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MONOCULUS

Copepod Newsletter

Nr. 9

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Copepod Newsletter

Number 9 July 1984

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This issue has been typed by: Angelika Sievers, Fachbereich 7 (Biologie), Universität Oldenburg.

It is my regret to inform you the Japanese oldest copepodologist, Mr. Tadao Sato, passed away on April 1 at the age of 96 years.
He published when he was young, a paper entitled "Pelagic Copepoda" No. 1 in Rep. Hokkaido Fish. Exp. Sta. Vol. 1, 1913, describing 30 species of Calanoida including 5 new species. He has not continued copepod work. He managed oyster farm in Matoya Bay, Mie Pref. and at the same time he established a small private laboratory, Matoya Bay Oyster Research Laboratory, where he worked until his death.

S. Motoda, Tokyo, Japan

Deadline for the next issue of *MONOCULUS*: 15 February 1985

Editorial

It is a pity that not all of you can come to Ottawa and take part in the Second International Conference on Copepoda. Chang-tai Shih counted close to 100 paid delegates on the 27th of June, the day before he sent us his last letter. We presume that all of you would have liked to participate, wouldn't you? In order to make you forget your disappointment, here is No. 9 of *MONOCULUS* instead, even though, honestly, it can't be a full compensation for the marvellous programme at Ottawa.

We have received lots of contributions already. Most of them fall under the heading of "current research activities", the neglected child of the last few issues. This boom we owe to the latest questionnaire. 51 of them have already been returned! But don't get the impression this might already be enough. We are still expecting many more. Please tear out the yellow page in *MONOCULUS* No. 8 and return it packed with information as soon as possible.

The other contributions are to a variety of topics. We thank B. Dussart, F. Ferrari, A. Humes, S. Motoda, V. Øresland, K. Preslock, L.S. Roberts, and K. Rohde for their cooperation. Special thanks are due to S. Motoda for an impressive donation. He enclosed US $ 50.00 with his letter for printing and mailing costs of *MONOCULUS*!! This is a great help which is gratefully acknowledged.

There is another reason for the early appearance of this year's second issue of *MONOCULUS*. Kurt is starting on his sabbatical directly after the Conference in Ottawa and won't be back before early next year. This gives us the rare opportunity to wish you all the best for New Year a little in advance, but you will certainly remember when the appropriate time has come.

F. K. Schram J. Schram

Business ssenisuB

1. Bibliography

Our work at the computer continues. Hans Dahms is working hard to help produce a first computer list for the Conference at Ottawa. Jürgen Sieg, of course, is also heavily involved and even Gerd is having his share in these preparations. Meanwhile new lists of publications keep coming in so that a few more colleagues are entitled to an asterisk before their name: Bayly, Hulsemann, Kerambrun, Martens, Piontkovskii.

2. *MONOCULUS*-Library

It was not to be expected that the reprints received within two months would add up to the usual long list of current literature. We therefore expect it to be double the size next time. Please don't forget the *MONOCULUS*-Library on your mailing list.

3. *MONOCULUS*-Museum

No news, except that N. Rayner from Pietermaritzburg announced that she would send material or bring it along to Ottawa.

4. *MONOCULUS*-Glossary

B. Dussart from Les Eyzies, France, contributes the following remark: *Pour ma part, j'utilise céphalosome pour la tête seule, cephalothorax pour le céphalosome + 1er segment thoracique (quand la première paire de pattes est portée par ce segment "céphalique"), thorax et abdomen; A1 = antennule; A2 = antenne; Mx1 = Maxillule; Mx2 = maxille. P1 à P5 = pattes thoraciques ou tout simplement pattes. Problème avec P6 qui, en fait est un pléopode et non plus un pereiopode! C'est le vestige des pattes du premier segment abdominal.*
D'accord pour le "complexe génital" qui, chez la femelle est constitué de deux segments soudés. Pour "caudal ramus", la traduction française peut être réduite à furca puisqu'on ne connait guère de furca non caudale!

5. Current research activities

K.-G. BARTHEL from Kiel, W. Germany:
Feeding biology of copepods in the Arctic Ocean in relation to the oceanographic regimes.

I.A.E. BAYLY from Clayton, Australia:
The last two years were devoted to an intensive study of the zooplankton of a meromictic, Antarctic lagoon with seasonal sea water exchange. This paper makes special reference to the calanoid copepod Drepanopus bispinosus Bayly 1982, and will be published in 1985. Additionally, I am working towards a comprehensive revision of the South American species of Boeckella and Pseudoboeckella (Calanoida). I started the latter project in 1977 and hope to have it completed within the next two years.

W. BECKMANN from Hamburg, W. Germany:
Seasonal and geographic variations in the zooplankton distribution in the Red Sea, especially calanoid copepods.

R.S. BENDA from Ketchikan, U.S.A.:
Argulid and other external parasites of salmonids. Planktonic food selectivity of Sockeye salmon.

G. BOXSHALL from London, England:
I am extending my skeletomusculature studies to include a variety of different Siphonostomatoid species. My basic siphonostome is a large deep-sea form, Hyalopontius (Megapontiidae) and I am comparing it in detail with Lepeophtheirus, a caligid fish parasite. A number of other species have been examined including Pontoeciella, Entomolepis and Nicorhiza from invertebrate hosts and Lernaeocera from fishes. This project links in with a larger revision of the families of siphonostomes parasitic on invertebrates which my colleague, Sheila Halsey, and I have been working on for some time.

