

PSAMMONALIA

Newsletter of the
International Association of Meiobenthologists



Number 100, May 1993

Composed and Printed at The University of Texas at Austin,
Marine Science Institute, Port Aransas, Texas U.S.A.

INSIDE PSAMMONALIA THIS QUARTER

OFFICERS	2
EDITORIAL	3
Meiofaunal Diversity	3
UTMSI SUPPORTS IAM	3
DUES AND MEMBER SERVICES	3
CONGRATULATIONS	4
IAM\PML GLOBAL BIODIVERSITY PROJECT	4
NEWS FROM MEMBERS	5
Tidbits	5
Address changes	5
E-Mail Addresses	6
Requests	6
RECENT LITERATURE	6
THANKS	11

This Newsletter is not part of the scientific literature for taxonomic purposes

OFFICERS**Newsletter of the International Association of Meiobenthologists**

Editor: Paul A. Montagna

Internet address: PAUL@UTMSI.ZO.UTEXAS.EDU

Production Editor: Carrol A. Simanek

Executive Committee

Paul A. Montagna, Chairperson, *Marine Science Institute, University of Texas at Port Aransas, Port Aransas TX 78373, USA*

Robert Feller, Treasurer, *Belle Baruch Institute for Marine Science and Coastal Research, University of South Carolina, Columbia SC 29208, USA*

Teresa Radziejewska, *Institute Fisheries Oceanography, Kazimiera Królewicza 4, 71-550 Szczecin, POLAND*

Yoshihisa Shirayama, *Ocean Research Institute, University of Tokyo, 1-15-1 Minamidai, Nakano-Ku, Tokyo 164, JAPAN*

James Ward, *Department of Biology, Colorado State University, Fort Collins, CO 80523 USA*

Richard Warwick, *Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth PL1 3DH, UK*

Margaret Palmer, *Department of Zoology, University of Maryland, College Park, MD 20742, USA*

Board of Correspondents

Bruce Coull, *Belle Baruch Institute for Marine Science and Coastal Research, University of South Carolina, Columbia, SC 29208, USA*

Andrew Gooday, *Institute of Oceanographic Sciences, Wormley, Godalming, Surrey, GU8 5UB, UK*

Duane Hope, *Department of Invertebrate Zoology, National Museum Natural History, Smithsonian Institution, Washington, DC 20560, USA*

Rony Huys, *Zoology Department, Natural History Museum, Cromwell Road, London, SW7 5BD, UK*

Preben Jensen, *Marine Biological Lab Helsingor, Univ. of Copenhagen, Strandpromaden 5, DK-3000 Helsingor, DENMARK*

Anton McLachlan, *Department of Zoology, University of Port Elizabeth, P.O. Box 1600, Port Elizabeth, SOUTH AFRICA*

Catalina Teresa Pastor de Ward, *Centro Nacional Patago'nico C.C. 107, (9120) Puerto Madryn, Chubut, ARGENTINA*

Donald Webb, *Department of Oceanography, Dalhousie University, Halifax, Nova Scotia, CANADA B3H 4J1*

Zhang Zhinan, *Department of Marine Biology, Ocean University Of Qindgao, Qingdao, Shangdong, PEOPLES REPUBLIC OF CHINA*

EDITORIAL

Meiofaunal Diversity

The worldwide meiofauna biodiversity study is now underway. This study was organized by the Plymouth Marine Laboratory group last year. The idea that the international meiofauna community might organize and carry out a world-wide biodiversity experiment was first proposed by Dick Warwick in February 1991 (*Psammonalia* 91). He had a good response (*Psammonalia* 92) and continued planning with a meeting of participants at the Eighth International Meiofauna Conference in August 1992. The colonization experiment consists of deploying artificial substrates in similar habitats around the world over five months. The habitat is a sublittoral rock or hard substrate at a depth of 10-15 m. In May 1993, the substrates were deployed in the northern hemisphere, and substrates are to be deployed in November 1993 in the southern hemisphere. Good luck!

There is much talk today about the importance of "biodiversity" and sustainable resources. Of course, these people are talking about tropical rain forests, birds and insects. No one who can influence policy seems to care about aquatic biodiversity, especially meiofaunal diversity. We know meiofauna are very diverse. I just sampled 10 stations in the Gulf of Mexico. In the top 2 cm of a 2.8 cm² core, we typically found 8 species of harpacticoids and 16 species of nematodes. On the California continental shelf, Frank Fiers and I found 115 species of harpacticoids and only 15 were described. All of us who have sampled meiofauna in new areas have run across many new species. Yet, a typical invertebrate zoology textbook (e.g., Barnes, 1987) reports that there is only about 7,500 species of Copepoda and 12,000 species of Nematoda. This is absurd! In his dissertation, Frank Fiers estimated that there must be closer to 750,000 species of Harpacticoida in the world based on the rate of discovery of new species. Robert May (1988, *Science* 241:1441) estimated that there are 10¹⁸ species of Nematoda on earth. All marine papers I consulted suggested that there are about 10,000 marine species. I was surprised the number is so low. I thought that there would be at least a million marine species. But, my colleagues suggest that the rate of new nematode species in samples is only 20-40%, suggesting that there may be only about 4,000 to 8,000 species left undescribed. Is this true? We urgently need a new review paper that would update the estimates on how many meiofauna species exist on earth.

If there are still many new species to be discovered, who will describe them? The state of systematics has been in decline for many years. Edward Wilson wrote and editorial in *Science* in 1985 (vol. 230) suggesting that it was time to "revive systematics." Clearly, his advice has gone unheeded. In fact, since then some museum staffs have been decimated. Is this wise? In a way it is our own fault. Many of us have derided systematics as a soft or descriptive science. This is a value judgment. We all must be more supportive of systematics or we will never gain a true appreciation of world-wide diversity.

