

# PSAMMONALIA

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*Shirayama! Laurence  
Strayer!*

Dear Friends,

most of you working on meiofauna will have experienced this situation: You explain to your relatives/friends what you are doing, with what you earn your living (and your travelling to exotic places like Tampa) - and their response finally is: "Well, very interesting, your work, but what good is it?" There you are with your sophisticated methods, your ingenious statistical treatment, your latest results on aberrations in the posterior hair setae or the diurnal migrations through a centimeter of mud - what is the benefit?

Well, of course you can tell now the old story of meiofauna as the indispensable link between microbes and man - but does this really hold on a general basis? Aren't many meiobenthic animals just trophic dead ends, linked in short-cut food chains, from bacteria to meiobenthos and retour?

Another way how to get out of this uneasy situation (and one which proves you are familiar with Alice in Wonderland and other philosophers!): You baffle your people who question your professional existence so impertinently with a beautiful and for me almost classical counter - as N. RISER (1985) put it when asked what a nemertean was good for: "If it could speak, it would ask the same question about you!" But, unmasking the inherent unreflected anthropocentrism of this question will get you into endless philosophical discussions or even religious debates, anyway, trouble is arising.

Of course, there are the lucky ones among us (and there were times when I belonged to them, so I know) who study the impact of oil/cadmium/acid rain/mankind on harpacticoids/nematodes or other poor critters. Here's how it goes: ..."early warning systems", "rapid turnover", "quick results", better to keep in the lab than cows, cod and cockroaches". Good arguments which will convince fund givers and, with some results at hand, even politicians (given that the developmental cycle of your animals is shorter than the election period).

So, why not merely do applied science? Why not throw overboard these useless playgrounds of cranky scientists, abandon these "orchid disciplines", as we use to say in Germany, and only work on the real

the useful problems which answer the actual needs of mankind? - Exactly these are considerations favoured by many research councils and governments (not only in the poorer countries!). They are led by the belief that basic science is a luxury, not to afford in harsh times. ("Let's save all that money and support only those fields which we can see are useful".)

However, it is just this attitude which will stifle, on the long run, real scientific progress with all its beneficial side effects even for applied research! Look around and look back - the big steps forward in science, not only in biology, have been and will be done in basic science. They originated from the open and unforced mind of scientists who understood to blend the hard facts (the basic ingredients) in a consequent, cunning, but not always logical way (the proper mixing) with sudden ideas (the spices), added some serendipity (the culinary surprise) - and out came masterworks of scientific table d'hôte meals, contributions to the 'haute cuisine' while many others continue to stir their invariable canteen food which will end up in the usual everyday stew.

Surveys, expertises, contracts and test series on possible ecological hazards - they are important for an ever more threatened environment, but they are not the stuff of which new breakthroughs are made. And the head of a government or institution will certainly dig up a lot of fund money with his applied projects and perhaps even earn some short-lived reputation with more pollution data, new and more sophisticated machinery, but he will not promote long-lasting research progress, set new scientific frontiers.

The applied scientist often becomes degraded to a performer of contracts, the punctual, busy collector of computerized data, the pack-mule of science, with voluminous reports as his scientific highlights. This industrious output, filled with endless tables, this hardly publishable work is found more often in the drawers of offices, the departments and courts than in scientific journals. In vain you will search for basically new scientific findings in these compulsory exercises of patient clerks. They are necessary, I know. But even a good musician who daily has to play only his dictated notes in the orchestra will never compose a new symphony, not even a tiny elegant sonata.

Well, most of you will know all this.

Furthermore, these lines are not at all meant to criticize the work of those colleagues who have to do applied studies. However, not only the decision makers in science, all those having to do with refereeing projects, have to determine the scientific future of an institute or a major campaign, no, all of us should keep in mind: When finances get tighter, it is often the 'uselessness' of basic, 'free' science which is at stake, which is first to be sacrificed.

Well, to come back to the beginning: what to tell now your friends, the others, the "what good is it-society" who tends to see first and only the monetary benefit of your research, its direct, practical use? You cannot claim the intrinsic value of augmenting knowledge in all fields, man's inherent striving for cognition! No, I think you must have good examples at hand, easy to accept even by the most short-sighted pragmatist. I tend to cite KEPLER who, beside being a renowned astrologist, played around with some useless, theoretical calculations for ellipses etc - at present no satellite would be at its celestial position without the work of this man. Or take RÖNTGEN who saw the bones of his hand when by chance reaching into the beam of his newly invented X-rays, which were to revolutionize medicine all over the world. You want a more biological example? Think of GREGOR MENDEL, the monk, who in his

monastery's garden was curious to find out "why on earth (or in heaven?) flower these peas red, and those over there white?" Without his little experiments, his for many years forgotten 'laws', modern genetics is hard to imagine.

So, try to find your striking example, there are plenty around. Not, that we believed "without meiofauna - no modern biology" or the like, but "without basic, non-applied, even playful scientific reasoning and experimenting ("useless", if you want so) - no real progress, even in a practical world!

By the way, there is another good answer to these inquiring "what good"-questions, but it sounds too snobby and I hardly dare to tell you: "Because to me it's fun!"

Funny, but true!  
Yours sincerely



Olav Giere

PRODUCTION OF UNIVERSITIES

"Universities do not have to present pre-calculated results like an industrial production plant. Research and teaching cannot be produced efficiently according to economic laws like eggcups or machine tools."

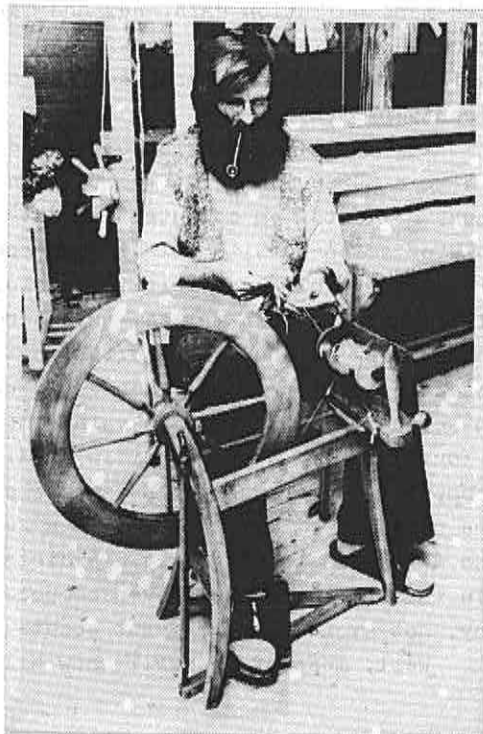
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FOR NEWS ON THE SIXTH INTERNATIONAL  
MEIOFAUNA CONFERENCE (SIMCO) IN  
TAMPA (FLORIDA), JULY 13 - 19, 1986  
SEE PAGE 4!

TWISTED SCIENCE

There was this nematodologist,  
Who studied the secret of nematodes' twist.  
Why clockwise in Greenland,  
Reversed in New Zealand?  
He gave up and is now psychologist!

(Preben, we don't mean you!)



vågn (nema)

ADDITIONAL INFORMATION ON SIMCO

(see PSAMMONALIA 69 - 71 for other information)

- 1. REMEMBER: Deadline for registration - June 1
- Deadline for room reservation - June 30
- We urge you to read 'Meiobenthic Advice' on p. 5!

2. Following is the schedule for oral contributed papers and meeting activities for SIMCO. Presentations will be 25 minutes long, with 20 minutes presentation and 5 minutes for questions. All papers will be presented in English. Abstracts will be distributed at the meeting. Note that "workshops" have been scheduled for Saturday AM. So far, a request for a 'copepod feeding' workshop has been received. Participants are requested to organize their own informal workshops on Saturday (as was done at VIMCO). Rooms will be arranged as necessary. Also a trip to a Floridian seagrass bed has been arranged for Saturday late AM and early PM. Interested persons should bring masks and snorkels, etc. Lunch will be provided. A fee of \$ 5-10.00 will be charged. Persons can sign up at registration in July.

3. Activities for spouses are being planned during the meeting if there is enough interest. Please, let S.S. BELL know if you are interested in participating.

4. Late papers can be accomodated in the poster session. Notify S.S. BELL.

5. A meiofauna contest will be held on Tuesday afternoon with a prize being awarded to the person who best identifies meiofauna taxa from the exquisite illustration on the SIMCO T-shirts (courtesy of R. HIGGINS).