J. BRADFORD from Wellington, New Zealand:
Studies of the distribution and role of zooplankton (especially copepods) play in N.Z. coastal waters. Particular attention is

being paid at the moment to an upwelling plume system in western Cook Strait.

P.H. BURKILL from Plymouth, England:
My current research involves the estimation of the quantitative importance of copepods and other grazing zooplankton in the cycling of nitrogen in seawater. This principally involves the determination of biomass and nitrogen excretion rates of different size classes of zooplankton by shipboard observation and experimentation. Geographically, this work has been carried out in estuarine waters (Bristol Channel), continental shelf-waters (Celtic Sea) and shelfbreakwaters (Celtic Sea/Atlantic margins). In 1985, this work, which is part of a multi-disciplinary study of marine nitrogen cycling, will be extended to the Arabian Sea.

G. CITARELLA from Cotonou, Benin:
Distribution des Copépodes dans le détroit de Northumberland (S.W. golfe du Saint-Laurent).

C.J. CORKETT from Halifax, Canada:
The laboratory rearing of Calanus finmarchicus, C. glacialis, C. hyperboreus, Pseudocalanus minutus, Pseudocalanus species A, Pseudocalanus species B, at different temperatures and a comparison of these development rates with life cycles from Nova Scotia. Estimation of copepod production on the Scotian Shelf, Nova Scotia.

D.M. DAMKAER from Seattle, U.S.A:
History of the study of Copepoda; preparing Biography of M.S. Wilson.

G. DEETS from Long Beach, U.S.A.:
I have made a tremendous collection of elasmobranchs (sharks and rays) for the last 3 years off southern California and the southern Sea of Cortez. I have also acquired a collection of ray parasites from Madagascar, compliments of Dr. Roger Cressey at the Smithsonian, and I recently returned from the California Academy of Sciences in San Francisco in which I scavenged through their ichthyology dept. retrieving many new parasitic

copepods from elasmobranchs from all over the world. The future finds me scheduled to start my Doctoral program under the well known phylogeneticist and evolutionary biologist Dr. Dan Brooks. There I will continue to work on Parasitic copepod/Elasmobranch coevolution, parallel cladogenesis, vicariance biogeography and the like, with a possible Pacific research expedition in the making. Currently, I am under the guidance of the amazing Dr. Ju-Shey Ho and my work is going slow but very good.

B. DUSSART from Les Eyzies, France:
En préparation:
- Le genre Mesocyclops dans le monde
- Les copépodes de Sri Lanka
- Les copépodes de Polynésie française et leur rôle.

F. EVANS from Cullercoats, England:
With the help of no less than five graduate assistants (paid for for one year by a Government scheme for the unemployed) I am analysing a monthly series of plankton samples taken by me five miles off the north east coast of England from 1969 to the present. Each month in 55°07'N, 01°20'W at a depth of 54 m vertical plankton tows from bottom to surface have been taken, using three nets, of aperture 1 mm, 0.20 mm and 0.064 mm (coarse, medium and fine). The sorting, subsampling, identifying and counting, mostly of copepods, will be completed in August 1984. The results are held on computer file.

G. FAVA from Venice, Italy:
- Genetics of quantitative characters in natural and experimental populations of Tisbe.
- Evolutionary genetics in Tisbe clodiensis.
- Morphometrical comparisons in lagoon and marine populations of Tisbe.

C.-H. FERNANDO from Waterloo, Canada:
- Freshwater Cyclopoida and Calanoida of Malaysia (with Dr. R. Lim, Malaysia)
- Sri Lankan freshwater Copepoda (with Dr. B.H. Dussart, France)
- Latitudinal distribution of freshwater Copepoda with special reference to tropical and sub-tropical area

- Central American freshwater Copepoda (with C. Collado).

F. FERRARI from Washington, U.S.A.:
Ruth Bottger of Hamburg and I are describing both sexes of what appears to be a new species of Paroithona; to date males of this genus have not been described. The completion of this work along with recent work with Jim Orsi on Limnoithona and earlier descriptions of other oithonids should allow a clear assessment of the extent of sexual dimorphism among the four lineages of the family.
I am also working with John Dearborn and Kelly Edwards at Orono, Maine, on the feeding biology of an interesting antarctic brittlestar, Astrotoma agassizii. I am identifying pelagic calanoids - primarily Euchaeta antarctica, Calanoides acutus, and Drepanopus forcipatus - from stomach contents. John, Kelly, and I have asked - can pelagic aggregations cause benthic satiation. We will answer yes.
Finally, I recently finished a study of the distribution of sex and asymmetry in Pleuromamma xiphias collected over one week in 1969 by Howard Roe in England. I am casting about for ways of studying these creatures on a seasonal basis. Can *MONOCULUS* readers suggest how or where I might obtain a series of samples collected monthly, bimonthly or quarterly in the upper 1000 m from a tropical or subtropical oceanic locality?

J. FLEEGER from Baton Rouge, U.S.A.:
I am interested in the value of mucus production by copepods especially in regards to a tube-building meiobenthic copepod recently discovered in my laboratory. A paper is in press describing this unusual behaviour for copepods.