Habitats on earth deteriorating and disappearing at an alarming rate, and perhaps some diversity on earth has already been lost. It is certainly endangered. We urgently need new studies to determine if we can still find species that were described in communities at the turn of the century. I have found it very difficult to find all the species listed from the Texas coast in papers in published the 1940's and 1950's. Have we lost diversity in shallow marine ecosystems? Wouldn't macrofauna and meiofauna communities be ideal test cases? I think the answer to both questions is yes. What do you think?

UTMSI SUPPORTS IAM

The University of Texas Marine Science Institute (UTMSI) has given a \$400 gift to the International Association of Meiobenthologists (IAM). The gift was presented to Paul Montagna by the Institute's Director, Dr. Robert Jones. The money will be used to offset publication and mailing costs for *Psammonalia*. If there are excess funds at the end of the current stewardship, then the money will be transferred to the Bertil Swedmark Fund. -ed.

DUES AND MEMBER SERVICES

Bob Feller will accept dues (10 US dollars per year) in US currency only, as the expense for conversion is prohibitive. If you are not sure if you your dues are current, check the date in the upper right hand corner of the mailing label. Please send your dues right away if you are not current. Please use the membership form at end of newsletter.

Paul Montagna requests that all members send their e-mail address or addresses to him. You can mail it or e-mail a message on bitnet: PAUL@UTMSI or internet: PAUL@UTMSI.ZO.UTEXAS.EDU

Margaret Palmer reports that she found some extra copies of the EIMCO photograph and would be happy to send them to anyone who wants one (some people had to leave the meeting early and didn't get a photo). Second, we want to encourage contributions to the Swedmark travel fund by offering to send Psammonalia tote bags to anyone who makes a contribution to the fund. Bob Feller suggests that people add a contribution (of whatever size) to their membership renewal and he will send Margaret names and addresses so she may send out tote bags. If anyone sends a contribution directly to Mike Gee or Dick Warwick, just drop me a note & I'll send you a tote bag. My e-mail address: MP3@UMAIL.UMD.EDU and my bitnet address: 209194@UMDD.

Mike Gee oversees the Bertil Swedmark fund in the U.K., the purpose of the fund is to use the accumulated interest to help students or others who wish to attend the triennial International Conference. This fund was originally donated by Bertil Swedmark. It is in a U.K. Building Society where the current rate of net interest is 4%. At present, the Fund will produce approximately £150 (~\$225 U.S. dollars at present exchange rates) over three years. 75% of this amount would not go very far to helping even one overseas student attend the conference. The fund could be increased by the further contributions or gifts from members who feel in a position to do so.

CONGRATULATIONS

Dr. Rudy L. Herman

Nominated as Vice-Director for science policy for the Flemish Government (from 1/5/93 onwards)

IAM\PML GLOBAL BIODIVERSITY PROJECT

The project is now underway and sampler packs have been sent to participants in the northern hemisphere for putting out at the beginning of May. Three replicate artificial substrate units of four pan scourers will be located at four hard bottom sites in 10-15m of water in each of the following locations:

EUROPE

Millport, Scotland (Dr. Peter Barnett); Plymouth, England (Judy Gobin); Netherlands (Dr. Carol Heip); Valencia, Spain (Santiago Moreno).

NORTH AMERICA

Hawaii (Fred Dobbs); Beruda (Dorte Wesphalen);

CARIBBEAN

Trinidad (Judy Gobin)

JAPAN - Arranged by Dr. Yoshihisa Shirayama. Hokkaido (Dr. Hiroshi Mukai); Iwate (Dr. Ichiro Takeuchi); Kumamoto (Dr. Satoshi Nojima); Okinawa (Dr. Kazuhiko Sakai).

S.E. ASIA

Thailand (Dr. Chittina Aryuthaka); Indonesia (Dr. Carol Heip)

We also have a promise of a site in Crete (Dr. Eleftheriou) for May 1994.

ASU's will be put out in the southern hemisphere on November 1st at the following locations: -

NEW ZEALAND

North and South Island (Simon Thrush)

AUSTRALIA

Rockhampton, Southern Queensland (Primitivo Aceret); Sidney, New South Wales (Warwick Nicholas); Melbourne, Victoria (Dr. Gary Poore)

AFRICA

Mombasa, Kenya (Dr. Carlo Heip); Port Elizabeth, SA (Dr. Anton McLachlan); Durban, SA (Dr. Jeannette Whitehorn); Sodwana, SA (Dr. M.H. Schleyer).

We have no locations in the latitudes above 50° and from the Atlantic and Pacific coasts on North and South America. We are also very short of global locations 10°N to 10°S of the equator. So if any members can oblige or have contacts with diving facilities in these regions could they please let the Project Coordinator know (Mike Gee, Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth PL1 3DH, U.K.) so that arrangements can be made for ASU placement in 1994.

The samples from the northern hemisphere locations will be retrieved at the end of September. So far we have had the following offers to participate in identification of various "hard bodied" groups: - mites and tegastid harpacticoids (Ilse Bartsch); other harpacticoids (Mike Gee); nematodes (Melanie Austen and Richard Warwick); caprellid amphipods (Dr. Ichiro Takeuchi); isopods (Dr. Gary Poore). We still need offers for the other meiofauna groups and for the amphipods, molluscs and polychaetes. -Mike Gee

NEWS FROM MEMBERS

Tidbits

Joan M. Bernhard,

I have just returned from a 6 month Fulbright Fellowship in Norway. I am currently a postdoc at the Wadsworth Center for Labs and Research, P.O. Box 509, Albany, NY 12201-0509. However, I will probably only be here for another 6 months, all pending grants (and job applications) of course.

