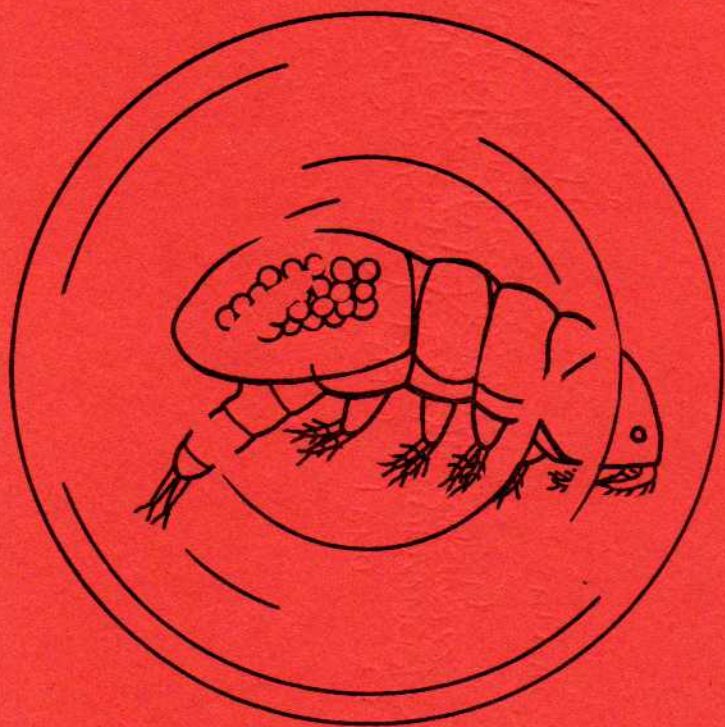


MONOCULUS

copepod Newsletter



Nr. 5

November 1982



Bibliotheks- und Informationssystem der Universität Oldenburg
North American Edition reproduced by National Museums of Canada

MONOCULUS

Copepod Newsletter

Number 5

November 1982

Edited by: H. Kurt Schminke, Fachbereich 7 (Biologie), Universität Oldenburg, Postfach 2503, D-2900 Oldenburg, W. Germany.

Gerd Schriever, Zoologisches Museum der Universität Kiel, Hegewischstr. 3, D-2300 Kiel, W. Germany.

Cover by: Georg Siebecke, Zoologisches Museum der Universität Kiel.

Produced by: H. Kurt Schminke and Bibliotheks- und Informationssystem (BIS) der Universität Oldenburg, Ammerländer Heerstr. 67/99, D-2900 Oldenburg, W. Germany.

For North America by: Chang-tai Shih, Division of Invertebrate Zoology, National Museum of Natural Sciences, Ottawa, Ontario, Canada K1A 0M8

(This document is not part of the scientific literature and is not to be cited, abstracted or reprinted as a published document.)

It is with a deep sorrow
that I am informing you
about the death of my wife,
the late Dr. JADWIGA GRABDA
who passed away on 20 November, 1981.

Eugeniusz Grabda

Deadline for the next issue of *MONOCULUS*: 15 March 1983

E d i t o r i a l

Isn't it fine to have a deadline for contributions to *MONOCULUS*? It appears that indeed it is. It gives you a rough idea of when the next issue will be in your hands and in case you have sent in a contribution you will be enabled to guess when to expect it to appear. When going through this issue of *MONOCULUS* you will notice that the number of those who have started to take an active interest in our newsletter is growing. *MONOCULUS* is on the way of really becoming a common enterprise where shares are taken by more and more colleagues. We suspect that the deadline has something to do with this development as it seems to signal a transition to a more orderly appearance of *MONOCULUS*.

My compliments on 'MONOCULUS' which is always welcome when it appears (somewhat erratically) in my mailbox, started one of the letters which we received some time ago. Erratic appearance, it is true, has been one of the constant features of MONOCULUS in the past and despite the deadline, we are afraid, this feature will remain. We are not professionals, obviously, and odd obstacles (personal and financial) keep cropping up unexpectedly.