A. FOSSHAGEN from Blomsterdalen, Norway:
Taxonomic studies of benthic calanoids from deep water in the Norwegian Sea and from marine caves in the Bermuda Islands. Studies of the near bottom fauna from the Norwegian Sea with an epibenthic sledge has revealed a rich fauna of calanoids with several new and interesting species.
A preliminary survey of Bermuda caves until now has shown that there are 16 species of cave dwelling calanoid copepods. Of

these 3 species are known earlier from Bermuda, 10-12 species are new, among them representatives from 3 new genera.

G. FRYER from Ambleside, England:
Apart from some work concerned with ecology and distribution relatively little copepod work is in hand.

H. HATTORI from Sendai, Japan:
Spatial and temporal distribution of copepods in the western North Pacific Ocean.

G. HEWITT from Wellington, New Zealand:
Karyotypology and electrophoretic protein variation in Copepoda parasitic on fish.

R. HIPEAU-JACQUOTTE from Marseille, France:
Biology of the ascidicolous copepod Pachypygus gibber (Notodelphyidae), a species with dimorphic males.
- Study of the population dynamics (S. Heussner's these)
- Ultrastructural study of a sense organ present in only one of the two males (paper in preparation)
- Comparative ultrastructural study of the spermatogenesis and spermatozoa in the two males (paper in preparation in collaboration with F. Cóste)
- Study of environmental conditions, particularly the age of the host (in natural and laboratory conditions), which influence the sexual differentiation of the copepod.

At the moment, I focus a biological test to know the nature of the external factors which play a role in the parasite's differentiation.

T. ITO from Shirahama, Japan:
Studies on larval development of some copepods, a cephalocaridan, and a certain primitive maxillopodan for the base of a study of the phylogeny and evolution of Copepoda.

J.B. JONES from Wellington, New Zealand:
Preparing M/S of a revision of the genus Hatschekia for publication.
Describing a new parasitic copepod from a deep water gastropod.
I wish to begin a review of Sphyrion in New Zealand waters. I

have a "hunch" that there is a new "deep water" species lurking here.

P. KERAMBRUN from Marseille, France:
Effets physiologiques et biochimiques de stress;
Effets du régime alimentaire sur la physiologie digestive et la réproduction chez Tisbe holothuriae.

W.C.M. KLEIN BRETELER from Texel, Netherlands:
Growth and development of quantitatively important copepods of the North Sea, cultivation of these species, and studies on grazing using cultured flagellates and an electronic particle counter.
Presently I am concentrating on Temora longicornis and Pseudocalanus sp.

H. KUNZ fro ı Bischmisheim, W. Germany:
Taxonomy and systematics of marine harpacticoids. At present work on Cylindropsyllidae from Hawaii and S.W. Africa.

J.A. LINDLEY from Plymouth, England:
- Overwintering of calanoid copepods
  Research into comparative overwintering strategies of common calanoid copepods including the rôle of oil sacs, diapause, resting eggs and responses to photoperiod, temperature and food shortage. Paper in preparation, further cruise planned for December 1984.
- Comparative biology of Pseudocalanus and Acartia
  Preparation for experimental work on comparative biology of P. elgonatus and A. clausi in conditions found in the open seas around the British Isles.

M. MADHUPRATAP from Donapaula, India:
I am finishing a manuscript on the epipelagic copepods of northern Indian Ocean - their structure, zoogeography and distribution.

P. MARTENS from List/Sylt, W. Germany:
The field of research of the Department of Biological Oceanography of the BAH in List is split up into two main subjects.

A.) Measurements on the respiration of natural zooplankton communities. Natural zooplankton communities (caught by nets) are enclosed in glas-bottles and the oxygen consumption is measured by polarographic oxygen sensors. The respiration is a measure of the metabolic activity of the zooplankton. For more details see my next paper which is in press (I will send it to Kurt). This method was used on several cruises to the Fladen Ground. It has to be adapted to the conditions in the wadden sea area where I normally work, then it will become a standard procedure for the next years.
B.) Two times a week measurements are made on the amount and species composition of phytoplankton and zooplankton in the northern Wadden Sea of Sylt (German Bight). In addition several environmental conditions are measured as temperature, salinity, oxygen content, phytoplankton nutrients, seston dry weight, chlorophyll-a and so on. Statistical procedures give us an idea of the relationships between the different parameters.

J.B.L. MATTHEWS from Oban, England:
Investigations on biological exchange processes between fjords and coastal water (west coast of Norway). Plankton samples are taken in the upper layers of the Korsfjord and in various water masses offshore as frequently as possible over a period of several years. Using information on current speeds and direction an attempt will be made to estimate net (residual) transport of plankton. The project is in its final year.

A.D. McKINNON from Melbourne, Australia:
- Distributional studies of planktonic copepods in Port Philip and Westernport Bays, Victoria, and Shark Bay, Western Australia
- Taxonomic description of new species of the genera Paramisophria, Centropages, Labidocera (Calanoida) and Doropygus (Cyclopoida)
- Measurement of growth rates of Acartia in Westernport Bay, using a new in situ incubation technique
- Comparison of life history strategies of Acartia and Paracalanus.

T.S. MINELLO from Galveston, U.S.A.:
Although I only have two publications that would perhaps be of interest to copepodologists (copies enclosed), I am still very interested in working in this area. Presently, with the National Marine Fisheries Service, I am working on predator-prey interactions concerning Penaeid shrimp. I hope to publish part of my dissertation research this year on the ecology of coastal zooplankton in the Gulf of Mexico. I am presently working with a graduate student at Texas A M University on substrate selection by the demersal copepod, Pseudodiaptomus coronatus.