Fred C. Dobbs,

Is continuing explorations into several aspects of the ecology of marine sediments, with an emphasis on the deep sea Equatorial Pacific samples (^{14}C -glutamate, ^3H -TdR and ^3H -Ade, lipids, direct counts---all from sediments) and Loihi Seamounts since going there 3 years ago. (What it all means in practical terms (as he puts it) is he busting his hump as a non-tenure researcher, self-supporting 100% and not publishing enough- ask his dean!) He is sitting more at his desk than he would like, or at sea than he would like - not enough time in the lab.

Tom Shirley,

All of our state/university telephone numbers changed recently. My telephone number is (907) 465-6449 and my FAX is (907) 465-6447. Volker Storch and I were recently in New Zealand for two weeks, collecting priapulids. We had a grand time, but unfortunately didn't find time to visit with many of our NZ colleagues. That's sufficient excuse to warrant a return trip.

Antonio Todaro,

I am currently a postdoc in the John Fleeger' laboratory at Louisiana State University. Among other "things" I am working on marine gastrotrichs (which are my first love) of the Gulf of Mexico. I recently had a brief collecting trip to South Texas driving a 1985 rusty Renault.

Antonio presented a fantastic poster with many photographs at the Benthic Ecology Meeting in Mobile, Alabama based on his recent collections. - ed.

John Coles

Writes he went to the Annual General meeting of the Ray Society at the Natural History Museum in London on the 24th of March and he quotes from the draft report of the council - about the translation of Dr. Sievert Lorenzen's work on free-living nematodes: "The publication of the volume on free-living nematodes, a translation from German and update of the work by

Sievert Lorenzen, has been delayed because of editorial problems. These problems were exacerbated by the need to find a new agent for the Society's works. However, the problems appear to have been resolved and the work should be published this year.....'

Dieter Walossek

It has been some time ago (Vienna '89) that I was asked to "invent" some more meiofauna forms from Cambrian sediments and non-arthropoda if possible. I can tell you now that we - Klaus Müller and I - were successful. From Middle-Cambrian, organic-rich limestones, we have produced small tubes that look like loricas of priapulids. It is like the one of *Tubiluchus corallicola*, having 20 regular longitudinal plates (approx. 500 μm). Being warned by Dick Warwick's comments about loriciferans (*Psammonalia* 89/1990 - we've read it, Dick!), we're still hesitating to state that they were baby priapulids, but, well, could have been. At least adult priapulids are abundant in faunas of the Middle-Cambrian Burgess Shale type, occurring in a number of species. Recently there's been evidence accumulating, that a widespread group of ancient worms with long, finely annulated and papillated tail, the palaeoscoleoids, may be related to priapulids - and these co-occur in our samples. Anyway, phosphatization of softies works out, and I'll keep you informed about our progress.

Shira Sirayma

My telephone number will change to 03-3531-6469 from 16 March local time. The new number will also accept fax transmission. My bitnet address (SIRAYAMA@JPNORIUT) will expire in February 1994 due to replacement of computer system of my institute. I will have internet address from 1994 as SIRAYAMA@AIX3.ORI.U-TOKYO.AC.JP

Address changes

Rony Huys
Zoology Department
The Natural History Museum
Cromwell Road
London SW7 5 BD
U.K.

Dr. Monika Nebelsick
Lehrstuhl für Spezielle Zoologie
Zoologisches Institut der Universität Tübingen
Auf der Morgenstelle 28
D-7400 Tübingen
GERMANY

Hiroshi Mizutani
 Department of Basic Sciences
 School of Science and Engineering
 Senshu University of Ishinomaki
 Sinmito 1, Minamisakai
 Ishinomaki, Miyagi 986
 JAPAN

Harlan Dean
 Department of Invertebrates
 Museum of Comparative Zoology
 26 Oxford St
 Cambridge, MA 02138 USA

Pamela Roe,
 Dept Biol. Sci.
 California State University
 Stanislaus, Turlock, CA 95380 USA

E-Mail Addresses

Austen, Melanie, MELA@IBMA.NERC-PML.AC.UK
 Bernhard, Joan M.,
 BERNHARD@TETHYS.PH.ALBANY.EDU
 Chandler, Tom, N420005@UNIV.BITNET
 Coull, Bruce C., N090012@UNIVSCVM.BITNET
 Dobbs, Fred C.
 DOBBS@UHUNIX.UHCC.HAWAII.EDU
 Galtsova, Valentina, ZISP.PM@PCSTI.SPB.SU
 Feller, Bob, N080005@UNIV.BITNET
 Fleeger, John, ZOFLEE@LSUVM.BITNET
 Frithsen, Jeff, 410-964-9200
 FRITHSEN.JEFF@EPAMAIL.EPA.GOV
 Gourbault, Nicole
 GOURBAUL@FRMNH11.BITNET
 Hakenkamp, Chris, 209668@UMDD.UMD.EDU
 Harlan, Dean
 SMTP%"DEAN%UMBSKY.DNET@NS.UMB.EDU"
 Higgins, Robert, MNHIV009@SIVM.BITNET
 Hope, W. Duane, MNHIV005@SIVM.SI.EDU
 Hummon, William
 HUMMON@OUVAXA.UCLS.OHIOU.EDU
 Levinton, Jeff, LEVINTON@SBBIOVM
 Li, Jian, JIAN@UTMSI.ZO.UTEXAS.EDU
 Lopez, Glenn, GLOPEZ@SBCMAIL.BITNET
 McLachlan, Alan, ZLAAAM@FS1ZOO.UPE.AC.ZA
 Montagna, Paul, PAUL@UTMSI.ZO.UTEXAS.EDU
 Palmer, Margaret, 209194@UMDD.BITNET
 Pastor de Ward, Catalina Teresa, KATTY@ATINA.AR
 Prejs, Krystyna, HYDROB@PLEARN.BITNET
 Roe, Pamela, PAM%CHEM.CSUSTAN.EDU
 Sarkka, Jukka, JSARKKA@JYLK.JYU.FI
 Schizas, Nikolaos V., JSNVS@ALASKA.BITNET
 Shirley, Tom, JFTCS@ALASKA.BITNET

