,761	260,000
Protista	32,950	36,400
Subtotal	2,056,907	2,680,400
Prokaryotes		
Archaea	502	455
Bacteria	10,358	9,980
Subtotal	10,860	10,435
Grand total	2,067,767	2,690,835



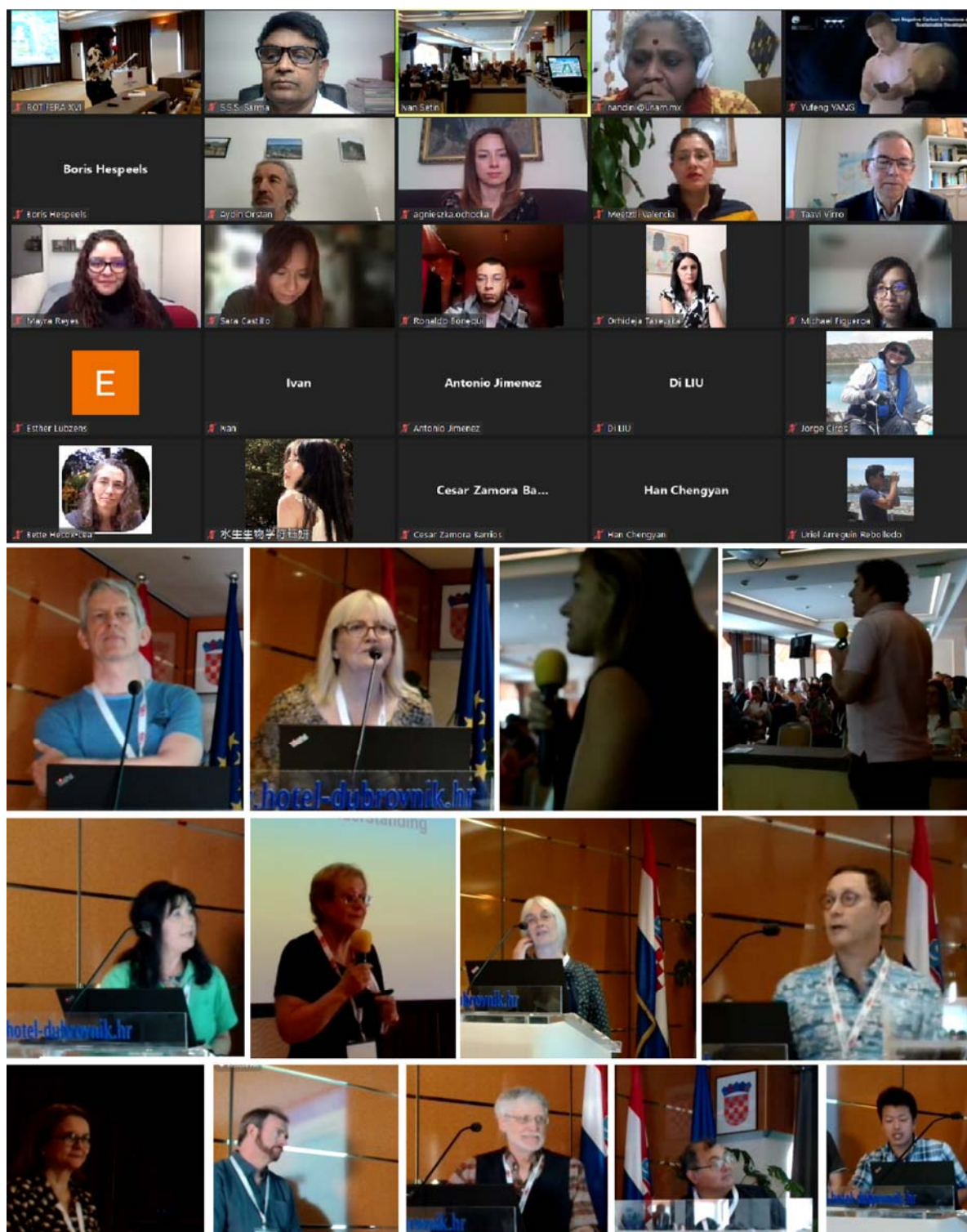
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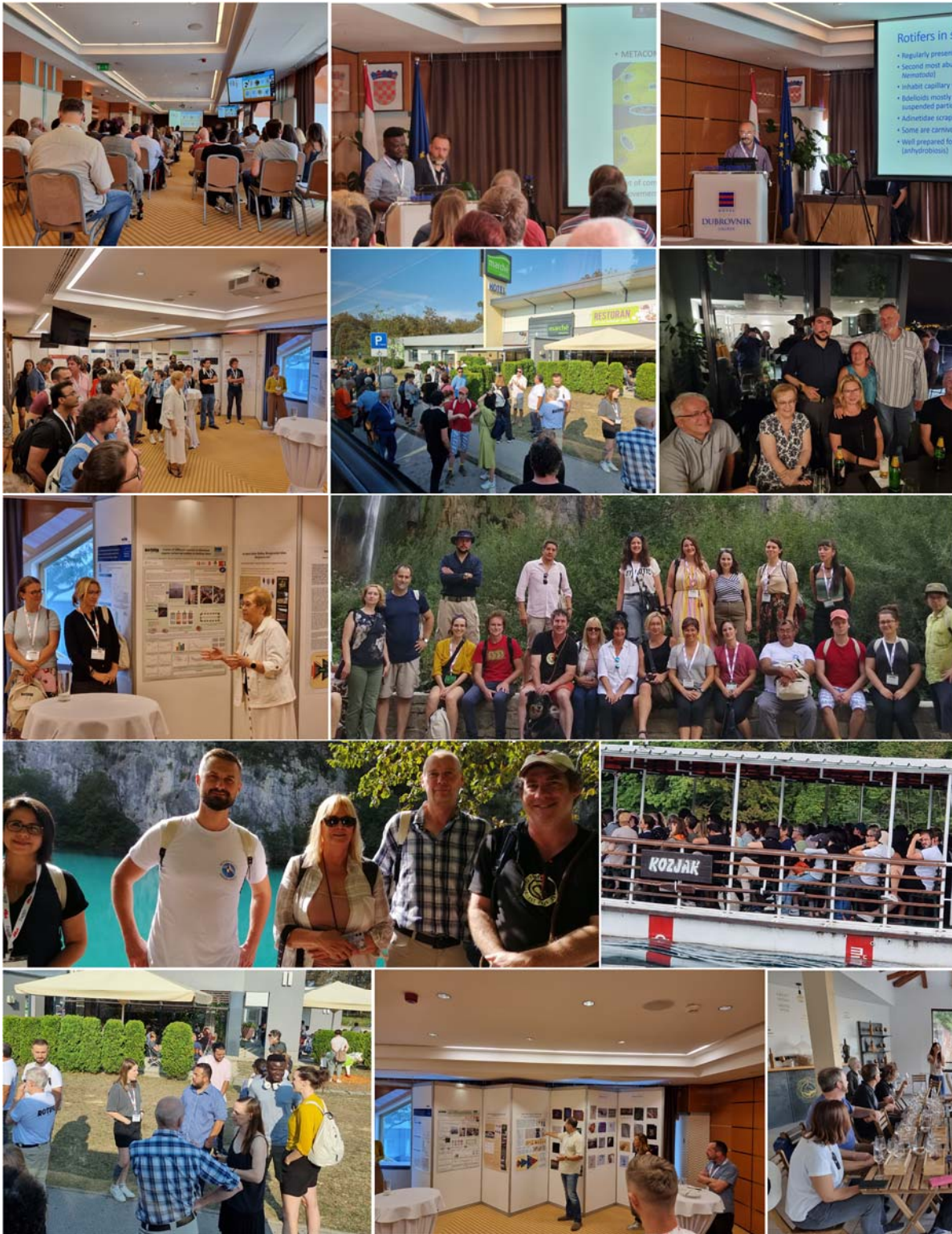
***Prof. T.J. Pandian** (Valli Nivas, 9 Old Natham Road, Madurai 625 014, Tamil Nadu, India) is a recipient of the Bhatnagar Prize, the highest award for a scientist in India and one of the 10 National Professorships. He is an elected Fellow of all Indian academies and Third World Academy of Science (Trieste, Italy). He has served as Editor/Editorial Board Member of many leading international journals.