C. MONNIOT from Paris, France:
My first interest is the tunicates. My work on the Copepoda is irregular. I have 3 publications in press on Copepoda. I have in project some works on deep sea parasite Copepoda and on West Indies ascidicolous copepods.

T. ONBE from Hiroshima, Japan:
- Growth and reproduction of the harpacticoid copepod Longipedia sp.
- The developmental stages of Longipedia sp. (Copepoda: Harpacticoida).
- The vertical microdistribution of copepods in the central part of the Inland Sea of Japan.
- The vertical microdistribution of copepods in the Ohta River estuary, Hiroshima.

Y. RANGA REDDY from Nagarjunanagar, India:
A review of the genus Allodiaptomus Kiefer is being prepared. A Ph.D. thesis consisting, inter alia, of the postembryonic developmental instars of eight diaptomid species is on the anvil.

N.A. RAYNER from Pietermaritzburg, South Africa:
Registered for Ph.D. May, 1984
Subject: 'Biology of southern African freshwater Copepoda, with particular reference to semi-arid environments.'
Plenty of material to work on! but have not begun in earnest yet. Still completing papers to be sent for publication relating to M.Sc. thesis.

M. RIEPER from Helgoland, W. Germany:
After establishing that marine harpacticoid copepods can grow and reproduce on a sole diet of bacteria, and that certain species are capable of selective feeding (on bacteria), I have begun feeding experiments using ciliates and plankton algae as food for the harpacticoid copepods Tisbe holothuriae and Paramphiascella vararensis.
Although I cannot personally attend the International Conference on Copepoda in Ottawa this year, I have submitted a manuscript to Dr. Corkett entitled "Simple methods for culturing marine harpacticoid copepods in the laboratory", for inclusion in his discussions on the cultivation of copepods.

G. SCHRIEVER from Kiel, W. Germany:
Continuing the investigation on Deep Sea Harpacticoida from the Iceland-Faroe Ridge. Taxonomic and ecological analysis of the material, collected by Dr. Hj. Thiel, University of Hamburg, in 1966. Additional material from the same area and cruise is now also presented from Prof. Noodt for additional investigation.

E. SOLER TORRES from Valencia, Spain:
I'm making the "tesina", a little or minor thesis, about "Copepods and Cladocerans from the Cullera Bay (Valencia, east of Spain). Annual cycle".
I'm studying the systematics and ecology of both groups. So, I can find relationships between physical factors, phytoplankton, nutrients, microbiology and perhaps organic contamination and the Copepods and Cladocerans. I'm very interested in the sytematics of Copepods, and I've material for one or two publications about Harpacticoida and Acartidae. All the work is being in 1.5 - 2 km offshore, with a maximum depth of 10 m, and in a zone with very high eutrophication. All that affects the community and the characteristics of specimens.

S.E. STANCYK from Columbia, U.S.A.:
- Large male-small male sex ratio inheritance in Euterpina acutifrons (Harpacticoida). Examination of the effects of

parentage, environment and population on the frequency of large and small males in a free-living copepod with dimorphic males.
- Tidal influence on the distribution of zooplankton in a high-salinity estuary.
- Long-term studies of zooplankton populations in a high-salinity estuary (part of the Long-term Ecological Research Program at North Inlet, South Carolina). Particular interests in long-term variation in production and abundance relative to other simultaneously measured biotic and abiotic ecosystem components.

S.-i. UYE from Hiroshima, Japan:
- Production estimate of marine copepods appearing in the Inland Sea of Japan.
- Life history of the brackish water copepod Sinocalanus tenellus with special interest in its resting eggs.
- Impact of copepod grazing on red-tide phytoplankton.

H.A. VANDERPLOEG from Ann Arbor, U.S.A.:
I am doing traditional studies on the feeding behaviour of Diaptomus in mixtures of different algae as well as on lake seston. I am in the process of setting up a laboratory for making high-speed motion pictures of freshwater copepod feeding. Dr. I.-A. Paffenhöfer is helping me to design the laboratory.

W. VERVOORT from Leiden, Netherlands:
I have retired from the chair of Systematic Zoology, Leiden University, and the directorate of the Rijksmuseum van Natuurlijke Historie. All my free time is now devoted to research on Copepods and Hydroids. I hope to pursue two topics, viz. a copepod bibliography, of which the first part (a-m) is almost ready, and the continuation of the Snellius Calanoid Copepod series.

M.H. VILELA from Lisbon, Portugal:
Cultures of several copepod species are kept in the laboratory by myself to life cycle and physiology studies and also to

produce bigger volumes for Aquaculture purposes.
At the moment I am carrying out some production experiments with the harpacticoid copepod Tigriopus brevicornis reared on various feeding regimes in order to evaluate the diet which will give better yields on a future mass cultivation.

P. VITIELLO from Marseille, France:
Relations meiofauna-pollution

R. WILLIAMS from Plymouth, England
Zooplankton ecology - flow of carbon through pelagic ecosystems, vertical distribution and migration, population dynamics - on shelf and open ocean.