What is for sure, however, is that *MONOCULUS* will appear twice a year. Yet it will continue to strike you as a surprise. We hope you don't mind and respect the deadline all the same. *MONOCULUS* is a newsletter not a journal, and letters from good friends, as you know, are spontaneous and quite incalculable. *MONOCULUS* also is a present as it is still issued free of charge and what is more disappointing than a present that is not a surprise?

A new project will be started in this issue of *MONOCULUS* which we hope will arouse your interest and stimulate your active participation, the *MONOCULUS*-Glossary. Thanks to the delay we are also able to include the first announcement of the Second International Conference on Copepoda already.

We wish you a Merry Christmas and all the best for the next year.

H. K. S.

J. Smit

Business ssenisuB

1. Bibliography

There are 15 more asterisks to be accorded. Here are the laureates: Connell, Cooney, Damkaer, Eiselt, Fiers, Gardner, Goswami, Heip, Kahan, McKinnon, McQueen, Rippingale, Schnack, Walker, Yeatman.

Hans-Uwe Dahms (we called him Gerd last time, God knows why) has returned from Hamburg where he studied for a while and has resumed his work with the computer. Iris Zaehle helped out in the meantime and prevented the computer from dying of starvation. Jürgen Sieg suggested that a first issue of our computerized bibliography should be produced in time for the Second International Conference on Copepoda. We want it to be as complete as possible but about 240 people haven't sent their lists as yet. Please, send a complete list of your publications on Copepoda to Kurt Schminke and add reprints of those papers that are still available.

2. MONOCULUS-Library

Our library is not taken seriously as yet by many of you. When we looked through last years' commercial bibliographies we came across many publications of which we have not received a copy. Don't forget, *MONOCULUS* is issued free of charge, and if you want to give something in return we would be delighted if you supported the idea of the *MONOCULUS-Library* and sent us your latest reprints regularly. Please, put the *MONOCULUS-Library* on your list for quick mailing! Kurt Schminke is in charge of it. Help to make the bibliography of recent literature published in *MONOCULUS* to be as up to date as possible.

3. MONOCULUS-Museum

The shelves are as bare as ever. However, there is some encouragement. Ian Sutherland from Ottawa sent the following consolatory lines: *I would not worry about the slow reaction to your request for material for a MONOCULUS-Museum. As a museum scientist I have found that it takes quite some time to prepare specimens for my own institution, and probably Dr. Schriever has had the same experience. I have also found that, in North America at least, ecologists are, for some reason, often reluctant to depo-*

sit their materials in a museum. Just keep pushing the idea in MONOCULUS newsletter, and I hope there will, in time, be success. I am currently putting aside some specimens for this purpose, but I have not yet got around to writing out complete labels.

Shall Gerd start to dust his shelves already?

4. Directory of localisation of types of Copepoda

The only response we received was by Brian Marcotte from Montreal. He wrote: *A catalogue of the Harpacticoida in the British Museum (Natural History), which I prepared, has just been published by the BMNH as a booklet and fiche. The catalogue includes a list of all material, type designations, possible (probable) synonymes and notes on the physical condition of slides. This catalogue may help you in the formation of a "directory of localisation of types of Copepoda".*

5. Mailing

The distribution of MONOCULUS No. 4 was not hampered by strikes or any other adverse events. According to Chang-tai Shih who produces the North American Edition at the National Museums of Canada the time-table was as follows:

- May 27: Received the original MONOCULUS No. 4;
- June 1: Delivered original MONOCULUS No. 4 to printer for reproduction;
- June 9: Received 200 copies of N. American version of MONOCULUS No. 4;
- June 11: Delivered MONOCULUS No. 4 to all North American recipients.