6. No telephones are available in individual rooms at the USF Village. However, the reception office is open 24 hrs for check-in and as an information center. Messages can be left at the reception center (813)974-3645 for participants if necessary. Other phone numbers which might be useful:

SIMCO convenor: S.S. BELL  
 (813)974-2677 office  
 (813)988-3689 home

USF Biology Department  
 (813)974-3250

TENTATIVE SIMCO SCHEDULE OF ORAL PRESENTATIONS

July 13 Sunday

13:00 - 20:00 Registration; Check In  
 19:00 - ?? Beer Blast (USF Sundome - Green and Gold Room)

July 14 Monday

09:00 Announcements  
 09:05 Opening Remarks  
 09:30 SHERMAN, K.M. (USA) The organization of an ecologically simple assemblage: the epifaunal nematodes of bay scallops.  
 09:55 WALTERS, K. (USA) Active migration: a method of dispersal for harpacticoid copepods?  
 10:20 Coffee Break  
 10:45 SHIRAYAMA, A.C. (Japan) Rates of respiration and ingestion of deep-sea meiobenthos collected in Suruga Bay, Central Japan.  
 11:10 MORRILL, A.C.; E.N. POWELL & J.M. SCHICK (USA) Oxygen/peroxide detoxification in oxybiotic and thiobiotic meiofauna.  
 11:35 POWELL, E.N.; C. FOX & M. MEYERS (USA) Are thiobios aerobic sulfide-loving meiofauna?  
 12:00 Lunch  
 14:00 THIEL, H. & O. PFANNKUCHE (FRG) Mesoscales of meiofauna distribution and environmental factors in the deep-sea.  
 14:25 GUIDI, L. (France) Meiofauna in a Mediterranean canyon.  
 14:50 THISTLE, D. & J.E. ECKMAN (USA) Why infaunal harpacticoids occur around a surface structure.  
 15:15 Coffee Break  
 15:40 GOODAY, A.J. & N.G. CARTWRIGHT (UK) Meiofaunal Foraminifera from the bathyal and abyssal N.E. Atlantic.  
 16:05 SCHRIEVER, G. (FRG) First results of deep-sea Harpacticoida investigations in the western European Atlantic including comparison of two sampling methods.  
 16:30 CARTWRIGHT, N.G. & A.R. JONES (UK) Metal analysis of selected Foraminifera from the N.E. Atlantic.  
 19:00 Cookout (location to be announced)

July 15 Tuesday

09:00 Announcements  
 09:05 COULL, B.C. (USA) What do we know after 13 years of meiofauna studies in North Inlet, South Carolina?  
 09:30 WIDBOM, B. & R. ELMGREN (Sweden) Benthic meiofauna in nutrient enriched marine ecosystems.  
 09:55 AUSTEN, M.C. & R.M. WARWICK (UK) Factors affecting complex community structure of estuarine meiofauna: a microcosm approach.  
 10:20 Coffee Break

SIMCO Schedule of oral presentations, cont'd:

- 10:45 FELLER, R.J. (USA) "Out, damned spot, out, I say..." (Lady Macbeth): does fish predation control salt marsh meiofaunal abundance?
- 11:10 GEE, J.M. (UK) The impact of predation by epibenthic predators on the harpacticoid copepod populations of sandy and muddy intertidal estuarine habitats.
- 11:35 TIPTON, K. (USA) The feeding ecology of two Syngnathidae from a Florida seagrass bed with special reference to harpacticoid copepods.
- 12:00 Lunch
- 14:00 SMITH, L.D. & B.C. COULL (USA) Juvenile spot (Pisces) and grass shrimp predation on meiofauna in muddy and sandy substrates.
- 14:25 PALMER, M.A. (USA) Hydrodynamics, structure and meiofauna dispersal.
- 14:50 BELL, S.S. (USA) Inference space and meiofaunal experimentation: questions and suggestions.
- 15:15 Coffee Break

Poster Session and Meiofauna Contest

July 16 Wednesday

- 10:00 Bus to Busch Gardens
- 19:30 Bus returns to USF

July 17 Thursday

- 09:00 Announcements
- 09:05 Invited Lecture: R. PENNAK (USA) Meiobenthic anomalies and rarities in fresh waters.
- 09:45 PERLMUTTER, D.G. & E.C. O'DOHERTY (USA) A review of stream meiofauna.
- 10:10 Coffee Break
- 10:35 STRAYER, D. (USA) Roles of the meiofauna in lacustrine ecosystems.
- 11:00 HUMMON, M.R. (USA) Experiments on sexual reproduction in a freshwater gastrotrich.
- 11:25 HIGGINS, R.P. & R.M. KRISTENSEN (USA/Denmark) Scaldid ontogeny in Pycnophyes (Kinorhyncha:Homalorhagida).
- 11:50 Lunch
- 14:00 CHANDLER, G.T. & J.W. FLEEGER (USA) Facilitative and inhibitory interactions among meiofauna with errant and semi-sessile life styles.
- 14:25 BERGMANS, M. (Belgium) Life history of Tisbe pori (Harpacticoida): A search for reproductive costs and lmc-related facultative sex ratios.
- 14:50 HALL, M.O.; S.S. BELL & K. WALTERS (USA) Habitat utilization by harpacticoid copepods: a morphometric approach.
- 15:15 Coffee Break
- 15:40 I.A.M. Business Meeting
- 18:30 Reception - University Center
- 19:30 Banquet - University Center

July 18 Friday

- 09:00 Announcements
- 09:00 GIÈRE, O. (FRG) Mutualistic aspects in the association of gutless meiobenthic oligochaetes with sulfur bacteria, with evidence for a regular transfer of symbiotic prokaryotes.
- 09:30 DECHO, A.W. (USA) Ontogenetic feeding shifts in larval vs. adult harpacticoid copepods.
- 09:55 MONTAGNA, P.; J. BAUER; D. HARDIN & R. SPIES (USA) Meiofaunal and microbial trophic interactions at a California oil seep.
- 10:20 Coffee Break
- 10:45 DECKER, C.J. (USA) Food patch selection behavior in a harpacticoid copepod species.
- 11:10 SERVICE, S.K. (USA) The use of a null model to assess patterns of size class migrations of the copepod, Zausodes arenicolus.
- 11:35 HICKS, G.R.F.; S.S. BELL & K. WALTERS (New Zealand/USA) Movement of copepods in seagrass beds: a New Zealand and Floridian comparison.
- 12:00 Lunch
- 14:00 FLEEGER, J.W.; G.T. CHANDLER & J. WILLIAMS-HOWZE (USA) Tube building harpacticoid copepods: an update.
- 14:25 REISE, K. (FRG) Variability in a sand-dwelling assemblage of marine Plathyhelminthes.
- 14:50 MARINELLI, R.L. & B.C. COULL (USA) Structural complexity and juvenile fish predation on meiobenthos: an experimental approach.
- 15:15 Coffee Break
- 15:40 MEYERS, M.; H. FOSSING & E. POWELL (USA) Microdistribution of interstitial meiofauna in oxygen and sulfide gradients produced by tubes of macro-infauna.
- 16:05 TARJAN, A.C. & R.L. VINTON (USA) A computer program for novice identification of marine nematodes.
- 16:30 WEHRENBURG, C. (FRG) SMB-method yields quantitative extraction of living meiofauna from marine sands.

July 19 Saturday

- 09:00 Workshops
- 11:00 Field trip to seagrass bed; lunch provided (cost \$ 5-10.00)
- 16:00 Return to USF

MEIOBENTHIC ADVICE

If ever you gained experience,  
You'll clearly hate the consequence,  
Not to know who is who  
And what they will do. -  
So don't miss the Tampa Conference!

NEWS FROM THE MEMBERS

Dr. Claus NIELSEN, Zoologisk Museum  
Universitetsparken 15,  
DK-2100 Copenhagen, Denmark

Trichoplax - where can I get it?

The peculiar primitive metazoan Trichoplax has been described by only few authors, and several features are still unknown. I should be most interested in information about where to obtain live material, so that I can perhaps get an opportunity to study its sexual reproduction and to fix material for studies on its fine structure. Please, write to the above address.

Teresa Radziejewska, Institute of Fisheries Oceanography and Protection of Sea, U. Kazimierza Królewicza 4, 71-550 Szczecin, Poland

Dear Colleagues,  
The Baltic Marine Biologists Publ. No 1 (Recommendations on Methods for Marine Biological Studies in the Baltic Sea) is now being revised and updated. I was asked to revise the benthic meiofauna section of the Recommendations. In my opinion it should be a more or less joint endeavour of meiofauna workers around the Baltic. That is why I seek your cooperation and would like to draw from your experience and expertise. Any comments you may have regarding methods and techniques for collecting and handling meiofauna samples will be most welcome. Please write to my above address. I look forward to hearing from you.

Roberto Sandulli  
Corso Vittorio Emanuele, 249  
I-83100 Avellino, Italy

I have concluded my period of study at the marine Laboratory of Aberdeen where I carried out experiments on effects of organic pollution on meiofaunal communities, and I am about to go back to my country. I take the occasion to inform you that my new address (see above) will be valid as from April '86.