T. WOOLDRIDGE from Port Elizabeth, South Africa:
Estimates of production of the major species (3) of copepods occurring in our local estuaries. A start has also been made on predation effects on these respective populations. Finally, we hope to put all these data together in an energy flow diagram for the respective estuaries.

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Paul Illg Paul Illg

On his 70th birthday, congratulations and best wishes to Paul L. Illg, born on 23 September 1914. He was educated on both east and west coasts, receiving a Bachelor of Science degree in 1936 and a Master of Science in 1941 from the University of California at Berkeley, and in 1952 a Ph.D. from George Washington University, Washington, D.C. After positions at the United States National Museum and at George Washington University, he joined the faculty of the University of Washington where he taught from 1952-1982. For many years he taught summer courses at the Friday Harbor Laboratory of the University of Washington. He is now (1982-) professor emeritus at the University of Washington.
During his career he has been President of the Society of

Systematic Zoology (1968) and a member of the Council of the American Society of Zoologists (1967-68).
He has been active in many national and international societies: National Academy of Sciences (Committee on Research in the Life Sciences, National Research Council, 1966-67); ad hoc committee on Invertebrate Zoology, United States National Museum, 1967; Pacific Science Congress, Japan, 1966; U.S.-Japan Conference on Plankton Sorting Center, Shimizu, Japan, 1966. Consultant and visiting scientist, Japan: Seto Marine Biological Laboratory, Kyoto University, Shimoto Marine Laboratory, 1970; visiting professor, Muséum National d'Histoire Naturelle, Paris, 1978-79.
Paul's research interests have been in the systematics and morphology of copepods and the symbiosis of crustaceans. His publications cover a wide spectrum of studies on copepods - pseudanthessiids, clausidiids, myicolids, and especially notodelphyids and ascidicolids. His studies on the cyclopoid copepods living with ascidians are benchmarks for copepodologists.
Paul is fondly remembered by his students and all those who have spent summers at Friday Harbor. The impact of this kindly and thoughtful man has had a positive effect on the lives and professional development of many young scientists. All wish him well in the coming years.

A.G. Humes

The l e t t e r box

L.S. Roberts from Lubbock, U.S.A., points out:

In reference to Geoffrey Fryer's comment, quoted on page 12 of the recent MONOCULUS, I wish to point out that the textbook of which I am coauthor (Foundations of Parasitology, The C.V. Mosby Co., St. Louis, MO, USA) is certainly an exception. It has a very good chapter on parasitic Crustacea, if I may be so immodest to say so. It will be better in the next edition, which is scheduled for publication the end of this year.

The chapter was reviewed for me for the first edition by Dr. Z. Kabata and Dr. A. Humes.

V. Øresland from Stockholm, Sweden, introduces a new idea:

Would 'MONOCULUS' be interested in publishing constructions or ideas for products which are not available on the market and which may have practical value in planktology?
(See two examples on the next two pages.)

B O O K Book review R E V I E W

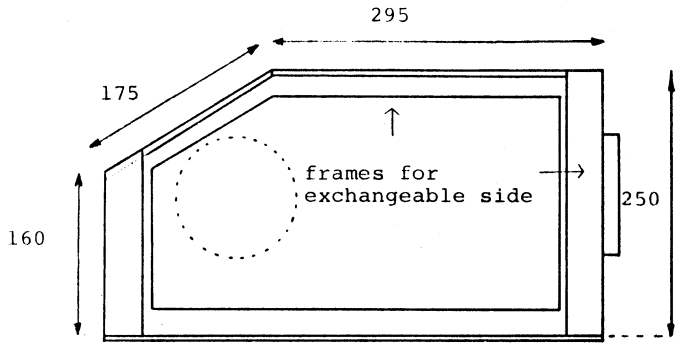
Möller, H. & K. Anders - 1983: Krankheiten und Parasiten der Meeresfische. Verlag Heino Möller, Kiel, 258 pp.

This excellent introduction to "Diseases and Parasites of Marine Fish" begins with a brief "key" to the major disease symptoms of various fishes, illustrated by clear line drawings. More detailed descriptions of the diseases follow. A large part of the book is occupied by descriptions of the major groups of parasites including information on their biology and excellent line drawings (those of copepods are largely based on Kabata's illustrations in "Parasitic Copepoda of British Fishes"). A brief description of methods used in examining fish for disease symptoms is given, followed by a discussion of causes of increased disease rates and some useful case studies. Lists of parasites and of popular as well as scientific names of fishes, and 56 excellent colour photos arranged in 14 plates conclude the book. Over 600 references are given.
The book can be strongly recommended to research workers and students interested in diseases of marine fish. Although almost all examples are taken from northern cold-temperate waters and particularly the northern Atlantic, it will be useful to those who work on Pacific and warm water fishes.