858585858585858585

B I R T H D A Y S

858585858585858585

Friedrich Kiefer

Friedrich Kiefer

When my interest arose in freshwater copepods one of the names in the literature I became familiar with very quickly was that of Friedrich Kiefer. A special box of my card-index eventually had to be reserved for this author alone as the amount of cards accumulating behind his name quickly grew to a size that expel-

led whatever cards with titles by other authors had been in the box as well before. To date Prof. Kiefer's list contains more than 280 publications (including several books) on freeliving freshwater copepods, and every year a few more are added to this list. Prof. Kiefer is now 85 years old.

He was born in Karlsruhe (W. Germany) on the 6th of September 1897. In 1921 he published his first paper on copepods. At the start, he dealt with cyclopoids and harpacticoids only but turned his interest to the calanoids later as well. The systematics of these groups were rather obscure in those days and only starting to take shape. Kiefer vigorously helped to clear the ground with his revisions of the cyclopoids in 1928 and of the diaptomids of the Old World in 1932. By the time of the great limnological expeditions between 1927 and 1936 his reputation as a leading taxonomist was thus firmly established and it was clear that he would be among those who would be offered the copepods for study which had been brought back from these expeditions.

All this work he did in his spare time at night or in the afternoon whenever possible. Kiefer was a school teacher for 45 years of his life. First he taught at primary schools, later at high school and at a teachers' training college. He retired as professor of the Humboldt-Gymnasium at Konstanz on the 1st of October 1962.

Since 1924, after Kiefer had taken part in a course on limnology at Konstanz under Prof. Max Auerbach, director of the "Anstalt für Bodenseeforschung", he became connected with this Institute. These connections became even more intimate when in 1946 he was appointed teacher at the Humboldt-Gymnasium at Konstanz. The limnology of the Bodensee (Lake of Constance) advanced to the second major field of his research besides the copepods. At a time when conservation and pollution problems were still widely neglected and not taken seriously at all, Kiefer raised his voice already and warned against the ill effects of the growing eutrophication of the lake. Today we tend to forget how courageous it was in those days to stand up against commercial and administrative interests and pressures. When Prof. Auerbach retired Kiefer succeeded him in 1963 as honorary director of the Anstalt für Bodenseeforschung where he still works today.

Prof Kiefer can look back on a life full of work, of ample experiences, of achievements and of recognition. In 1951 already he was promoted honorary doctor of natural sciences (Dr. h. c.) by the Faculty of Mathematics and Physical Sciences of Freiburg University. When I think of him I remember his private library which he showed me when I visited him as a young scientist years ago and through which I walked with admiration and a feeling of great curiosity. This library is a mirror of his broad interests and his huge collection of specimens from all parts of the world is a mirror of his constant scientific activities encompassing several aspects of copepodology.

MONOCULUS wishes Prof. Kiefer all the best and congratulates him (with the usual delay) on his 85th birthday.

H.K.S. with the help of U. Einsle

P.S. *MONOCULUS* takes the occasion of thanking Prof. Kiefer for his donation of 150,00 DM mentioned in the last issue but not yet acknowledged in a proper way officially.

808080808080808080 B I R T H D A Y S 808080808080808080

Théodore Monod

Théodore Monod

Interviewing copepodologists

Castellane is a small town in the southern Alps of France. The town and the River Verdon which is famous for its grand canyon (Gorges du Verdon) further downstream lie to your feet when you climb up to the chapel above the town on one side of the valley and a magnificent view opens over the steep surrounding mountains. Up there I stood when I passed through Castellane on my way to the 17th (and last) International Congress of Zoology at Monte Carlo in 1972 training for my first appearance on the international scene, in my hands the manuscript of the little lecture I was going to give at that Congress.

I remember it was with great excitement that I was looking forward to this event because I was to meet a number of great zoologists in Monaco among them Théodore Monod, the chairman of the

symposium to which my contribution belonged. The excitement before conferences has diminished somewhat, once I knew what they are like but the curiosity for people has remained who impress either by their competence or by their personality or both. When I met Th. Monod again in Amsterdam at the First International Conference on Copepoda last year he was the same as 9 years before: alert, vivid, charming, and overboarding with tales, anecdotes and interesting facts and details from the most diverse sciences.