Shira Sirayama
 SIRAYAMA@JPNORIXA.BITNET
 after Feb. 1994
 SIRAYAMA@AIX3.ORI.U_TOKYO.AC.JP
 Siememstad, Si, 81817@UWACDC.BITNET
 Tarjan, Charles, TARJAN@IFASGNV.BITNET
 Todaro, Antonio, ZOTODA@LSUVM.BITNET
 Tyler, Seth, TYLER@MAINE.BITNET
 Warwick, Richard, RMW@IBMA.NERC-PML.AC.UK
 Webb, Don, DGWEBB@AC.DAL.CA

Requests

Wolfgang Riess
 Are there any Mensa-members in the IAM? Mensa from Hamburg/Germany seeks contact with other Mensa's working in marine biology or other biological fields. Please send mail to: Wolfgang Riess, Hermann-Kauffmann-Strasse 42, 2000 Hamburg 50, GERMANY

NEW MEMBERS

Wolfgang Riess
 Zoologisches Institut und Museum
 c/o Prof. O. Giere
 Universität Hamburg
 Martin-Luther-King-Platz 3
 2000 Hamburg 13
 GERMANY

Wolfgang is going for his masters, working on nematodes at the tidal sand flats of the River Elbe. Studying nematodes of the genera *Tobrilus* (Andrassy 1959), particularly biomass/production-dynamics.

Nozomu Iwasaki
 Usa Marine Biological Institute
 Kocku University
 Usa-cho, Tosa
 Kochi 781-11
 JAPAN

Nozomu is studying the ecology of harpacticoid copepods, particularly intra- and interspecific relationships.

RECENT LITERATURE

Abe, H., Kito, K., Aryuthaka, C. & Tamura, H. 1993.
 Use of a photographic slide mount for nematode

- preparations. *Nematological* 39:135-.
- Akesson, B. & Rice, S.A. 1992. 2 new *Dorvillea* species (Polychaeta, Dorvilleidae) with obligate asexual reproduction. *Zoologica Scripta* 21(4):351-362.
- Alkemade, R., Wielemaker, A., DeJong, S.A. & Sandee, A.J.J. 1992. Experimental evidence for the role of bioturbation by the marine nematode *Diplolaimella dievengatensis* in stimulating the mineralization of *Spartina anglica* detritus. *Marine Ecology Progress Series* 90:149-156.
- Altenbach, A.V., Heeger, T., Linke, P., Spindler, M. & Thies, A. 1992. *Miliolinella subrotunda* (Montagu), a miliolid foraminifer building large dendritic tubes for a temporary epibenthic lifestyle. *Marine Micropaleontology* 20:293-301.
- Ansari, Z.A. & Parulekar, A.H. 1993. Environmental stability and seasonality of a harpacticoid copepod community. *Marine Biology* 115:279-286.
- Balsamo, M., Todaro, M.A. & Tongiorgi, P. 1992. Marine gastrotrichs from the Tuscan Archipelago (Tyrrhenian Sea): II. Chaetonotida, with description of three new species. *Bollettino di Zoologia* 59:487-498.
- Bernhard, J.M. 1992. Experimental and field evidence of Antarctic foraminiferal tolerance to anoxia and hydrogen sulfide. *Marine Micropaleontology* 20:203-213.
- Bird, G.J. 1992. The Tanaidacea (Crustacea) of the Faroes region (Abstract). In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991, Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn, 1992. p. 83.
- Bogitish, B.J. 1993. A comparative review of the flatworm gut with emphasis in the Rhabdocoela and Neodermata. *Transactions of the American Microscopical Society* 112(1):1-9.
- Bowser, S.S., Alexander, S.P., Stockton, W.L. & DeLaca, T.E. 1992. Extracellular matrix augment mechanical properties of pseudopodia in the carnivorous foraminiferan *Astrammmina rara*: role in prey capture. *Journal of Protozoology* 39:724-732.
- Bowser, S.S. & Bernhard, J.M. 1993. Structure, bioadhesive distribution and elastic properties of the agglutinated test of *Astrammmina rara* (Protozoa: Foraminiferida). *J. Euk. Microbiology* 40(2):121-131.
- Brasier, M.D. & Green, O.R. 1993. Winners and losers: stable isotopes and microhabitats of living Archaiadae and Eocene Nummulites (larger foraminifera). *Marine Micropaleontology* 20:267-276.
- Burke, S.K., Berger, W.H., Coulbourn, W.T. & Vincent, E. 1993. Benthic foraminifera in box core ERDC 112, Ontong Java Plateau. *Journal of Foraminiferal Research* 23(1):19-39.
- Buzas, M.A., Culver, S.J. & Jorissen, F.J. 1993. A statistical evaluation of the microhabitats of living (stained) infaunal benthic foraminifera. *Marine Micropaleontology* 20:311-320.
- Carey, P.G. 1992. *Marine Interstitial ciliates*. New York: Chapman & Hall, p. 496.
- Chardy, P. & Dauvin, J.-C. 1992. Carbon flows in a subtidal fine sand community from the western English Channel: a simulation analysis. *Marine Ecology Progress Series* 81:147-161.
- Chen, G.T., Vincx, M. & Heip, C. 1992. Study on ecological monitoring using meiobenthos in Southern Bight of North Sea (In Chinese with English Abstract). *Marine Science Bulletin* 11(5):54-58.
- Clausen, C. 1992. *Macrodasyid gastrotricha* from the Faroe bank (Abstract). In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991, Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992. p. 87.
- Clausen, C. 1992b. Faroe bank gastrotrichs (Abstract). In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991, Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992. p. 87.
- Coineau, N. 1992. Biogéographic évolutive du Crustacé interstitial *Microcharon* (Isopoda, Janisoidea) dans l'ouest du bassin Méditerranéen. *Bull. Inst. Océanogr. Monaco* 9:101-114.
- Coineau, N. & Boutin, C. 1992. Biological processes in space and time colonization evolution and speciation in interstitial stygobionts. In: Camacho, A.I. (ed.), *The Natural History of Biospeleology*. Madrid: Mus. Nat. Cie. Nat. C.S.I.C., pp. 423-451.
- Coull, B.C. & Chandler, G.T. 1992. Pollution and meiofauna: Field, laboratory and mesocosm studies. *Oceanography and Marine Biology Annual Reviews* 30:191-271.
- Dahms, H.-U. 1993. Naupliar development of *Scutellidium hippolytes* (Copepoda, Harpacticoida) and a comparison of nauplii within Tisbidae. *Hydrobiologia* 250:1-14.
- Dahms, H.-U. 1993. Comparative copepodid development in *Tisbidimorpha sensu* Lang 1948 (Copepoda, Harpacticoida) and its bearing on phylogenetic considerations. *Hydrobiologia* 250:15-38.
- Dahms, H.-U. 1993. Meiofaunauntersuchungen in der Hochantarktis. *Natur und Museum* 123(1):1-36.
- Dahms, H.-U. & Fernando, C.H. 1992. Naupliar