K. Rohde

Side

lenght in mm



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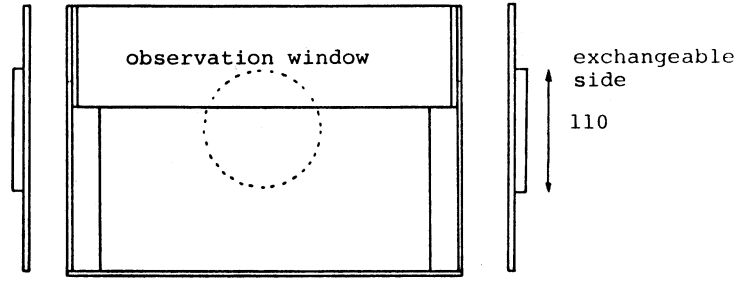

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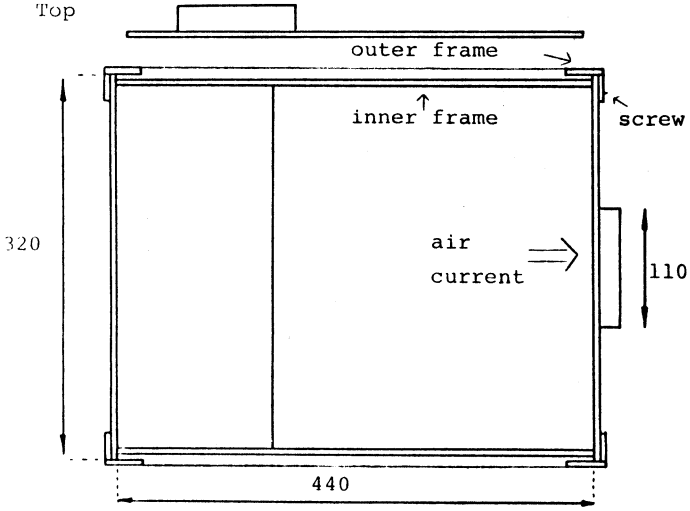
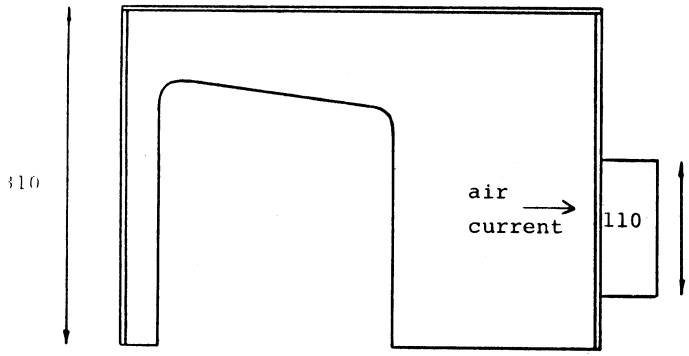


WORRIED ABOUT FORMALDEHYDE?

This is a sorting box for e.g. macrozooplankton, ichthyoplankton and macrobenthos preserved in formaldehyde. With exchangeable sides (which can be specially designed) it is possible to use the same box for many different purposes. The side is lifted upwards for objects to be put in or taken out of the box. When sorting small animals, a magnifying glass can be mounted above the observation window.

The box is made of 4 mm thick plexiglass and is glued together. The observation window is made of glass and fastened with aquarium silicone. Plastic tubes are mounted on the circular openings. The outer frames are fastened with screws to allow adjustments to be made.

Side



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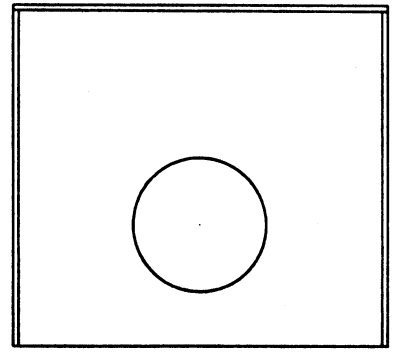

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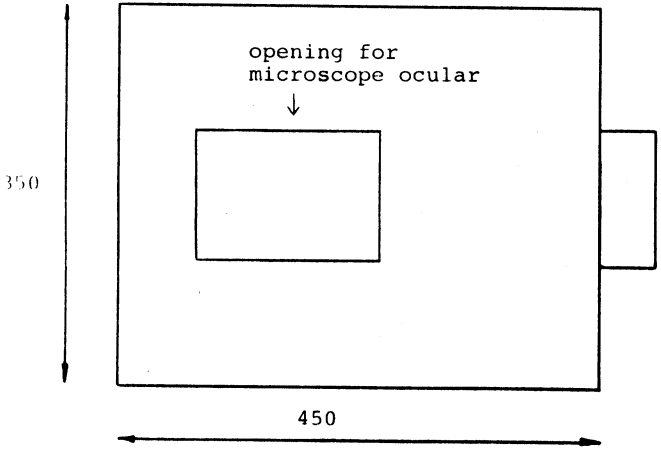

This is a plexiglass box to be used when sorting or analysing formaldehyde-preserved samples through a stereo microscope. To remove the microscope you lift the box.

These two boxes have been used without any complications for several years for sorting out large and small chaetognaths from zooplankton samples.

Do you have any constructions or ideas for products which are not available on the market and which may have practical value in planktology? Or do you know any methods which make work easier, but which you think are too simple to publish? Let us collect these simple (but often valuable) ideas and let others know about them! So, please, contact: Vidar Øresland, Department of Zoology, University of Stockholm, S-106 91 Stockholm, Sweden. Tel. 08-34 08 60, or Kurt Schminke.