I am a naturalist of the 18th century, he said when we sat down for this interview in the lounge in front of the main lecture room where a discussion was about to rage on the phylogeny of Copepoda. I missed out on it because Monod insisted on making the interview straight away when I asked him for it. *Il faut s'en débarrasser tout de suite*, he muttered and then came back to the notion of naturalist which today, he felt, unfortunately has a negative connotation. *Il faut les deux*, he said, *science if it is to prosper needs them both, people with special and those with wide interests*. When I tried to find out what wide meant in his case it turned out that he has published in the following fields: zoology, botany, geology, geography, archeology, history, and ethnography.

"For me as a zoologist your name is primarily connected with the *Thermosbaenacea*", I said. Sure, the *Thermosbaenacea* probably are the group which made me famous, was the answer, but they were only a short, if lucky episode of my zoological work. "Lucky, why?" Well, I was a very young scientist, assistant at the *Muséum National d'Histoire Naturelle*, when L. G. Seurat from the University of Algiers came along with a tube containing some tiny crustaceans he had collected in a hot spring in Tunisia. He thought they might be something particular and showed them to a more important and experienced person in the *Muséum* than I was in those days. But this person hardly looked at them and gave them back to Seurat. Evidently, there was nothing particular about them. So finally the tube landed in my hands and I found myself in the privileged position of having to describe a new order of Crustacea. Before I actually did it I discussed that matter with W.T. Calman in London who agreed with me that they really were something completely new. I received a brilliant smile. "Let us turn to your

main work in zoology, which group stood in its center?" *There were two groups, as a matter of fact. I started with crustaceans and later when holding the chair of 'Pêches outre-mer' at the Muséum did a lot of work on fish, but the crustaceans have remained my group of predilection.*

"Why just Crustacea", I wanted to know, "what made you becoming involved with them?" *A field trip to Roscoff when I still was a student brought the early decision in 1920, I think. He raised the eyebrows and quickly dropped them again. Yes, it probably was in 1920 with Louis Barrabé, a geologist. We crossed the railway bridge over the River Penzé and examined the hardened mud alongside the bridge. There I had my first encounter with Paragnathia formica, a burrowing isopod which struck me because of its extreme sexual dimorphism. Its larvae, the praniza-larvae, are parasitic on fish and are red or green depending on the kind of fish they haunt. I finally devoted my PhD-thesis to the family to which they belong: Les Gnathiidae.*

I started to wonder which role the Copepoda had played in his work. Although marine isopods had been the main target of his interest there is hardly a group of Crustacea he has not touched upon. He has published on Anostraca, Conchostraca, Branchiura, Ostracoda, Cirripedia, Stomatopoda, Decapoda, Thermosbaenacea, Tanaidacea, Isopoda, Amphipoda,... and Copepoda. It was more a matter of chance that I turned to the Copepoda as well. On my first trip to Mauretania in 1922 I collected a lot of parasitic copepods but these have been studied by A. Brian. Later I did some work myself on parasitic copepods of molluscs and fish. The last Copepod I studied belonged to the genus Bo-molochus which I had collected on Tylosurus from Madagascar.

It struck me that Africa was mentioned ever so many times during our talk, and Th. Monod explained why. I have spent 25 years of my life in West Africa where I was director of the 'Institut Français d'Afrique Noire' in Dakar. This allowed me to pursue my studies of desert regions which I had begun during my first trip to Africa in 1922. Instead of returning by boat from Mauretania I then traversed the Sahara from north to south down to Senegal. I later also spent my military service in the desert as 'chamelier de deuxième classe', not just a very high degree, I

am afraid. After that I made several expeditions to the Central Sahara and when this became known among my colleagues some of them started to ask me whether I could bring back for them material which they were unable to obtain by themselves. I did this whenever possible.