HARVARD LAW

Under the most rigorously controlled conditions of pressure, temperature, volume, humidity, and other variables, the organism will do as it damn well pleases.

Reprinted from "Murphy's Law and other reasons why things go wrong" by permission of Price/Stern/Sloan Publ. Inc., Los Angeles, 1977

NEW MEMBERS

Melanie AUSTEN  
Institute for Marine Environmental Research  
Prospect Place, The Hoe,  
Plymouth PL1 3DH, U.K.

I am working on meiofauna from soft intertidal sediments in the Tamar estuary. My research includes a microcosm approach to examine the relative effects of environmental variables (such as salinity and food resource availability) and species interactions on natural meiofauna assemblages. I look forward to receiving my PSAMMONALIA over the next year.

Hans-Uwe DAHMS  
Fachbereich 7, Arbeitsgruppe Zoomorphologie  
Universität Oldenburg  
D-2900 Oldenburg, Fed. Rep. Germany

At present I am working on my Ph.D. thesis at the University of Oldenburg under the supervision of Prof. Schminke. My research is concerned with the phylogeny of marine benthic harpacticoids. Nevertheless my interests include systematics, ecology and behaviour of harpacticoid copepods. As a side aspect I try to cultivate under lab conditions some species from Antarctica which I have got recently. I would appreciate if the colleagues with similar fields of interest would put me on their mailing list.

Hieronim DASTYCH  
Krummenackerstraße 8, D-7300 Esslingen,  
Fed. Rep. Germany

For 17 years I have been working on non-marine Tardigrada, especially from mountain and polar regions. I am interested in the systematics, ecology and distribution of both the freshwater and terrestrial water-bears. Additionally, I am studying some groups of mites (Pygmephoridae, Scutacaridae). Till October 85 I was Assistant Professor at the University of Poznan, Department of Animal Morphology (Poland) and hope that I can now continue my studies in Germany.

Jukka SÄRKKÄ  
Department of Biology, University of Jyväskylä,  
SF-40100 Jyväskylä, Finland

My recent works have been on meio- and macrofauna, especially copepods and cladocerans, in profundal depths of lakes and their relation to eutrophication and organic pollution. I have also studied the occurrence of oligochaetes in

different environments, the littoral zoobenthos in lakes and the bioaccumulation of different environmental contaminants in lacustrine ecosystems.

Jyotsna SHARMA  
13227-Hunters View  
San Antonio, Tx 78230, U.S.A.

I look forward to receiving my I.A.M. newsletter now especially as I am somewhat isolated from my 'good old days' as a meiobenthologist. Last year, I finished my Ph.D. at the State University of Gent (Belgium) on the nematode fauna of three estuaries in the Netherlands. At present I am looking for employment in aquatic and/or environmental biology, but would be interested in corresponding with other biologists working on meiobenthos in North America. In particular, I would be of assistance to someone with problems in systematics of free-living nematodes.

Kenneth CORY  
San José State University,  
Washington Square,  
San José, CA 95192, U.S.A.

(so far no 'self-introduction' received)

Paul N. TURNER  
Dept. Invert. Zoology  
Natn. Mus. Nat. History  
Smithsonian Institution  
Washington, D.C. 20560, U.S.A.

(so far no 'self-introduction' received)

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Paul A. MONTAGNA  
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Lawrence Livermore National Laboratory  
University of California  
P.O. Box 5507  
Livermore, CA 94550, U.S.A.

#### ADDRESS UNKNOWN

We are looking for the actual address of  
Günther TZASCHEL

formerly at: Zoologisches Institut  
Kopernikusstr. 16  
D-5100 Aachen, Fed. Rep. Germany  
Please, inform us, so he can get his  
last issues of PSAMMONALIA.

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#### RICHARD'S COMPLEMENTARY RULES OF OWNERSHIP

1. If you keep anything long enough,  
you can throw it away.
2. If you throw anything away,  
you will need it as soon as it is  
no longer accessible.

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other reasons why things go wrong"  
by permission of Price/Stern/Sloan  
Publ. Inc., Los Angeles, 1977

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#### A BIBLIOGRAPHY OF THE INTERSTITIAL CILIATES (PROTOZOA): 1980 ff.

(PART 4)

EIKE HARTWIG, Zoological Institute and Museum; University of Hamburg, FRG

At the end of each reference, the content of the respective paper will be indicated by capital letters in parentheses. These letters stand for the following subjects: (B) Biology, morphology, fine structure; (D) Distribution, biogeography, ecology; (G) General and review; (M) Methods; (O) Original descriptions; (P) Physiology, ecophysiology; (S) Systematics, taxonomy. Part 1, Part 2 and Part 3 of this bibliography have been published in PSAMMONALIA No. 64 (May 1984), No. 65 (August 1984) and No. 67 (February 1985).

cont'd on p. 8!



- AGAMALIEV, F. G., & ALIEV, A. R., 1982. Benthic infusoria from the Divichinsky Estuary of the Caspian Sea. *Hydrobiol. J.*, 18: 20-24. (D)
- ALADRO-LUBEL, M. A. & LOPEZ-UCHOTERENA, E., 1967. Protozoarios ciliados de México. XIV. Algunos aspectos biológicos de quince colectadas en la Laguna de Mandinga, Veracruz. *Rev. Soc. Mex. Hist. Nat.*, 28: 55-71. (S).
- ALADRO-LUBEL, M. A., 1985. Algunos ciliados intersticiales de Isla de Enmedio, Veracruz, México. *Ann. Inst. Biol. Univ. Nat. Auton. México* 55, Ser. Zool. (1): 1-59. (S).
- ALIEV, A. R., 1982. On the fauna of infusoria microbenthos of Lakes Adzhikabul and Nakhalychal. *Izvest. Akad. Nauk. Azerb. SSR (Biol.)*. 1982/4: 83-88. (In Russian). (S).
- BARK, A. W., 1985. Studies on ciliated Protozoa in eutrophic lakes. 1. Seasonal distribution in relation to thermal stratification and hypolimnetic anoxia. *Hydrobiologia*, 124: 167-176. (D).
- BORROR, A. C. & WICKLOW, B. J., 1983. The suborder *Urostylina* Jankowski (Ciliophora, Hypotrichida): Morphology, systematics and identification of species. *Acta Protozool.*, 22: 97-126. (G, S).
- BOYNTON, J. E. & SMALL, E. B., 1984. Ciliates by the slice. *Science Teacher*, 51: 34-38.
- CAREY, P. G. & MAEDA, M., 1985. Horizontal distribution of psammophilic ciliates in fine sediments of the Chichester Harbour area. *J. Nat. Hist.*, 19: 555-574. (D, S).
- CAREY, P. G. & TACHELL, E. C., 1983. A revision of the genus *Epiclintes* (Ciliophora: Hypotrichida) including a redescription of *Epiclintes felis* comb. n. *Bull. Brit. Mus. Nat. Hist. (Zool.)*, 45: 41-54. (S).
- CHARDEZ, D., 1956. Quelques infusoires ciliés observés dans la région d'Ambleteuse (Pas de Calais). *Rev. Hist. Nat.*, 13: 91-92. (D).
- CZAPIK, A., 1979. *Frontonia pallida* sp. n. un nouveau cilié psammophile (Hymenostomata, Peniculina). *Acta Protozool.*, 18: 527-530. (O).
- FEBVRE-CHEVALIER, C. & FEBVRE, J., 1982. Locomotion processes in some marine pelagic and benthic protozoa. *Ann. Inst. Oceanogr. (N.S.)* 58; suppl.: 137-142. (P).
- FENCHEL, T. & FINLAY, B. J., 1983. Respiration rates in heterotrophic, free-living Protozoa. *Microbial Ecology*, 9: 99-122. (G, P).
- GULIN, M. B., POLIKARPOV, I. G., GULIN, S. B., 1983. Distribution of dominant psammophilic infusoria in the sandy sublittoral of the Black Sea. *Hydrobiol. J.*, 19: 31-36. (D).
- HARTWIG, E., 1984. Experimentelle Untersuchungen zur Wirkung von Rohöl und Rohöl/Tensid-Gemischen im Ökosystem Wattenmeer. IX. Benthische Ciliaten (Protozoa). *Senckenberg. marit.*, 16: 121-151.
- HARTWIG, E., 1986. Ciliophora. In: *Marine Fauna and Flora of Bermuda*, Sterrer, W. (ed.). Wiley, New York: 104-110. (D, S).
- HERNANDEZ-ANAYA, M., 1981. Ciliados de una laguna de los médanos cercanos al Puerto de Veracruz. Tesis Prof. Fac. Ciencias Univ. Nat. Autón. México, 81 pp. (S).
- KOVAL'CHUK, A. A., 1980. Some data on the fauna and ecology of *Metopidae* (Infusoria) in Kiew Reservoir. *Hydrobiol. J.*, 16: 38-44. (D).
- LIEPA, R. A., 1984. Typologische Charakterisierung lettischer Seen durch artliche Zusammensetzung der Infusorien. *Gidrobiol. Zh.*, 20: 13-17. (In Russian with English Summary). (D).
- LIPSCOMB, D. L. & CORLISS, J. O., 1983. *Stephanopogon*, a phylogenetically important "Ciliate" shown by ultrastructural studies to be a flagellate. *Science*, 215(4530): 303-304. (G, B, S).
- LOPEZ-UCHOTERENA, E., MADRAZO-GARIBAY, M., CHALDERON-ARAGON, L. C. & CORONADO-GUTIERREZ, R., 1976. Protozoarios ciliados de México. XXI. Algunos aspectos biológicos de doce especies recolectados en la costa del Golfo de México. *Rev. Soc. Mex. Hist. Nat.*, 37: 205-219. (S).
- MAEDA, M. & CAREY, P. G., 1984. A revision of the genera *Trachelostyla* and *Gonostomum* (Ciliophora; Hypotrichida), including redescriptions of *T. pediculiformis* (Cohn, 1866), Kahl, 1932 and *T. caudata* Kahl, 1932. *Bull. Brit. Mus. Nat. Hist. (Zool.)*, 47: 1-17. (S).
- MAEDA, M. & CAREY, P. G., 1985. An illustrated guide to the species of the family *Strombididae* (Oligotrichida, Ciliophora), free swimming Protozoa common in the aquatic environment. *Bull. Ocean Res. Inst., Univ. Tokyo*, 19: 1-68. (D, G, S).
- MAMAEVA, N. V., 1979. Composition of the flora and fauna of the Volga. Class Ciliata, Poriifera, Coelenterata. *Monographia biologicae*, 33: 408-411. (D).
- MAYEN-ESTRADA, R., 1979. Descripción y distribución de 21 especies de protozoarios ciliados bentónicos de la Laguna de la Mancha, Veracruz. Tesis Prof. Fac. Ciencias. Univ. Nat. Autón. Méx.: 62 pp. (S).
- RAIKOV, I. B. & KAVALEVA, V. G., 1982. Conservation of lamellar kinetochores of mitotic chromosomes in interphase nuclei-micronuclei of the ciliate *Trachelocerca geopetiti* Dragesco. *Tsitologiya, Leningr.* 29(10): 1153-1159. (In Russian with English Summary). (S).
- SANCHEZ-CALDERON, G., 1981. Protozoarios ciliados bentónicos de dos zonas de manglar en San Blas, Nayarit. Tesis Prof. Fac. Ciencias Univ. Nat. Autón. México: 62 pp. (S).
- SCHARF, E.-M. & SCHNESE, W., 1984. Abundance and reproduction potential of benthic ciliates in a  $\beta$ -mesosaprobic aquatorium. *Limnologica (Berl.)*, 15: 429-437. (D).
- SERAVIN, L. N. & GERASSIMOVA, 1978. A new macro-system of ciliates. *Acta Protozool.*, 17: 399-418. (G, S).
- SMITH, T. P., 1978. Distribution of benthic Ciliophora in Point Mugu Lagoon, Southern California. *Amer. Zool.*, 81: 660. (D).
- SMITH, T. P., 1982. Systematics and ecology of the benthic ciliates of Point Mugu Lagoon, Southern California. *Dissertation Abstr. int. (B)* 42: 4710. (S, D).
- WRIGHT, J. M., 1984. The ecology of psammobiotic ciliates of South Wales. *Cah. Biol. Mar.*, 25: 217-239. (D).
- ZOLOTAREVA, N. S., 1983. Infusoria from the microbenthos of Vselug Lake littoral. *Dokl. Mosk. obshch. Ispyt. Prir. (Zool. Bot.)*, 1981: 108-110. (In Russian). (D, S)