ANNOUNCEMENTS

Here is a suggestion by Frank Ferrari from Washington, U.S.A., which he circulated in a recent letter:

During a recent phone conversation, Dr. Mark Shih, Chairman of the Organizing Committee for II COPEPODA, suggested I coordinate an informal, open session on Tuesday evening, 14 August. At this session, conference participants would discuss individual research questions or topical problems of a more general nature. Mark and I believe that a spontaneous discussion may be difficult to maintain. By circulating this letter to participants before the conference, we hope to give you an opportunity to consider topics for this open session. If you will send me your suggestions by letter prior to the conference, or present them to me soon after the conference convenes, I can determine if there are some topics of more common interest than others. I am enclosing my own examples of such questions in hopes of stimulating your interest in this session.

Examples:

In pelagic oceanic communities of boreal and polar seas a few calanid/eucalanid copepods comprise a herbivore component which undergoes a seasonal, non-feeding, quiescent period in waters below 400-500 m. The seasonal upward migration of these calanoids into the epipelagic region generally coincides with initiation of seasonal primary production. This migration marks the beginning of the animal's herbivory, as well as their ontogenetic development. Later, a seasonal, downward migration by these herbivorous copepods may initiate their predation by upward-migrating, deep-living euchaetids. Do these episodic behavioral changes reflect discrete energy transfer events in these pelagic oceanic communities? If so, to what extent do these events describe the predominant energy transfer pathways in such communities?

In defining phylogenetic relationships among organisms, several methods are used to establish primitive vs derived character states. Although Cladistic (or Phylogenetic Systematics) analyses may utilize ontogenetic information restricted to the group of organisms being analysed (the ingroup), this methodology has not been well-articulated. Outgroup comparisons are of far more widespread use in determining primitive vs derived conditions. Outgroup comparisons involve study of character states within the group being analysed, and in related organisms (the outgroups) not included in the analysed group. The methodological formalism associated with outgroup comparison often requires knowledge about the degree of relatedness of outgroups to the organisms being analysed. A previously established system of relationships seems implicit in the methodology of outgroup comparisons. If this previously established system is incorrect is the Cladistic analysis self-vitiating? If this previously established system is correct is the Cladistic analysis tautological?

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II. U.S.A.

We have found it difficult to outline a simple procedure a foreign scholar could follow to obtain funds for a research visit to the United States. The federal government of the United States is much larger, but less centralized, than those of many European countries, e.g. West Germany's. There are numerous divisions and offices within the federal establishment which might support such visits. In addition there are many private foundations which may also provide funds for visiting scholars. Based on this absence of central operational authority, we make these suggestions to a copepodologist colleague interested in a research visit.

First contact an associate with whom you wish to work here in the United States. Your associate's place of employment at a state or private university, or laboratory funded by federal, state, or local authority may dictate how funds for a foreign scholar can be secured. Your American associate may have ideas about such funds based on previous experience. For further information both foreign scholar and associate may wish to use the following publications which provide information about granting agencies in the United States.

Grants is published by Oryx Press in Phoenix, Arizona. It lists numerous sources of funds available from the federal government of the United States, including specific programs designed to facilitate exchange between individual countries and the United States. THE FOUNDATION CENTER in New York prints a series of booklets about private foundations. Foundation Directory lists private foundations and their expenditures for the year. It also outlines their general purposes and often includes categories of work that a particular foundation will not support. Foundation Grants Index lists each individual grant given by each foundation to specific recipients with purpose of grant and amount of funding.

Information contained in these publications also is available through Dialog Information Services, Inc., a computerized information retrieval service. In addition to a main office in Palo Alto, California, Dialog Information Services, Inc. maintains regional offices in Canada (Toronto), Japan (Tokyo), Australia (Haymarket), and Europe (Oxford & Köln). Access to its data files is gained by terminal/telephone connection. Many academic libraries have accounts with Dialog, and so can obtain access to the information. We have used our connection and account here at the Smithsonian Institution Libraries to search several files.

In querying these files we have used the following keywords in various combinations - fellowship, international, exchange, science, marine, oceano. (truncated) - and combined them with the name of a specific country.

Karen Preslock
Frank Ferrari

(A computer sheet with examples is added but is not printed clearly enough to be reproduced here.)

Laboratory cultures of copepods

In *MONOCULUS* No. 6 we asked who keeps which species under laboratory conditions and whether cultures are permanent or temporary (temp.). Here is the result of our inquiry in a list put together by Hans Dahms.

CALANOIDA

Acartiidae -	Acartia italica (Gaudy, R.: temp.) Acartia clausi (Ives, J.P.: temp./Klein Breteler, W.C.M./Sekiguchi, H.) Acartia longipatella (Wooldridge, T.H.) Acartia tonsa (Tester, P.A.) Paracartia africana (Brownell, C.L.)
Calanidae -	Calanus sp. (Williams, R.) Calanus pacificus (Taniguchi, A.: temp.) Calanus hyperboreus (Corkett, C.J.: temp.) Calanus helgolandicus (Burkill, P.H./ Klein Breteler, W.C.M.) Calanus finmarchicus (Klein Breteler, W.C.M.) Calanoides carinatus (Brownell, C.C.)
Centropagidae -	Calanipeda aquae-dulcis (Vilela, M.H.) Centropages hamatus (Klein Breteler, W.C.M.)
Diaptomidae -	Diaptomus clavipes (Elmore, J.L.) Diaptomus arcticus (Hebert, P.D.N.: temp.) Diaptomus victoriaensis (Hebert, P.D.N.: temp.) Diaptomus tyrrell (Hebert, P.D.N.: temp.) Megadiaptomus hebes (Ranga-Reddy, Y.) Tropodiaptomus spectabilis (Rayner, N.A.: preserved material) Metadiaptomus transvaalensis (Rayner, N.A.)
Oncaeidae -	Oncaea curta (Björnberg, T.K.S.)
Paracalanidae -	Paracalanus parvus (Sekiguchi, H.)
Pseudocalanidae -	Pseudocalanus sp. (Corkett, C.J.: temp./ Ives, J.D.: temp./Klein Breteler, W.C.M.)
Pseudodiaptomidae -	Pseudodiaptomus nudus (Brownell, C.L.) Pseudodiaptomus hessei (Brownell, C.L./ Wooldridge, T.H.) Pseudodiaptomus acutus (Blades-Eckelbarger, P.: temp.) Skistodiaptomus oregonensis (Pinel-Alloul, B.: temp.)