Once Schmidt-Nielsen asked me to get urine of the Mendes-antelope (Addax nasomaculatus) for him. He sent me a box containing 20 vials which I took with me on one of these trips. When the Bedouins who accompanied me had killed one of these antelopes, we first drank the contents of the paunch. He noticed my sceptical, if not slightly disgusted face and continued: The paunch juice is very refreshing when constant thirst is tormenting you. Anyhow, I then started to fill Schmidt-Nielsen's vials and managed to fill 18 of them. What should I do with the remaining two? I thought it would be a pity to throw them away and decided to fill them myself. For the first, this was done on the spot and I labelled it 'Urine of a Christian who hasn't had enough to drink for three weeks'. The second I filled when back in Dakar and labelled it 'Urine of a Christian in his normal environment in Dakar'. I am not aware that the analysis of the contents of these two vials has ever been published. A pity, isn't it?

"What will your next publications be about?" I asked him after we had talked at length about his fascinating historical studies on the last trip of the Major Alexander Gordon Laing (1825-26), on George Glas (1764) and on the history of the Island of Arguin off Mauretania which had passed from Portuguese, to Dutch, Prussian and finally to French occupation. My next publications will be a few chapters for the volume on Crustacea of the 'Traité de Zoologie'. There will be a chapter on Crustacea and the biosphere, one on the economic importance of Crustacea, another on the history of the systematics of Crustacea and, of course, one on the Thermosbaenacea. I will not rule out that I may be tempted in the meantime by some material that needs identification.

We stood up from our table when people started to stream back from the discussion on copepod phylogeny. Are you having lunch now? "No" I said because I was speculating on an opulent meal at night in one of the Indonesian restaurants in town. Monod was surprised at my answer. *Est-ce que vous jeûnez?* That is what he is doing since the times of his desert expeditions. He fasts one day a week. "I am

afraid not", was my answer and I was about to add "except that I fast scientifically from time to time because of administrative commitments". I was glad to have swallowed that. He would probably not have understood. A week or so after the conference in Amsterdam Monod sent me a book of 127 pages entitled "Notice sur les Titres et Travaux Scientifiques de Théodore Monod" published in 1963. It is amazing the functions he has had, yet his list of publications is immaculate and without the slightest gap.

P.S. Théodore Monod's 80th birthday was on the 9th of April this year. *MONOCULUS* sends its best wishes a little late, it is true, but we wanted them to be connected with this interview.

GEORGIANA BAXTER DEEVEY (1914 - 1982)

Her Work on Copepods

For over three decades Georgiana Baxter Deevey contributed to our knowledge and understanding of the biology of planktonic copepods. This short sketch of her copepod work only begins to outline her scientific interests, for she made significant contributions to the biology of many planktonic animals, particularly ostracods, and to arachnids with which her early work was concerned.

While at the Woods Hole Oceanographic Institution (1943-1946), Georgiana began her work with copepods during a study of the zooplankton of Tisbury Great Pond, on Marthas Vineyard, Massachusetts. The results, published in 1948, exhibit a marvellous depth and breadth of information. In analyzing plankton samples collected weekly from May 1945 to September 1946, Georgiana documented seasonal changes in the abundance of the calanoids Acartia tonsa, A. clausi, Eurytemora hirundoides, and the cyclopoid Oithona similis. She noted that adventitious species Centropages hamatus, Paracalanus crassirostris, and Halicyclops magniceps, along with benthic harpacticoids, often were collected in the Clarke-Bumpus net. Georgiana found the abundance of nauplii, immature copepods, and adults of the common calanoids was related to both temperature and salinity of the pond, and that total body length varied in the two species of Acartia and Eurytemora hirundoides.