## RECENT LITERATURE

- ALBANI, A. D., FAVERO, V. & SERANDREI, B. R., 1984. Benthonic Foraminifera as indicators of intertidal environments. *Geo-Mar. Lett.*, 4: 43-47.
- ALEKPEROV, I. K., 1985. New free-living ciliates from fresh waters of Azerbaijan. *Zool. Zh.*, 64: 1461-1467. (In Russian).
- ANDRONOV, V. N., 1985. Benthic Copepoda in the area of Cape Blanc (Islamic-Republic of Mauretania). 1. The family Platycopiidae. *Zool. Zh.*, 64: 1735-1738. (In Russian).
- ANGELIER, E., ANGELIER, M. L. & LAUGA, J., 1985. Recherches sur écologies des Hydracariens (Hydrachnellae, Acari) dans les eaux courantes. *Ann. Limnol.*, 21: 25-64.
- ARMONIES, W. & HELLWIG, M., 1986. Quantitative extraction of living meiofauna from marine and brackish muddy sediments. *Mar. Ecol. Prog. Ser.*, 29: 37-43.
- BAILLARD, J. A., 1985. Simple models for surf zone sediment transport. Naval Civil Engineering Laboratory, Port Hueneme, CA 93043, U.S.A. Technical Note N71740, pp. 1-55.
- BAIRD, B. H., NIVENS, D. E. PARKER, J. H. & WHITE, D. C., 1985. The biomass, community structure, and spatial distribution of the sedimentary microbiota from a high-energy area of the deep-sea. *Deep-Sea Res. A*, 32: 1089-1101.
- BAKER, H. R., 1984. Diversity and zoogeography of marine Tubificidae (Annelida, Oligochaeta) with notes on variation in widespread species. *Hydrobiologia*, 115: 191-196.
- BARTSCH, I., 1983. Zur Halacaridenfauna der Philippinen. Beschreibung von fünf Arten der Gattung *Rhombognathus* (Acari, Halacaridae). *Entomol. Mitt. Zool. Mus. Hamburg*, 7: 396-416.
- BARTSCH, I. & ILIFFE, T. M., 1985. The halacarid fauna (Halacaridae, Acari) of Bermuda's caves. *Stygologia*, 1: 300-321.
- BATTAGLIA, B., BISOL, P. M., FAVA, G., SOYER, J. & VAROTTO, V., 1982. Variabilità genetica in copepodi bentonici nelle isole Kerguelen. *Boll. Mus. Ist. biol. Univ. Genova*, 50; suppl.: 109-112.
- BELOGUROV, O. I., 1985. The structure and main stages of evolution of endocapula as a skeletal system of the head end in nematodes. *Zool. Zh.*, 64: 359-367. (In Russian).
- BERGE, J. A., LEINAAS, H. P. & SANDØY, K., 1985. The solitary bryozoan, *Monobryozoon limicola* FRANZÉN (Ctenostomata), a comparison of mesocosm and field samples from Oslofjorden, Norway. *Sarsia*, 70: 91-95.
- BERGMANS, M., 1984. Life history adaptations to demographic regime in laboratory-cultured *Tisbe furcata* (Copepoda, Harpacticoida). *Evolution*, 38: 292-299.
- BISEROV, V. I., 1985. *Hypsibius subanomalous* sp. n. (Eutardigrada, Hypsibiidae) from the Astrakhan District. *Zool. Zh.*, 64: 131-135. (In Russian).
- BLOME, D., 1983. Ökologie der Nematoda eines Sandstrandes der Nordseeinsel Sylt. Mikrofauna Meeresboden, 88: 1-76.
- BODIN, Ph., 1984. Densité de méiofauna et peuplements des Copépodes Harpacticoides en Baie de Darnouez (Finistère). *Ann. Inst. Oceanogr.*
- BODIN, P., 1985. Quantitative distribution of meiofauna on the continental plateau of the Bay of Biscay - the Benthogas Campaign, 1973. *Cah. Biol. Mar.*, 26: 99-108.
- BONOMI, G. & ERSEUS, C., 1984. A taxonomic and faunistic survey of the marine Tubificidae and Enchytraeidae (Oligochaeta) of Italy. Introduction and preliminary results. *Hydrobiologia*, 115: 207-210.
- BOUWMAN, I. A. ROMEIJN, K., KREMER, D. R. & ES, F. B., v., 1984. Occurrence and feeding biology of some nematode species in estuarine aufwuchs communities. *Cah. Biol. Mar.*, 25: 287-303.
- BROUWER, C., 1984. Relation between salinity and distribution of nematode species from the Ems estuary. *Hydrobiol. Bull.*, 18: 67-68.
- BURTON, R. S. & SWISHER, S. G., 1984. Population structure of the intertidal copepod *Tigriopus californicus* as revealed by field manipulation of allele frequencies. *Oecologia*, 65: 108-111.
- BUTTERWORTH, P. E. & BARRET, J., 1985. Anaerobic metabolism in the free-living nematode *Panagrellus redivivus*. *Physiol. Zool.*, 58: 9-17.
- CASELLATO, S. & POJA, R., 1984. Ecology of tubificids in the lower reaches of the rivers Adige and Brenta (NE Italy). *Boll. zool.*, 51: 339-352.
- CASTEL, J., 1985. Importance des copepodes méio-benthiques lagunaires dans le régime alimentaire des formes juveniles des poissons euryhalins. *Bull. Ecol.*, 16: 169-176.
- CACCHERELLI, V. U., CORTESI, D. & FABBRI, G., 1982. Dinamica stagionale di una taxocenosi ad Arpacticoidi di ambiente Salmastro. *Boll. Mus. Ist. biol. Univ. Genova*, 50; suppl., 151-155.
- CHALUPSKY, J. & LEPS, J., 1985. The spatial pattern of Enchytraeidae (Oligochaeta). *Oecologia (Berl.)*, 68: 153-157.
- CHANDLER, G. T., 1986. High-density culture of meiobenthic harpacticoid copepods within a muddy sediment substrate. *Can. J. Fish. Aquat. Sci.*, 43: 53-59.
- CHANDRASEKHARA RAO, G. & MISRA, A., 1983. Studies on the meiofauna of Sagar Island. *Proc. Indian Acad. Sci., Anim. Sci.*, 92: 73-85.
- CHESNEY, E. J., Jr., 1985. Laboratory studies of the effect of predation on production: biomass ratio of the opportunistic polychaete *Capitella capitata* (Type I). *Mar. Biol.*, 87: 307-313.
- CHRISTENSEN, B., 1984. Asexual propagation and reproductive strategies in aquatic Oligochaeta. *Hydrobiologia*, 115: 91-95.
- COATES, K., 1984. Specific criteria in *Grania* (Oligochaeta, Enchytraeidae). *Hydrobiologia*, 115: 45-50.
- COTTARELLI, V., 1983. Osservazioni sul genere *Laophontina* e descrizione di *Laophontina paradubia* n. sp. (Crustacea, Copepoda, Harpacticoida). *Fragm. entomol.*, 17: 1-10.
- COTTARELLI, V., SAPORITO, E. P. & PUCETTI, A. C., 1983. Una nuova specie di *Psammopsyllus* di acque interstiziali di foce: *Psammopsyllus maricae* n. sp. (Crustacea, Copepoda, Harpacticoida). *Fragm. entomol.*, 17: 11-18.
- COTTARELLI, V., SAPORITO, P. E. & PUCETTI, A. C., 1986. Interstitial *Psammopsyllinae* of Sri Lanka: *Sewellina subtilis*, new species, and *Parasewell-*