Wiese
 →
 ! X
 Har. Ecol.
 og. Sci.
 3(2-3)
 1992,
 263!

X

- development of *Mesocyclops aequatorialis similis* and *Thermocyclops consimilis* (Copepoda: Cyclopoida) from Lake Awasa, a tropical rift valley lake in Ethiopia. *Canadian Journal Zoology* 70:2283-2297.
- Dahms, H.-U. & Fernando, C.H. 1993. Naupliar development of *Mesocyclops cf. thermocyclopoides* Harada, 1931 and *Thermocyclops decipiens* (Kiefer, 1929) (Copepoda: Cyclopoida) from Beira Lake, Sri Lanka. *Journal of Plankton Research* 15(1):9-26.
- Danielopol, D. & Wouters, K. 1992. Evolutionary (paleo)biology of marine interstitial ostracoda. *Gebios* 25:207-211.
- D'Addabbo, Gallo M de Grimaldi S, Morone de Lucia RM, Troccoli, A. 1992. Halechiniscidae and Echiniscoididae from the western Mediterranean Sea (Tardigrada: Heterotardigrada). *Cahiers de Biologie Marine* 33(3):299-318
- Erseus, C. 1992. Groundwater and marine intertidal Tubificidae (Oligochaeta) from the Canary Islands and Cabo Verde Islands, with descriptions of 2 new species. *Bijdragen Tot De Dierkunde* 62(2):63-70.
- Fang, H.Y. 1992. Benthic foraminifera in the surface sediments of the Minnan-Taiwan bank region and its environmental characteristics (In Chinese with English Abstract). *Tropic Oceanology* 11(2):54-61.
- Fenchel, T. 1992 May 93. What can ecologists learn from microbes: life beneath a square centimetre of sediment surface. *Functional Ecology* 6:499-507.
- Fenchel, T. 1993. Methanogenesis in marine shallow water sediments: the quantitative role of anaerobic protozoa with endosymbiotic methanogenic bacteria. *Ophelia* 37:67-82.
- Fiers, F. 1992. A redescription of *Hemilaophonte janinae* Jakubisiak (Copepoda, Harpacticoida), a Laophontid living in the gill of the common spider crab. *Belgian Journal of Zoology* 122(2):211-222.
- Fiers, F. 1992. *Robustunguis* gen. nov., a genus of decapod associated Laophontids (Copepoda: Harpacticoida). *Zoologische Mededelingen* 66:399-412.
- Flössner, D. 1970. *Moraria fontinalis* n. sp. (Crustacea, Copepoda) Ein neuer Ruderfußkrebs aus dem Grundwasser Thüringens. *Limnologica* (Berlin) 7(2):273-278.
- Flössner, D. 1992. A new genus and a new species of freshwater Canthocamptidae (Copepoda: Harpacticoida) from wet mosses of Canada. *Hydrobiologia* 234:7-14.
- Fossa, J.H., Brattegard, T. & Westerberg, H. 1992 Faunal groups related to distribution of water masses in Faroese waters (Abstract); In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1992: Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992; 76-77
- Gallo, M.D., Grimaldi, S.D., Delucia, R.M.M. & Troccoli, A. 1992. Halechiniscidae and Echiniscoididae from the western Mediterranean Sea-(Tardigrada, Heterotardigrada). *Cahiers De Biologie Marine* 33(3):299-318.
- Gooday, A.J. & Fernando, O. 1992. A new allogromiid genus (Rhizopoda: Foraminiferida) from the Vellar Estuary, Bay of Bengal. *Journal of Micropaleontology* 11:233-239.
- Gross, O. & Thiel, H. 1992. The distribution of meiofauna along a depth transect in the Faroe-Shetland Channel (Abstract). In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991 Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1991-92
- Hallock, P. & Peebles, M.W. 1993. Foraminifera with chlorophyte endosymbionts: Habitats of six species in the Florida Keys. *Marine Micropaleontology* 20:277-292.
- Hertel, L.A. 1992. Excretion and osmoregulation in the flatworms. *Transactions of the American Microscopical Society* 112:10-17.
- Hicks, G.R.F. 1992. Tidal and diel fluctuations in abundance of meiobenthic copepods on an intertidal estuarine sandbank. *Marine Ecology Progress Series* 87:15-21.
- Hummon, W.D., Balsamo, M. & Todaro, M.A. 1992. Italian marine Gastrotricha: I. Six new and one redescribed species of Chaetonotida. *Boll. Zool* 59:499-516.
- Hummon, W.D., Todaro, M.A. & Tongiorgi, P. 1993. Italian marine Gastrotricha: II. One new genus and ten new species of Macrotrichida. *Bol. Zool.* 60:109-127.
- Hunt, A.S. & Corliss, B.C. 1993. Distribution and microhabitats of living (stained) benthic foraminifera from the Canadian Arctic Archipelago. *Marine Micropaleontology* 20:321-345.
- Jensen, P. 1992. *Cerianthus vogti* Danielssen, 1890 (Anthozoa: Ceriantharia). A species inhabiting an extended tube system deeply buried in deep-sea sediments off Norway. *Sarsia* 77:75-80.
- Jensen, P., Emrich, R. & Weber, K. 1992. Brominated metabolites and reduced numbers of meiofauna organisms in the burrow wall lining of the deep-sea enteropneust *Stereobalanus canadensis*. *Deep-Sea Research* 39:1247-1253.
- Jensen, P., Rumohr, J. & Graf, G. Sedimentological and biological differences across a deep-sea ridge exposed to advection and accumulation of fine-grained