Returning to Yale University in 1946 Georgiana extended her work on the coastal copepod fauna of the western Atlantic south to Block Island Sound (1952a & 1952b), Long Island Sound (1956), and Delaware Bay (1960a). Block Island Sound is a dynamic area with both neritic and estuarine animals. In addition to seasonal variation in abundance of Centropages typicus, C. hamatus, Pseudocalanus minutus, Temora longicornis, Acartia tonsa, Calanus finmarchicus, and Monstrilla anglica, Georgiana also noted seasonal size variation of the two Centropages and in dry weights of the first. The copepods Georgiana found in Long Island Sound and Delaware Bay were more typically estuarine with few neritic species.

Georgiana's visit to Laboratorio Costero de Investigaciones Pesqueras at Grao, Castellon, Spain, in 1957 contributed to a more extensive study of body length variation in common marine calanoids (1960b). She initially had documented size variation in the two Centropages of Block Island Sound. She now added measurements of six species from Delaware Bay, Centropages typicus, C. hamatus, Pseudocalanus minutus, Labidocera aestiva, Acartia tonsa, and Pseudodiaptomus cornutus, to those of Centropages typicus from the Mediterranean Sea, and Pseudocalanus minutus and Temora longicornis from Long Island Sound. Information from the literature on Acartia tonsa and A. clausi from Long Island Sound, and Calanus finmarchicus, Pseudocalanus minutus, Microcalanus pygmaeus, Acartia clausi, and Centropages hamatus from Loch Striven also contributed to her study, Georgiana discussed variation in body length of these different animals in relation to temperature, availability of food, and number of generations produced by the animals in a year.

Georgiana continued length frequency analyses in her first (1964) of many papers about oceanic copepods collected at Station 'S', 32° 10'N, 64° 31'W, in the Sargasso Sea, 24 km southeast of Bermuda. Five species, Pleuromamma piseki, P. abdominalis, P. xiphias, Haloptilus longicornis, and Lucicutia flavicornis, had been collected intermittently over 18 months. Georgiana found that female cephalo-thorax lengths exhibited a cyclical variation, and in the first three species this variability correlated with the quantity of phytoplankton collected at the station.

A trip to New Zealand in 1964-65, as a guest of the Department of Zoology, University of Canterbury in Christchurch, gave Geor-

giana an opportunity to extend her studies of size variation to copepods of the South Pacific Ocean. Common calanoids from 24 samples collected between April 1964 and May 1965 off the Kairoura Peninsula at latitude 42° 25'S were identified as Acartia clausi, Centropages aucklandicus, Paracalanus parvus, Clausocalanus arcuicornis, and Calanus australis. Georgiana found that cephalothorax length variation in the first two species correlated with both temperature and phytoplankton availability. She also noted both factors affected cephalothorax length in A. clausi from Loch Striven while temperature alone explained this variation in animals from Long Island Sound.

In 1965 Georgiana returned to her studies of North Atlantic copepods. While on the staff of the Bermuda Biological Station she worked at Dalhousie University in Halifax, Nova Scotia, from 1969-1971. In 1971 she moved to the Florida State Museum in Gainesville, Florida. During this period she undertook an exhaustive study of zooplankton populations at Station 'S' with Albert Brooks of the Naval Underwater Systems Laboratory. The results were published in several parts.

In the first part (1971) Georgiana considered animals in the upper 500m collected twice monthly from March 1961 to April 1962. Here she returned to the comprehensive pattern of her earlier works of the western Atlantic coastal zone, analyzing the entire zooplankton fauna in detail. She measured displacement volumes and dry weights of the quantitative samples, and counted animals from aliquots of the samples. Copepods dominated the fauna; Georgiana identified 153 species from the 0-500m samples, and made counts on 116 species. She presented information about seasonal abundance of copepods as a group, calanoids vs cyclopoids, and numerous genera and species.