- COULL, B. C., CREED, E. L., ESKIN, R. A., MONTAGNA, P. A., PALMER, M. A. & WELLS, J. B. J., 1983. Phytal meiofauna from the rocky intertidal at Murrells Inlet, South Carolina. *Trans. Amer. Micros. Soc.*, **102**: 380-389.
- DARTNALL, H. J. G. & HOLLOWAY, E. D., 1985. Antarctic rotifers. *Brit. Antarct. Surv. Sci. Repts.*, **100**: 1-46.
- DEB, M., 1984. On a small collection of freshwater Ostracoda (Crustacea) from Bihar (India). *J. Zool. Soc. India*, **36**: 35-43.
- DECHO, A. W., HUMMON, W. D. & FLEEGER, J. W., 1985. Meiofauna-sediment interactions around subtropical seagrass sediments using factor analysis. *J. mar. Res.*, **43**: 237-255.
- DECHO, A. W. & CASTENHOLZ, R. W., 1986. Spatial patterns and feeding of meiobenthic harpacticoid copepods in relation to resident microbial flora. *Hydrobiologia*, **131**: 87-96.
- DECHO, A. W. & FLEEGER, J. W., 1986. A new meiobenthic species of *Laophonte* (Copepoda: Harpacticoida) from the Florida Keys. *Trans. Amer. Micros. Soc.*, **105**: 31-37.
- DECRAEMER, W., 1984. Desmoscolecids (Nematoda) from New Georgia, Salomon Islands. *Hydrobiologia*, **119**: 181-191.
- DECRAEMER, W., 1983. Desmoscolecids from the Demerara abyssal basin off French Guiana (Nematoda, Desmoscolecida). *Bull. Mus. Natl. Hist. Nat. (France) (4E Ser.) (A. Zool. Biol. Ecol. Anim.)*, **5**: 543-560.
- DELAUNE, R. D., SMITH, C. J., PATRICK, W. H., FLEEGER, J. W. & TOLLEY, M. D., 1984. Effect of oil on salt marsh biota: Methods for restoration. *Environ. Poll. (Ser. A)*, **36**: 207-227.
- DOUGLAS, A. E., 1985. Growth and reproduction of *Convoluta roscoffensis* containing different naturally occurring algal symbionts. *J. mar. Biol. Ass. U. K.*, **65**: 881-888.
- DZWILLO, M., 1984. Phylogenetic and taxonomic problems in freshwater Oligochaeta with special emphasis on chitinous structures in Tubificinae. *Hydrobiologia*, **115**: 12-23.
- EPP, R. W. & LEWIS, W. M., 1984. Cost and speed of locomotion for rotifers. *Oecologia*, **61**: 289-292.
- ESKIN, R. A. & PALMER, M. A., 1985. Suspension of marine nematodes in a turbulent tidal creek: species patterns. *Biol. Bull. (Woods Hole)*, **169**: 615-623.
- FARRIS, R. A. & O'LEANY, D. J., 1985. Application of videomicroscopy to the study of interstitial fauna. *Int. Revue ges. Hydrobiol.*, **70**: 891-895.
- FAUBEL, A., 1984. The Polycladida, Turbellaria. Proposal and establishment of a new system. Part II. The Cotylea. *Mitt. hamb. zool. Mus. Inst.*, **81**: 189-259.
- FAUBEL, A., HARTWIG, E. & THIEL, H., 1983. On the ecology of the benthos of sublittoral sediments, Fladen Ground, North Sea. I. Meiofauna standing stock and estimation of production. *Meteor. Forschungsber.*, **D36**: 35-48.
- FLEEGER, J. W., 1983. Preliminary study on the ecology of meiobenthic Copepoda and Kinorhyncha off the Changjiang Estuary and adjacent waters. In: *Proc. Symp. Sediment Contin. Shelf Spec. Ref. East China Sea, Hangzhou. Apr. 12-16, 1983. Beijing*, 849-857.
- FLEEGER, J. W., 1985. Small benthos in estuarine food webs: comparing intertidal and subtidal habitats, pp. 127-141. In: *Proc. 4th Coastal Marsh & Estuary Symposium. (C. F. Bryan, P. J. Zwank & R. H. Chabreck, Eds.)*. Publ. Louisiana State Univ. Agricultural Center, Baton Rouge, Louisiana, U.S.A.
- FRICKE, A. H.; KOOP, K. & CLIFF, G., 1986. Modification of sediment texture and enhancement of interstitial meiofauna by an artificial reef. *Trans. Roy. Soc. Afr.*, **46**: 27-34.
- GAL'TSOVA, V. V., 1985. Role of marine nematodes in energy balance of an ecosystem. *Sov. J. Mar. Biol.*, **10**: 149-155.
- GEE, J. M., 1985. Seasonal aspects of the relationship between temperature and respiration rate in four species of intertidal harpacticoid copepods. *J. exp. mar. Biol. Ecol.*, **93**: 147-156.
- GELDER, S., 1984. Diet and histophysiology of the alimentary canal of *Lumbricillus lineatus* (Oligochaeta, Enchytraeidae). *Hydrobiologia*, **115**: 71-81.
- GIERE, O., FELBECK, H., DAWSON, R. & LIEBEZEIT, G., 1984. The gutless oligochaete *Phallodrilus leukodermatus* Giere, a tubificid of structural, ecological and physiological relevance. *Hydrobiologia*, **115**: 83-89.
- GOTHWALD, J., 1983. Interstitielle Fauna von Galapagos. XXX. Podocopida I (Ostracoda). *Mikrofauna Meeresboden*, **90**: 1-187.
- GOURBAULT, N. & VINCX, M., 1985. Abyssal nematodes (the Walda Campaign of the N/O Charcot, Jean). 5. New species of Selachinematidae, devoid of an anus. *Cah. Biol. Mar.*, **26**: 87-98.
- GRANT, I. F., EGAZ, E. A. & ALEXANDER, M., 1983. Measurements of rates of grazing of the ostracod *Cyprinotus carolinensis* on blue-green algae. *Hydrobiologia*, **106**: 199-208.
- GRIMM, R., 1985. Beiträge zur Systematik der afrikanischen Naididae (Oligochaeta). I. Beschreibung von vier neuen Arten. *Mitt. hamb. zool. Mus. Inst.*, **82**: 101-108.
- GRIMM, R., 1985. Beiträge zur Systematik der afrikanischen Naididae (Oligochaeta). II. *Dero raviensis* (Stephenson, 1914) und *Aulophorus africanus* Michaelsen, 1914 - zwei verbreitete afrikanische Arten. *Mitt. hamb. zool. Mus. Inst.*, **82**: 109-117.
- GROOT, P. DE, 1985. Crustaceans monitor marine pollution. *New. Sci.*, **106**: 22
- GUNNILL, F. C., 1984. Differing distributions of potentially competing amphipods, copepods and gastropods among specimens of the intertidal alga *Pelvetia fastigiata*. *Mar. Biol.*, **82**: 277-291.
- GUREEVA, M. A. & MAMKEV, Y. V., 1985. Morphological egg-cleavage patterns in acelous turbellarians (Acoela). 1. Variants of egg-cleavage patterns in the genus *Convoluta*. *Zool. Zh.*, **64**: 1621-1631. (In Russian).
- GUREEVA, M. A. & MAMKEV, Y. V., 1985. Morphological egg patterns in acelous turbellarians (Acoela). 2. Variants of egg-cleavage patterns in *Oxyposthia predator*. *Zool. Zh.*, **64**: 1783-1794. (In Russian).
- HARTLEY, J. P., 1984. The benthic ecology of the Forties Oilfield (North Sea). *J. exp. mar. Biol. Ecol.*, **80**: 161-195.
- HENDERSON, P. A., 1986. *Cypridopsis bamberi* sp. nov., a new species of ostracod (Crustacea: Podocopida) from England. *J. Nat. Hist.*, **20**: 1-5.