- particles. *Oceanologica Acta* 15:287-296.
- Jonasson, K.E. & Patterson, R.T. 1992. Preservation potential of salt marsh foraminifera from the Fraser River delta, British Columbia. *Micropaleontology* 38:289-301.
- Kamiya, T. & Hazel, J.E. 1992. Shared versus derived characters in the pore-system of *Loxoconcha* (Ostracoda, Crustacea). *Journal of Micropalaeontology* 11:159-166.
- Keats, D.W. & Steele, D.H. 1993. Food of O-group ocean pout [*Macrozoarces americanus* (Schneider)] in eastern Newfoundland: the importance of harpacticoid copepods. *Journal of Fish Biology* 42:145-148.
- Kepper, E.J. 1992. Eleven new species of the free-living marine nematodes of the genus *Halalaimus* De Man, 1988 (Nematoda: Enoplida) from Florida with keys to the species. *Gulf Research Reports* 8:333-362.
- Kitazato, H. & Ohga, T. 1992. In situ observation of sediment-water interface and culture experiment of benthic foraminifera at Sagami Bay; In: Proceedings of JAMSTEC Symposium on deep sea research. No. 8; Technical report of the Japan marine science technology center, Special Issue, December 1992 199-208
- Kornicker, L.S. 1992. *Mydocopid ostracoda* of the Benthedi Expedition, 1977, to the NE Mozambique Channel, Indian Ocean. In: (ed.), Smithsonian Contribution to Zoology. Washington: Nat. Mus. of Nat. Hist.
- Kouyoumontyakis, G. 1992. Le plateau continental Gabonais: associations de foraminifères benthiques. *Revue de Micropalaeontologie* 35:271-282.
- Knudsen, K.L. 1992. Foraminifera in palaeoecology (Abstract); In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991; Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992; 85
- Kristensen, R.M. 1992. The meiobenthic fauna of the Faroe Bank (Abstract); In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1992; Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992; 86-87
- Langer, M. 1993. Epiphytic foraminifera. *Marine Micropaleontology* 20:235-265.
- Langer, M. & Gehring, C. 1993. Bacteria farming: A possible feeding strategy for some smaller, motile foraminifera. *Journal of Foraminiferal Research* 20:215-234.
- Leguellec, C. & Bodin, P. 1992. Meiobenthos of the Bay of Saint-Brieuc (North Brittany, France) 1. Quantitative distribution in subtidal and intertidal zones. *Oceanologica Acta* 15:661-673.
- Libertini, A. & Lazzaretto, I. 1993. The karotype in an Antarctic harpacticoid copepod -*Dadylopodia* sp. *Polar Biology* 13:101-104.
- Linke, P. & Lutze, G.F. 1993. Microhabitat preferences of benthic foraminifera - a static concept or a dynamic adaptation to optimize food acquisition. *Marine Micropaleontology* 20:215-234.
- Loubere, P., Gary, A. & Lagoe, M. 1993. Generation of the benthic foraminiferal assemblage: Theory and preliminary data. *Marine Micropaleontology* 20:165-181.
- McMinn, A. 1992. Cobricosphaeridium Harland and Sarjeant: Dinoflagellate cyst or copepod egg?. *Micropaleontology* 38:315-316.
- Miliou, H., Moraitou-Apostolopoulou, M. & Argyridou, M. 1992. Biochemical composition of *Tisbe holothuriae* (Copepoda: Harpacticoida) and its differentiation in relation to developmental stages. In: (ed.), Smithsonian Contributions to Zoology. Washington: Nat. Mus. of Nat. Hist. Smithsonian Inst., pp. 159-166.
- Morand, S. 1993. Sexual transmission of a nematode - study of a model. *Oikos* 66(1):48-64.
- Nebelsick, M. 1992. Ultrastructural investigation of 3 taxonomic characters in the trunk region of *Echinoderes capitalus* (Kinorhyncha, Cyclorhagida). *Zoologica Scripta* 21(4):335-346.
- Nicholas, W.L. 1991. Interstitial Meiofauna. In: Bryant, C. (ed.), Metazoan Life without oxygen. New York: Chapman & Hall, p. 320.
- Nigam, R. & Khare, N. 1992. The reciprocity between coiling direction and dimorphic reproduction in benthic foraminifera. *Journal of Micropalaeontology* 11:221-228.
- Palerud, R. 1992. Amphipods of the Faroes: Patterns of distribution related to depth and water masses (Abstract); In: Symposium on marine biology and oceanography of the Faroe Islands. Nordurlandahusid, Torshavn, Faroe Islands 16-20 September 1991; Arbok (Yearbook) 1991-92 Nordurlandahusid i Foroyum Torshavn 1992; 83-84
- Palmer, M.A. 1993. Experimentation in the hyporheic zone: challenges and prospectus. *J.N. Am. Benthol. Soc.* 12(1):84-93.
- Pawlowski, J., Zaninetti, L., Whittaker, J. & Lee, J.J. 1992. The taxonomic status of the minute foraminifera *Discorbina minutissima* Chaster (1892), *D. chasteri* Heron-Allen & Earland (1913) and related species. *Journal of Micropalaeontology* 11:127-134.
- Petkovaski, T. & Keyser, D. 1992. *Leptocythere ostrorskensis* sp. n. (Crustacea, Ostracoda, Cytheridae) aus dem See Vegoritis (Ostrorsko Ezero) in NW