Georgiana published a second paper, with Albert Brooks, in 1971 in the "G. Evelyn Hutchinson Celebratory Issue of Limnology and Oceanography". Here they considered the fauna of plankton samples collected over four depths, 0-500m, 500-1000m, 1000-1500m, and 1500-2000m, each month from July 1968 to June 1969. They noted that copepods increased dominance and decreased total numbers with depth, as expected. They discussed the prevalence of nine calanoid genera both seasonally and with depth, along with

seasonal changes of three cyclopoids and one mormonilloid.

Georgiana published the final analysis of animals collected at Station 'S' with Albert Brooks in 1977. This analysis included samples taken through September 1970, and was restricted to the copepod fauna. They discussed quantitative changes, both vertically and seasonally, of total copepods and calanoids, and provided an extensive, although not exhaustive, list of 326 species with depth ranges. Seasonal variation in numbers were documented for many common genera of calanoids and cyclopoids, including five species of Metridia, M. brevicauda, M. venusta, M. curti-cauda, M. lucens, and M. discreta.

Georgiana published taxonomic reports on four calanoid genera, Temoropia, Paraugaptilus, Bathypontia, and Chiridiella, from these Sargasso Sea collections. She described the following new species: Temoropia minor in 1972; Paraugaptilus bermudensis in 1973a; Bathypontia intermedia in 1973b; Chiridiella brooksi, C. bichela, C. trihamata, C. kuniae, C. gibba, and C. ovata in 1974. She extended her studies of Bathypontia into the Gulf of Mexico and Caribbean Sea, describing Bathypontia unispina and B. miche-lae in 1979.

Georgiana's last paper on copepods, written with her husband, Ed, and Mark Brenner (1980), reflected her long-standing interest in the freshwater plankton fauna of Central America. Here again she emphasized vertical and seasonal distributions of major groups, Diaptomus and the cyclopoids.

Georgiana Baxter Deevey died on January 9, 1982. She left behind a number of studies in progress. Copepodologists will certainly miss the results of her survey of the zooplankton of Florida's freshwater lakes. The excellent quality of her work is easily recognized in her publications and reflected in the support she received from many organizations including the National Science Foundation, Atomic Energy Commission, The United States Navy, and universities, laboratories and museums throughout the world. Her readers continue to find the breadth of Georgiana's interests in copepods stimulating and challenging. She has provided all of us a solid foundation from which to pursue our work on the biology of copepods.

Submitted by Frank D. Ferrari with special thanks to Edward S. Deevey, Jr.

The l e t t e r b o x

A propos du plus ancien Copépode figuré
par Th. Monod

La note de R. Cressey (*MONOCULUS* Nr. 4: 9-10) m'incite à reprendre l'histoire de la Brachiella thynni.

1. C'est Aristote (H.A., V, 31 et VIII, 19) qui parle le premier de l'oestre qui parasite les thons et les espadons autour des nageoires et les pique si douloureusement, comme un scorpion qu'ils bondissent hors de l'eau.

Il s'agit sans doute pour le thon de Brachiella thynni Cuvier 1830 (D'Arcy W. Thompson, A glossary of greek fishes, 1947: 88), pour l'espadon de Penella filosa (Linné 1758).⁽¹⁾

2. Athénée, Deipnos., VII, 64 (302 b-c) répète et paraphrase Aristote, de même qu'Oppien, Halieut., II, 506-32 (trad. Limes 1817: 112) et Plinie, H.N., IX, 21; Salviani, Aquat. Animal. Hist., 1554, ff. 126 r°, n'ajoute rien à ses prédécesseurs.

Rondelet, par contre, a vu le parasite du thon et en donne une description et 2 figures (*Libri di Piscibus Marinis...*, 1554, chap. De Orcyno, p. 249; et *Universae aquatiliu Historiae pars altera...*, 1555, chap. De Oestro siue Asilo, p. 112-114). La figure de 1554 montre le Copépode fixé au-dessus de la pectorale d'un thon, celle de 1555 (p. 112) représente le parasite isolé, avec 6 processus postérieurs, les 2 sacs ovigères ayant été confondus avec ces derniers. Rondelet reproduira figures et description dans l'édition française (*La première partie de l'histoire entière des Poissons ...*, 1558, p. 198; et dans la seconde partie ..., 1558, p. 78-79).