- HICKS, G. R. F., 1985. Biomass and production estimates for an estuarine meiobenthic copepod, with an instantaneous assessment of exploitation by flatfish predators. *N. Z. J. Ecol.*, **8**: 125-127.
- HICKS, F. R. F., 1986. Revised keys to *Paramphiascopsis* Lang (Copepoda, Harpacticoida, Diosaccidae) including a new species from deep water off New Zealand. *J. Nat. Hist.*, **20**: 389-397.
- HIRUTA, S., 1985. A new species of marine interstitial Tardigrada of the genus *Stygartcus* Schulz from Hokkaido, Japan. *Spec. Publ. Mukaishima Mar. Biol. Stn.*, 1985: 127-129.
- HODDA, M. & NICHOLAS, W. L., 1985. Meiofauna associated with mangroves in the Hunter River estuary and Fullerton Cove, South-eastern Australia. *Austr. J. mar. Freshwat. Res.*, **36**: 41-50.
- HOFFMAN, J. A., KATZ, J. & BERTNESS, M., 1984. Fiddler crab deposit-feeding and meiofaunal abundance in salt marsh habitats. *J. exp. mar. Biol. Ecol.*, **82**: 161-174.
- HUETTEL, R. N., 1986. Chemical communicators in nematodes. *J. Nematol.*, **18**: 37
- IMABAYASHI, H. & ENDO, T., 1985. Succession of the benthic animal community in Hiuchi-Nada of the Seto Inland Sea in relation to diminished oxygen level. *Spec. Publ. Mukaishima Mar. Biol. Stn.*, 1985: 193-198.
- ITO, T., 1986. Origin and phylogeny of the Copepoda (Crustacea). *Fac. Sci. Kyoto Univ. Pp. I-II*, 1-31. (In Japanese).
- IVANOVAKAZAS, O. M., 1985. Origin and phylogenetic significance of the trochophoran larvae. 3. Larvae of flatworms and nemerteans. *Zool. Zh.*, **64**: 1765-1776. (In Russian).
- JACOBS, L. J., 1984. The free-living inland aquatic nematodes of Africa - a review. *Hydrobiologia*, **113**: 259-291.
- JACOBI, H. & GOMES DA FONSECA, V., 1981-1982. Contribução a técnica de dissecação en Harpacticoida (Copepoda, Crustacea). *Acta biol. paran.*, **10-11**: 113-129.
- JENNESS, M. J. & DUINEVELD, G. C. A., 1985. Effects of tidal currents on chlorophyll 'A' content of sandy sediments in the southern North Sea. *Mar. Ecol. Prog. Ser.*, **21**: 283-287.
- JENSEN, P., 1985. The nematode fauna in the sulfide-rich brine seep and adjacent bottoms of the East Flower Garden, NW Gulf of Mexico. *I. Chromadorida*. *Zool. Scr.*, **14**: 247-263.
- JUMARS, P. & NEWELL, A. R. M., 1984. Fluid and sediment dynamic effects on marine benthic community structure. *Amer. Zool.*, **24**: 45-55.
- KAHAN, D. UHLIG, G. SCHWENZER, D. & HOROWITZ, L., 1982. A simple method for cultivating harpacticoid copepods and offering them to fish larvae. *Aquaculture*, **26**: 303-310.
- KARLING, T. G., 1985. Revision of Byrsophlebiidae (Turbellaria, Typhloplanoida). *Ann. Zool. Fenn.*, **22**: 105-116.
- KITAZIMA, Y., 1985. Distribution patterns of some harpacticoid copepods (Crustacea) at eleven beaches in the Inland Sea of Japan. *Spec. Publ. Mukaishima Mar. Biol. Stn.*, 1985: 151-160.
- KNEIB, R. T., 1985. Predation and disturbance by grass shrimp, *Palaemonetes pugio* Holthuis, in soft-substratum benthic invertebrates
- KOSSMAGK-STEPHAN, K.-J., 1984. A method of identifying immature specimens of marine Enchytraeidae (Oligochaeta) by vital staining of epidermal glands. *Hydrobiologia*, **115**: 55-58.
- KOSTE, W., 1985. Zur Morphologie, Anatomie, Oekologie und Taxonomie von *Paradicranophorus woeki* Koste 1961 (Aschelminthes: Rotatoria: Dicranophoridae). *Senckenb. Biol.*, **66**: 153-166.
- KUNZ, H., 1984. Beschreibung von sechs Phyllopopodopsyllus-Arten (Copepoda, Harpacticoida) vom Pazific. *Mitt. zool. Mus. Univ. Kiel*, **2**: 11-32.
- KUNZ, H., 1984. *Delamarella phyllosetosa* n. sp. (Copepoda, Harpacticoida, Familie Latiremidae Bozic) von der Küste Westafrikas. *Mitt. zool. Mus. Univ. Kiel*, **2**: 54-56.
- KUNZ, H., 1984. Räuberische Tiefsee-Harpacticoiden (Crustacea, Copepoda), eine Vermutung K. H. Beckers. *Mitt. zool. Mus. Univ. Kiel*, **2**: 49-53.
- KUNZ, H., 1984. Zur Kenntnis von fünf Phyllopopodopsyllus-Arten (Crustacea, Harpacticoida). *Mitt. zool. Mus. Univ. Kiel*, **2**: 3-10
- LAFONT, M., 1984. Oligochaete communities as biological descriptors of pollution in the fine sediments of rivers. *Hydrobiologia*, **115**: 127-129.
- LAZZARETTO, I. & LIBERTINI, A., 1985. Karyological investigations of two populations of *Tigriopus* (Copepoda, Harpacticoida) from the Kerguelen region. *J. Crust. Biol.*, **5**: 330-333.
- LEVIN, L. A., 1984. Multiple patterns of development in *Streblospio benedicti* Webster (Spionidae) from three coasts of North America. *Biol. Bull. (Woods Hole)*, **166**: 494-508.
- LIEBEZEIT, G. & VELIMIROV, B., 1984. Distribution of inorganic and organic nutrients in a sandy beach of Ischia, Bay of Naples. *Oceanis*, **10**: 437-447.
- LONSDALE, D. J. & LEVINTON, J. S., 1985. Latitudinal differentiation in embryonic duration, egg size and newborn survival in a harpacticoid copepod. *Biol. Bull. (Woods Hole)*, **168**: 419-432.
- LUXTON, M., 1986. A new species of *Fortuynia* (Acari: Cryptostigmata) from the marine littoral of Kenya. *J. Nat. Hist.*, **20**: 65-69.
- MACQUITTY, M., 1984. The marine Halacaridae (Acari) of California. *J. Nat. Hist.*, **18**: 527-554.
- MADONI, P., 1984. Estimation of the size of freshwater ciliate populations by a sub-sampling technique. *Hydrobiologia*, **111**: 201-206.
- MALAKHOV, V. V., 1983. Embryonic development of free-living marine nematodes *Hypodontolaimus inaequalis*, *Desmodora serpentulus* and *Theristus setosus*. *Nematologica*, **29**: 478-487.
- MALAN, D. E. & McLACHLAN, A., 1986. Vertical gradients of meiofauna and bacteria in subtidal sandy sediments from two high-energy surf zones in Algoa Bay, South Africa. *S. Afr. J. Mar. Sci.*, **10**: 43-54.
- MARTENS, P. M., 1984. Three new *Duplominona* species (Turbellaria, Monocelididae, Minoninae) from the Mediterranean. *Cah. Biol. Mar.*, **25**: 319-331.
- MARTENS, K. & TOGUEBAYE, B., 1985. On the presence of *Cypris subglosa* Sowerby, 1840 (Crustacea, Ostracoda) in Africa, with notes of the distribution of this species. *Annls. Soc. Roy. Zool. Belgique*, **115**: 147-154.
- MASALLES, D., 1985. Dos nuevos Draconematidae (Nematoda) para el Mediterraneo Español: *Draconema claparedii* (Metschnikoff, 1867) Filipjev, 1918. v *Prochaetosoma vitielloi* Allen & Noff-