- Griechenland. Mitt. hamb. zool. Mus. Instit. 89:227-237.
- Prejs, K. 1993. Distribution and feeding of the predatory nematode *Anatonchus dolichurus* (Mononchoidea) in the Dokka Delta (Norway) and its impact on benthic meiofauna. *Freshwater Biology* 29:71-78.
- Proctor, H.C. 1992. Discord between field and laboratory sex ratios of the water mite *Neumania papillator* Marshall (Acari: Unionicolidae). *Canadian Journal of Zoology* 70:2483-2486.
- Reid, J.W. & Ishida, T. 1993. New species and new records of the genus *Elaphoidella* (Crustacea: Copepoda: Harpacticoida) from the United States. *Proceedings of the Biological Society of Washington* 106:137-146.
- Robinson, A.F. & Heald, C.M. 1993. Movement of *Rotylenchus reniformis* through sand and agar in response to temperature, and some observation on vertical descent. *Nematologica* 39:92-103.
- Rouch, R. 1992. *Parastenocaris mangini* n. sp., new harpacticoid (Copepoda) stygobiont of the Pyrenees. *Crustaceana* 63(3):306-312 (in French).
- Rouse, G.W. 1993. *Amphiglena terebro* sp. nov. (Polychaeta: Sabellidae: Sabellinae) from eastern Australia; including a description of larval development and sperm ultrastructure. *Ophelia* 37:1-18.
- Schöpf, J.W. 1993. Microfossils of the early Archean Apex Chert: new evidence of the antiquity of life. *Science* 260:640-646.
- Sen Gupta, B.K. & Machain-Castillo, M.L. 1993. Benthic foraminifera in oxygen-poor habitats. *Marine Micropaleontology* 20:183-201.
- Shinn, G.L. 1992. Formation of egg capsules by flatworms (Phylum Platyhelminthes). *Transactions of the American Microscopical Society* 112:18-34.
- Shirayama, Y. Studies of meiofauna collected from the Iheya Ridge during Dive 541 of the "SHINKAI 2000". In: *Proceedings of JAMSTEC Symposium on deep sea research, No.8; Technical report of the Japan marine science technology center, Special Issue, December 1992*
- Simenstad, C.A. & Cordell, J.R. 1992. Species and assemblage diversity of nearshore epibenthic harpacticoid copepods - natural and human influences. *Northwest Environmental Journal* 8(1):154-155.
- Smith, H.G. 1992. Distribution and ecology of the testate rhizopod fauna of the continental Antarctic zone. *Polar Biology* 12:629-634.
- Smith, K.L. 1992. Benthic boundary layer communities and carbon cycling at abyssal depth in the central North Pacific. *Limnology and Oceanography* 37:1034-1056.
- Song, W.B. 1992. A new marine ciliate, *Zoothamnium penaei* sp. nov. (Ciliophora, Peritrichida) (In Chinese with English Abstract). *Oceanologia ET Limnologia Sinica* 23(1):90-94.
- Steward, C.C., Pinckney, J., Piceno, Y. & Lovell, C.R. 1992. Bacterial numbers and activity, microalgal biomass and productivity, and meiofaunal distribution in sediments naturally contaminated with biogenic bromophenols. *Marine Ecology Progress Series* 90:61-72.
- Thistle, D., Hilbig, H. & Eckman, J.E. 1993. Are polychaetes sources of habitat heterogeneity for harpacticoid copepods in the deep sea. *Deep-Sea Research* 40:151-158.
- Thomsen, L. & Altenbach, A.V. 1993. Vertical and areal distribution of foraminiferal abundance and biomass in microhabitats around inhabited tubes of marine echinurids. *Marine Micropaleontology* 20:303-309.
- Todaro, M.A. 1992. Contribution to the study of the Mediterranean meiofauna: Gastrotricha from the Island of Ponza, Italy. *Boll. Zool* 59:321-333.
- Todaro, M.A., Balsamo, M. & Tongiorgi, P. 1992. Marine gastrotrichs from the Tuscan Archipelago (Tyrrhenian Sea) 1. Macrotricha, with description of 3 new species. *Bollettino di Zoologia* 59:471-486.
- van Harten, D. 1992. Hydrothermal vent ostracoda and faunal associations in the deep sea. *Deep-Sea Research* 39:1067-1070.
- Vandebund, W.J. & Davids, C. 1993. Complex relations between freshwater macrobenthos and meiobenthos - interactions between *Chironomus riparius* and *Chydorus piger*. *Freshwater Biology* 29:1-6.
- Vanhove, S., Vincx, M., Vangansbeke, D., Gijssels, W. & Schram, D. 1992. The meiobenthos of 5 mangrove vegetation types in Gazi Bay, Kenya. *Hydrobiologia* 247:99-108.
- Vanreusel, A., Vincx, M., Vangansbeke, D. & Gijssels, W. 1992. Structural analysis of the meiobenthos communities of the shelf break area in 2 stations of the Gulf-of-Biscay (NE Atlantic). *Belgian Journal of Zoology* 122(2):185-202.
- Vørs, N. 1992. Heterotrophic amoebae, flagellates and heliozoa from the Tvärminne area, Gulf of Finland, in 1800-1900. *Ophelia* 36:1-109.
- Watson, N.A. & Rohde, K. 1992. Ultrastructure of the pharynx of *Prorhynchus* (Platyhelminthes, Lecithoepitheliata). *Zoologica Scripta* 21(4):325-334.
- Wharton, D.A. & Barclay, S. 1993. Anhydrobiosis in the free-living antarctic nematode *Panagrolaimus davidi* (Nematoda, Rhabditida). *Fundamental and Applied Nematology* 16(1):