Temoridae -	Eurytemora velox (Gaudy, R.: temp.) Eurytemora hirundoides (Castel, J.: temp.) Eurytemora affinis (Burkill, P.H.) Heterocope septentrionalis (Hebert, P.D.N.) Temora longicornis (Klein Breteler, W.C.M.)
CYCLOPOIDA	
Cyclopinae -	Diacyclops bicuspidatus thomasi (Pinel-Alloul, B.: temp.)
Cyclopinidae -	Cyclopina norvegica (Vilela, M.H.)
Eucyclopinae -	Tropocyclops prasinus mexicanus (Pinel-Alloul, B.: temp.) Macrocyclops albidus (Dussart, B.)
Halicyclopinae -	Halicyclops dedeckeri (Brownell, C.L.)
HARPACTICOIDA	
Canthocamptidae -	Mesochra lilljeborgi (Castel, J.: temp./ Vilela, M.H.)
Canuellidae -	Canuella sp. (Brownell, C.L.: temp.)
Cletodiae -	Cletocamptus sp. (Vilela, M.H.) Cletocamptus trichotus (Brownell, C.L.: temp.) Cletocamptus confluens (Castel, J.: temp.)
Diosaccidae -	Amonardia normani (Castel, J.: temp.) Paramphiascella vararensis (Rieper, M.) Amphiascoides debilis (Rieper, M.)
Ectinosomidae -	Ectinosoma dentatum (Vilela, M.H.)
Harpacticidae -	Tigriopus californicus (Burton, R./ Brownell, C.L.) Tigriopus japonicus (Tseng, W.-Y.) Tigriopus brevicornis (Vilela, M.H.) Harpacticus sp. (Vilela, M.H.)
Laophontidae -	Heterolaophonte sp. (Vilela, M.H.) Microlaophonte trisetosa (Boxshall, G.A.)
Longipediidae -	Longipedia weberi (Brownell, C.L.)
Tachidiidae -	Euterpina acutifrons (Brownell, C.L./ Gaudy, R./Moreira, G.S./Vilela, M.H.) Microarthridion littorale (Palmer, M.A.)
Tisbidae -	Tisbe sp. (Vilela, M.H.) Tisbe holothuriae (Brand, E.W./Brownell, C.L./Bergmans, M./Gaudy, R./Rieper, M.) Tisbe furcata (Bergmans, M.) Tisbe bulbisetosa (Bergmans, M.) Tisbe gracilis (Bergmans, M.) Tisbe battagliai (Bergmans, M.) Tisbe celata (Do, T.T.)

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MONOCULUS - Library: **MONOCULUS** - Copepod Newsletter is issued free of charge. In exchange it is expected that all copepodologists send reprints of their publications to Kurt SCHMINKE regularly in order to help building up a reprint library open to everyone who may have literature problems. So don't forget to put the **MONOCULUS**-Library on your mailing list.

MONOCULUS - Bibliography: All titles sent to the **MONOCULUS** - Library also serve to keep up the current bibliography published regularly in the newsletter. This bibliography can only be up to date if everyone informs Kurt SCHMINKE about his latest publications as soon as they have appeared by sending him reprints of these publications. It is intended to issue a computerized "Bibliography of the Works of Living Copepodologists" in time for the Second International Conference on Copepoda in 1984. For this the complete lists of publications of all copepodologists are needed. So far only a little more than one third of the receivers of the newsletter have sent their lists. The remainder are kindly requested to do so as quickly as possible. The list should be addressed to Kurt SCHMINKE.

Directory of Copepodologists: This bibliography will never be complete if not all copepodologists are brought to the attention of **MONOCULUS**. We are far from having all copepodologists on our mailing list. Suggestions of new candidates for this list should be addressed to Gerd SCHRIEVER.

MONOCULUS - Museum: The Museum is meant to build up a comprehensive collection of copepod species from all parts of the world. The Museum does not want type or paratype material but authenticated (voucher) specimens of as many common (and less common) species as possible. The Museum will act as a base for material which might not be available from other sources. If contributions would be made from all over the world, this collection could serve as a base for phylogenetic, morphological and zoogeographical studies. Tubes and vials containing specimens of only one single species each may be sent properly labelled to Gerd SCHRIEVER.

MONOCULUS - Glossary: The glossary aims at compiling a comprehensive list of all terms and their exact definitions currently used by copepodologists. Besides the more general terms there are specific ones applicable only to particular groups and stages. Specialists are urged to provide lists with terms (and their definitions) which are in use in their field of research. The lists should be sent to Kurt SCHMINKE.