- MAYER, L. M., RAHAIM, P. T., GUERIN, W., MACKO, S. WALTER, L. & ANDERSON, F. E., 1985. Biological and granulometric controls on sedimentary organic matter of an intertidal mudflat. Est. Cstl. Shelf Sci., 20: 491-503.
- McLACHLAN, A., 1985. The ecology of two sandy beaches near Walvis Bay. Madoqua, 14: 155-163.
- MEAD, A. P. & KOLASA, J., 1984. New records of freshwater Microturbellaria from Nigeria, West Africa. Zool. Anz., 212: 257-271.
- MORTON, D. W., 1985. Revision of the Australian Cyclopidae (Copepoda, Cyclopoida). 1. Acanthocyclops Kiefer, Diacyclops Kiefer and Australocyclops, gen. nov. Aust. J. Mar. Freshwat. Res., 36: 615-634.
- MURALIKRISHNAMURTY, P. V., 1983. Intertidal phyta fauna off Gangavaram, east coast of India. Indian J. mar. Sci., 12: 85-89.
- NICHOLAS, W. & STEWART, A. C., 1984. Oncholaimus balli n. sp. (Nematoda: Oncholaimidae) from a volcanic crater lake in Papua New Guinea, with observations on the colonisation of the lake by nematodes. Nematologica, 30: 1-10.
- NIGRAM, R., 1986. Foraminiferal assemblages and their use as indicators of sediment movement: a study in the shelf region off Navapur, India. Cont. Shelf. Res., 5: 421-430.
- NORDHEIM, H. v., 1984. Life histories of subtidal interstitial polychaetes of the families Polygordiidae, Protodrilidae, Nerillidae, Dinophilidae, and Diurodrilidae from Helgoland (North Sea). Helgoländer Meeresunters., 38: 1-20.
- NOTENBOOM, J., 1984. Arubolana parvioculata n. sp. (Isopoda, Cirolanidae) from the interstitial of an intermittent river in Jamaica, with notes on A. inula Botosaneanu et Stock and A. aruboides (Bowman and Iliffe). Bijdr. dierk., 54: 51-65.
- NUNOMURA, N., 1985. Marine isopod crustaceans in the coast of Toyama Bay. Mem. Natn. Sci. Mus., Tokyo, 18: 121-139.
- NUNOMURA, N., 1985. Marine tanaid and isopod crustaceans off Kagawa Prefecture, Seto Inland Sea, Japan. Spec. Publ. Mukaishima Mar. Biol. Stn., 1985: 101-112.
- OHTAKA, A., 1985. Taxonomical studies of the Japanese Naididae (Annelida, Oligochaeta). 1. Four unrecorded species in small genera. J. Fac. Sci. Hokkaido Univ. Ser. 6, Zool., 24: 113-121.
- OKUBO, I., 1985. A new species of the genus Xestoleberis from Japan. Spec. Publ. Mukaishima Mar. Biol. Stn., 1985: 123-126.
- ONBÉ, T. & KIMOTO, Y., 1985. Growth and reproduction of Longipedia sp. (Copepoda: Harpacticoida) in laboratory cultures. Spec. Publ. Mukaishima Mar. Biol. Stn., 1985: 205-212.
- PESCE, G. L., 1984. Nitocrella morettii n. sp. from phreatic waters of central Italy, and up-to-date key to the species of Nitocrella sensu Petkovski (Crustacea, Harpacticoida, Ameiridae). Bull. zool. Mus. Univ. Amsterdam, 10: 21-24.
- PESCE, G. L., 1985. Amsterdam expeditions to the West Indian Islands, Report 45. Cyclopoids (Crustacea, Copepoda) from West Indian groundwater habitats. Bijdr. dierk., 55: 295-323.
- PESCE, G. L., 1985. A new harpacticoid from phreatic waters of Lesbos, Greece, and notes on the "Rassenkreise" of Elaphoidella elaphoides (Chappuis) (Copepoda: Ameiridae). Rev. Suisse Zool., 92: 605-612.
- PHILLIPS, N. W., 1984. Role of different microbes and substrates as potential suppliers of specific, essential nutrients to marine detritivores. Bull. mar. Sci., 35: 283-298.
- PHILLIPS, F. E. & FLEEGER, J. W., 1986. Meiofauna meso-scale variability in two estuarine habitats. Est. Cstl. Shelf Sci., 21: 745-756.
- PLATT, H. M., 1985. Further observations on the Ethmolaimidae (Nematoda: Chromadorida). J. natur. Hist., 19: 139-149.
- PLATT, H. M. & LAMBSHEAD, P. J. D., 1985. Neutral model analysis of patterns of marine benthic species diversity. Mar. Ecol., 24: 75-81.
- PLATANOVA, T. A., 1985. Taxonomy of some close-related species of the genus Pseudocella Filipjev, 1927 (Nematoda, Enoplida). Zool. Zh., 64: 1794-1801. (In Russian).
- POIZAT, C., 1985. Interstitial opisthobranch gastropods as indicator organisms in sublittoral sandy habitats. Stygologia, 1: 26-42.
- POR, F. D., 1986. New deep-sea Harpacticoida (Copepoda) of cletodid type, collected in the Indian Ocean by R/V "Anton Bruun" in 1964. Crustaceana, 50: 7899.
- PUGH, P. J. A. & KING, P. E., 1985. Feeding in intertidal Acari. J. exp. mar. Biol. Ecol., 94: 269-280.
- PUGH, P. J. A. & KING, P. E., 1985. The vertical distribution of the British intertidal Acari - the non halacarid fauna (Arachnida: Acari). J. Zool. Lond. (A), 207: 21-33.
- RAMAZZOTTI, G. & MAUCCI, W., 1983. Il phylum Tardigrada. Memorie Ist. ital. Idrobiol., 41: 1012 pp.
- READ, G. B., 1986. New deep-sea Poecilochaetidae (Polychaeta: Spionidae) from New Zealand. J. Nat. Hist., 20: 399-413.
- REDDY, R. Y., 1984. The undescribed female of Pseudostenhelia secunda Wells, 1971. (Copepoda, Harpacticoida) and keys to the genus. Hydrobiologia, 114: 149-156.
- REIDENAUER, J. A. & THISTLE, D., 1985. The tanaid fauna from a region of the deep North Atlantic where near-bottom current velocities are high. Oceanol. Acta, 8: 355-360.
- REISE, K., 1984. Indirect effects of sewage on a sandy tidal flat in the Wadden Sea. Neth. Inst. Sea Res. Publ. Ser., 10: 159-164.
- REISE, K., 1985. Tidal flat ecology. An experimental approach to species interactions. (Ecological Studies, Vol. 54). Springer, Berlin, 191 pages.
- RENAUD-MORNANT, J., 1984 (1985). Nouveaux Arthrotardigrades des Antilles. Bull. Mus. nat. Hist. natur., A6: 975-988.
- RIEGER, M., 1985. Some lower food web organisms in the nutrition of marine harpacticoid copepods: an experimental study. Helgoländer Meeresunters., 39: 357-366.
- RIVAIN, V., 1984. Etude expérimentale de l'action d'un prédateur endogé sur le méiobenthos temporaire. Oceanis, 10: 259-277.