Wu, B.L., Zhao, J. & Westheide, W. 1993. A new species of meiofauna polychaete *Microphthalmus* from Yellow Sea (Polychaeta:Hesionidae) (In Chinese with English Abstract). *Acta Zootaxonomica Sinica* 18(1):1-4.

THANKS

This issue of *Psammonalia* came about due to the efforts of many individuals. The editorial staff thanks the following members for their contributions:

M. Palmer
J. W. Cole
Bruce Coull
Preben Jensen
Zhang Zhinan
James Ward
Andrew Gooday
Mike Gee
Robert Feller
Nicole Coineau
Donald Zinn
Rony Huys

1. Introduction

The purpose of this document is to provide a comprehensive overview of the project's objectives, scope, and timeline. This document will serve as a reference for all stakeholders involved in the project.

The project is designed to address the current challenges faced by the organization and to implement a solution that meets the needs of our customers and stakeholders.

The project will be managed in accordance with the principles of transparency, accountability, and collaboration. We will ensure that all team members are kept informed and have the opportunity to contribute their expertise.

The project team consists of experienced professionals from various departments, including marketing, sales, and operations. We are confident that our diverse skill set will enable us to successfully complete the project.

The project timeline is as follows: Phase 1 (Planning) - 4 weeks, Phase 2 (Development) - 8 weeks, Phase 3 (Testing) - 4 weeks, and Phase 4 (Deployment) - 2 weeks. We will provide regular updates on the project's progress.

We will maintain open communication with all stakeholders throughout the project. Your feedback and input are highly valued and will be used to refine the project as needed.

The project budget is within our allocated resources, and we will ensure that all costs are tracked and reported on a regular basis. We are committed to delivering high-quality results within the specified budget.

We will conduct regular status meetings to discuss the project's progress, address any issues, and make necessary adjustments. Your participation and support are essential for the project's success.

The project is a strategic initiative for our organization, and we are excited to embark on this journey. We will work together to overcome any challenges and achieve our shared goals.

We will continue to provide updates and reports as the project progresses. Thank you for your interest and support.

International Association of Meiobenthologists

Application for Membership or Renewal

The International Association of Meiobenthologists is a non-profit scientific society representing meiobenthologists in all aquatic disciplines. The Association is dedicated to the dissemination of information by publishing a quarterly newsletter and sponsoring a triennial International Conference. The newsletter, *Psammonalia*, is published mid-month in February, May, August and November. The next International Conference will be in the summer of 1995.

Membership is open to any person who is actively interested in the study of meiofauna. Annual membership dues are \$10 US and you may pay up to 3 years in advance, i.e., \$30. New members will receive *Psammonalia* beginning with the February issue of the current year. If you are able, please add extra money to be contributed to the Bertil Swedmark Fund, which is used to help students or others who wish to attend the triennial International Conference.

Please check appropriate box:

New member Renewing member

Name _____

E-mail network _____

Address _____

E-mail address _____

FAX number _____

City, St/Prov _____

Telephone _____

Zip/Postal Code _____

Country _____

\$US _____ enclosed for ____ years membership at \$10/year.

\$US _____ enclosed to contribute to the Bertil Swedmark Fund.

\$US _____ TOTAL

Dues must be paid in US dollars. Make checks payable to Int. Assoc. of Meiobenthologists. Send dues and applications to:

Dr. Robert Feller
Belle W. Baruch Institute
Univ. of South Carolina
Columbia, SC 29208 USA

Dear Sir,

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above mentioned matter.

The same has been referred to the proper authorities for their consideration and they will be glad to hear from you again.

I am, Sir, very respectfully,
Your obedient servant,

J. H. [Name]

Enclosed for you are the documents mentioned in your letter of the 10th inst.

I am, Sir, very respectfully,
Your obedient servant,

J. H. [Name]