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Screen-shots of Rotifera XVI during Zoom meeting



Some photos taken at the Rotifera XVI (2022)



Invitation

Save the dates: July 31 – Aug 4, 2023!

Workshop: Advances in Rotifer Phylogeny with a focus on reproductive traits

Where: University of Texas at El Paso campus (El Paso, Texas, USA)

When: July 31 – Aug 4, 2023

Tentative Topics: Introduction to Rotifera, Areas of worthy systematic inquiry, Culture & egg collection, DNA extraction & marker analysis, Using ddRADSeq/UCRs in phylogenetics, Bioinformatic pipeline development, Cryptic species, Molecular phylogenomics, Microbiome and ecology of rotifers, Microscopical techniques. Specialized lectures: AFM, CLSM, Biomolecule analysis (GCMS/NMR). Discussion: are

collaborations possible? UTEP Centennial Museum tour: exhibit featuring rotifer reproduction in ephemeral habitats.

Optional post-workshop field trips: nearby national and state parks (nominal additional cost: T.B.D.)

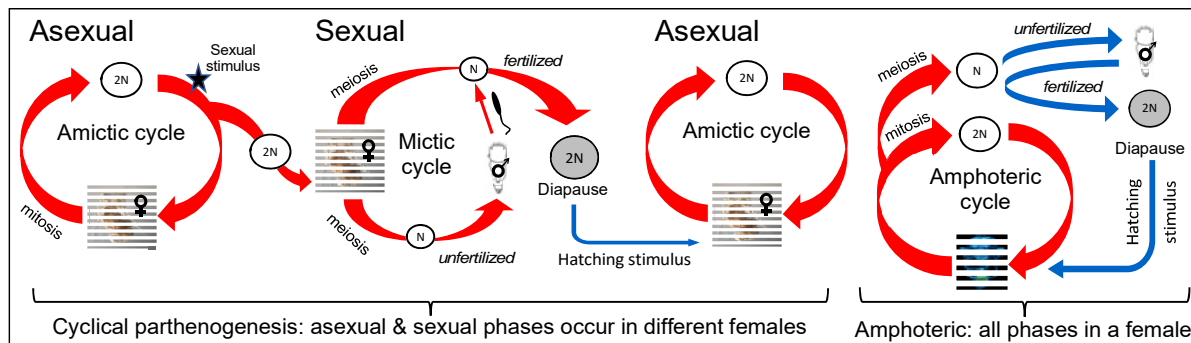
Registration: Opens Feb 1, 2023:

students: \$50, faculty: \$100.

Housing: Dorms are available on campus for approximately \$30 per person night; many hotels in the vicinity.

Dining Options: Campus venues and many local restaurants.

Hosted by: Liz Walsh, Robert Wallace, Rick Hochberg, Jon Mohl, Diego Fontaneto & Francesca Leasi.



For further information, contact:

Elizabeth Walsh
Email: ewalsh@utep.edu

Obituary: Dr. R.C. Dalela

**Prof. R.C. Dalela**

(July 7, 1936 - December 12, 2022)

With profound grief, we announce the sad demise of Dr. R.C. Dalela, Founder & Editor-in-chief of *Journal of Environmental Biology*.

Dr. Dalela was a well-known academician, Zoologist & Toxicologist, who had contributed immensely to the advancement of science. He obtained his Ph.D. in Zoology from Agra University, Agra (India) in 1964. He headed the Postgraduate Department of Zoology, D.A.V. College, Muzaffarnagar, Uttar Pradesh (India) for 30 years (1967-1996). He had teaching and research experience of over 37 years and had supervised 13 Ph.D. theses. His field of research included Fish Toxicology, Environmental Pollution & Education. Dr. Dalela had published 120 research papers in National and International

Journals, authored 6 Text Books on Zoology and its subspecialties, and edited 6 Proceedings of different seminars and symposia. He was a Fellow of the Society of Toxicology, India (FST) and The Academy of Environmental Biology, India (FAEB), and a Life Member of the National Academy of Sciences, India, and the Indian Science Congress Association. He was also the President of the Society of Toxicology, India (STOX) from 1989-1991.

A recipient of "AEB Honours" award, he founded the **Academy of Environmental Biology**-a body of Environmental Scientists and Toxicologists in 1978. Realizing the need for an International research journal to cater to the needs of Environmental Biologists and Toxicologists, Dr. Dalela launched *Journal of Environmental Biology* (JEB) in 1980 and served as Editor-in-chief of JEB for over 4 decades (1980-2022). He was a dedicated editor, who led JEB with great commitment and established it in the international scientific arena. Today, *Journal of Environmental Biology* is popular among the research fraternity worldwide.

Some of the world's rotiferologists, such as Maria Rosa Miracle, RL Wallace, TW Snell and SSS Sarma were/have been associated with JEB. We hope to continue his legacy in promoting research on environmental biology through JEB.

Divakar Dalela, Executive Editor, *JEB*
Sumati Gaumat, Editor, *JEB*
 Email: editor@jeb.co.in

Piñata of *Plationus patulus*

Plationus patulus Piñata

A piñata is a decorated pot or a paper-mâché container. It is filled with candy and fruits and held at an adjustable height with a strong rope. Breaking it using a stick by blindfolded persons is a tradition in Mexico for most celebrations such as birthdays or religious events. Piñatas come in different shapes and sizes. Here is a piñata in the shape of *Plationus patulus* (made by a student, Ana Elisa Morales Grajales, see left photo). We had a lot of fun breaking it during our laboratory Christmas Party for the year 2022.



Authors are encouraged to submit contributions to *Rotifer News*.
Contact email account: rotifernews@gmail.com

For details, please visit the website:
<https://sitios.iztacala.unam.mx/rotifernews/>

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