- ROSHCHIN, A. M. & CHEPURNOV, V. A., 1985. Some features of feeding and development of 2 benthic harpacticoid species in benthic diatom cultures. *Zool. Zh.*, 64: 1648-1654. (In Russian).
- SALVINI-PLAWEN, L. v., 1985. New interstitial Solenogastres (Mollusca). *Stygologia*, 1: 101-108.
- SANDERS, H. L., HESSLER, R. R. & GARNER, S. P., 1985. *Hirsutia bathyalis*, a new unusual deep-sea benthic peracaridan crustacean from the tropical Atlantic. *J. Crust. Biol.*, 5: 30-57.
- SCHOCKAERT, E. R. & MARTENS, P. M., 1985. Turbellaria from Somalia. III. *Lecithoepitheliata* and *Typhloplanoida*. *Monit. zool. Ital.*, 20, suppl.: 27-41.
- SCHRIEVER, G., 1983. New Harpacticoida (Crustacea, Copepoda) from the North Atlantic Ocean. III. New species of the family Cletodidae. *Meteor. Forschungsgeb.*, D36: 65-83.
- SCHWANK, P., 1985. Differentiation of the coenoses of Helminthes and Annelida in exposed lotic microhabitats in mountain streams. *Arch. Hydrobiol.*, 103: 535-543.
- SCHWOERBEL, J., 1986. Rheophile Wassermilben (Acari) aus Chile. I. Hyporheische Arten. *Arch. Hydrobiol.*, 106: 71-78.
- SMALL, E. B. & GROSS, M. F., 1985. Preliminary observations of protistan organisms, especially ciliates, from the  $21^{\circ}\text{N}$  hydrothermal vent site. *Bull. Biol. Soc. Wash.*, 6: 401-410.
- SMITH, C. J., DELAUNE, R. D., PATRICK, W. H. & FLEEGER, J. W., 1984. Impact of dispersed and undispersed oil entering a Gulf Coast salt marsh. *Environ. Toxicol. Chem.*, 3: 609-616.
- SMITH, J. P. III. & TYLER, S., 1984. Serial sectioning of resin-embedded material for light microscopy: Recommended techniques for micro-metazoans. *Mikroskopie*, 41: 259-270.
- SOPOTT-EHLERS, B., 1986. Die Feinstruktur der Sekkolben und der Lamellarkörper von *Parotopiana capitata* (Plathelminthes, Proseriata).
- STOCK, J. H., 1985. Discovery of interstitial Isopoda of the family Microparasellidae in inland waters of Australia. *Stygologia*, 1: 93-100.
- TAMMINEN, T. & KUPARINEN, J., 1984. On the measurement of heterotrophic activity in the aquatic environment using labelled substrates.
- TIMOSHKIN, O. A., 1986. Peculiarities of the structure and taxonomic position of the Prolecithophora from Baikal Lake (Turbellaria). *Zool. Zh.*, 65: 16-27. (In Russian).
- TINSON, S. & LAYBORN-PARRY, J., 1986. The distribution and abundance of benthic cyclopoid copepods in Esthwaite Water, Cumbria. *Hydrobiologia*, 131: 225-234.
- TSCHESUNOV, A. V. & KRASNOVA, E. D., 1985. The morphology, variability and synonymy of a free-living nematode *Chromadoropsis vivipara* (Chromadoria, Desmodorida, Spiriniidae) from the White Sea. *Zool. Zh.*, 64: 347-358. (In Russian).
- TUFFRAU, M., 1985. A new species of the genus *Euplotidium* Noland 1937 - *Euplotidium prosaltans* n. sp. (Ciliata, Hypotricha). *Cah. Biol. Mar.*, 26: 53-62.
- TZSCHASCHEL, G., 1983. Seasonal abundance of psammon rotifers. *Hydrobiologia*, 104: 275-278.
- VALBONESI, A. & LUPORINI, P., 1984. Researches on the coast of Somalia. Gastrotricha, Macrotrichida. *Monit. zool. Ital.*, 19, suppl.: 1-34.
- VARSHNEY, P. K., 1985. Meiobenthic study off Mahim (Bombay) in relation to prevailing organic pollution. *Mahasagar*, 18: 27-37.
- VENKATSWAMY REDDY, H. R. & HARIHARAN, V., 1985. Meiofauna of Natravathi-Gurpur Estuary (Mangalore), west coast of India. *Indian J. Mar. Sci.*, 14: 163-164.
- VIETS, K. O., 1984. Über Wassermilben (Acari, Hydrachnellae) aus Australien. *Arch. Hydrobiol.*, 101: 413-436.
- VILELA, M. H., 1984. Production experiments of the marine harpacticoid copepod *Tigriopus brevicornis* Muller, reared on various feeding regimes. *Boll. Inst. Nac. Invest. Pesca*, 11: 83-115.
- VOLOKONITIN, A. F., 1985. The distribution of psammophilous infusorians on a sand flat of Popov Island (Sea of Japan). *Biologiya Morya (Vladivostok)*, 5: 13-17. (In Russian).
- VOROB'EVA, L. V., 1985. Distribution of copepods (Harpacticoida) on the sandy beaches of the Odessan Coast. *Sov. J. Mar. Biol.*, 10: 155-159.
- VRANOVSKY, M., 1984. Die Rheoseton-Mesofauna des Flusses Bela. In: *Limnologie des Flusses Bela*. - *Limnologia Riecky Bela*. Ertl, M. (ed.), Laboratorium Rybarstva a Hydrobiologie, Bratislava (Czechoslovakia). Publ. by: Laboratorium Rybarstva a Hydrobiologie, Bratislava (Czechoslovakia), pp. 231-272. *Pr. Lab. Ryb. Hydrobiol.*, Bratisl., vol. 4.
- VRIES, E. J., 1984. On the taxonomic status of *Planaria torva* from Corsica (Turbellaria, Tricladida, Paludicola). *Mitt. Zool. Mus. Berl.*, 60: 17-21.
- WESTHEIDE, W., 1986. The nephridia of the interstitial polychaete *Hesionides arenaria* and their phylogenetic significance (Polychaeta, Hesionidae). *Zoomorphology*, 106: 35-43.
- WOODIN, S. A., 1985. Effects of defecation by arenicolid polychaete adults on spionid juveniles in field experiments: selective settlement or differential mortality. *J. exp. mar. Biol. Ecol.*, 87: 119-133.
- YINGST, J. Y. & RHOADS, D. C., 1985. The structure of soft-bottom benthic communities in the vicinity of the Texas Flower Garden Banks, Gulf of Mexico. *Estuar. coastl. Shelf Sci.*, 20: 569-592.

#### CLARKE'S LAW OF REVOLUTIONARY IDEAS

Every revolutionary idea - in science, politics, art or whatever - evokes three stages of reaction. They may be summed up by the three phrases:

1. "It is impossible - don't waste my time."
2. "It is possible, but it is not worth doing."
3. "I said it was a good idea all along."

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LAST MINUTE ADDITIONS

BARTSCH, I., 1986. Zur Gattung Agauopsis (Acari, Halacaridae). Beschreibung zweier neuer Arten und Übersicht über Verwandtschaftsgruppen. Zool. Scr., 15: 165-174.

DECRAEMER, W. & GOURBAULT, N., 1986. Marine nematodes from Guadeloupe and other Caribbean Islands. II. Draconematidae. Zool. Scr., 15, 107-118.

FELLER, R.J., ZAGURSKY, G. & DAY, E.A., 1985. Deep-sea food web analysis using cross-reacting antisera. Deep-sea Res., 32, 485 -

GIERE, O., ERSEUS, C. & LASSERRE, P., 1986. Class Oligochaeta. In: Marine Fauna and Flora of Bermuda. Sterrer, W. (ed.). Wiley, New York: 258-264.

JENSEN, P., 1986. The nematode fauna in the sulphide-rich brine seep and adjacent bottoms of the East Flower Garden, NW Gulf of Mexico. II. Monhysterida. Zool. Scr., 15, 1-11.

JENSEN, P., 1986. The nematode fauna in the sulphide-rich brine seep and adjacent bottoms of the East Flower Garden, NW Gulf of Mexico. III. Enoplida. Zool. Scr., 15, 93-100.

LORENZEN, S., 1986. Odontobius (Nematoda, Monhysteridae) from the baleen plates of whales and its relationship to Gammarinema living on crustaceans. Zool. Scr., 15, 101-106.

RIEMANN, F., 1986. Nicascolaimus punctatus gen. et sp.n. (Nematoda, Axonolaimoidea), with notes on sperm dimorphism in free-living marine nematodes. Zool. Scr., 15, 119-124.

!!! We all go to Mexico!

(... and to Tampa!)



The I. A. M.-Team for the Mundial in Mexico!

REFLECTIONS ON CHERNOBYL, HARRISBURG, CAPE CANAVERAL etc.

or

GILB'S LAWS OF UNRELIABILITY

1. Computers are unreliable, but humans are even more unreliable.
2. Any system which depends on human reliability is unreliable.
3. Undetectable errors are infinite in variety, in contrast to detectable errors which, by definition, are limited.
4. Investment in reliability will increase until it exceeds the probable cost of errors, or until someone insists on getting some useful work done.

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