Le Copépode est décrit ainsi: "Le Tahon marin a la figure d'un scorpion, de la grandeur d'une Araignée ... Au lieu de bouche, il ha un petit tuiau longuet selon le corps, de costé é d'autre i a comme deux mains qui se tournent vers la bouche, s'ensuit le creux du corps avec des decoupeures, au bout duquel sont six

(1) Dans une recherche des plus anciens Copépodes connus et décrits, il serait peut-être utile de dépouiller la littérature baleinière arctique: des Penelles ont pu être remarquées très tôt.

pieds, les deux qui sont tout au bout du creux du corps sont les plus gros é les plus longs, les deux suivans un deçà un delà, un peu moindres, les deux autres qui sont plus à costé sont les plus petits de tous. Du tuiau de la bouche il est semblable à la queue du Scorpion, des pieds aux pieds d'icelui, du creux du corps é de la grãdeur à une Araignée. Du bout rond de son tuiau qu'il ha pour bouche, il tient contre la plus molle, é plus grasse partie de dessous la pinne, si fort qu'on ne l'en sauroit arracher entier".

Il est vraisemblable que Rondelet a décrit l'oestre du thon mentionné par Aristote et la figure qu'il en donne (1555, p. 112 et 1558, II, p. 78) sera reproduite par Brian en 1906 (Copepodì parassiti dei Pesci d'Italia, pl. XIX, fig. 6), avec une figure en couleur de la ♀ de Brachiella thynni (pl. IX, fig. 1).

4, Gesner reproduira à plusieurs reprises les deux dessins de Rondelet, dans, par exemple: 1° Nomencl. Aquat. Animal., Icon. Animal. Aquat. in Mar. et Dulcib. Aquat...., 1560, le thon parasité (p. 111) et l'Oestrus vel Asilus marinus (p. 269) - 2° Hist. Animal. Lib. IV qui est de Piscium... 1604, mêmes figures p. 191 et 97 - 3° Nomencl. Aquat. Animal., Icones Animal. Aquat. in Mar. et Dulcib. Aquat...., 1606, mêmes figures, p. 111 et 269.

5. Cuvier figure, mais ne cite ni ne décrit, en 1817 ("Règne Animal", 4: pl. XV, fig. 5) le Brachiella thynni sans que ce nom soit mentionné, la légende ne parlant que de "divers Chondracanthes"; Shiino (Rept. Fac. Fish., Prefect. Univ. Mie, 2 No. 2, 1956: 283) cite le "Règne Animal", 1017: 287 et la planche "after Brian": or il n'est pas question du Brachielle en 1817 et Brian date de ... 1906.

En 1830 ("Règne Animal", 2e éd., III: 257, note 4) Cuvier crée en français, "Les Brachielles" et en note, le binom Brachiella thynni.

On peut donc conclure que: 1° le plus ancien Copépode observé l'a été par Aristote - 2° la figure la plus ancienne est celle publiée par Rondelet en 1554 - 3° le basionyme de Brachiella thynni date de 1830 (et non de 1817).

6. Steenstrup & Lütken (Kgl. Danske Vid.Selsk.Skrift, Naturhist.

Math. Afd., V, 2, 1861, p. 420-422, pl. XV, fig. 36) ont, à leur tour, résumé l'histoire de l'espèce en citant correctement pour Rondelet, l'édition latine (1554), antérieure au texte français (1558).

Can copepodologists agree on terminology of body form?

A letter reached us signed by C.J. Corkett and A.F. Campaner who have the following problem:

Recently we met in São Paulo University where we discussed the absence of agreement on copepod terminology (particularly on the body form) and wondered if copepodologists might be able to come to a consensus on terminology via the MONOCULUS newsletter.

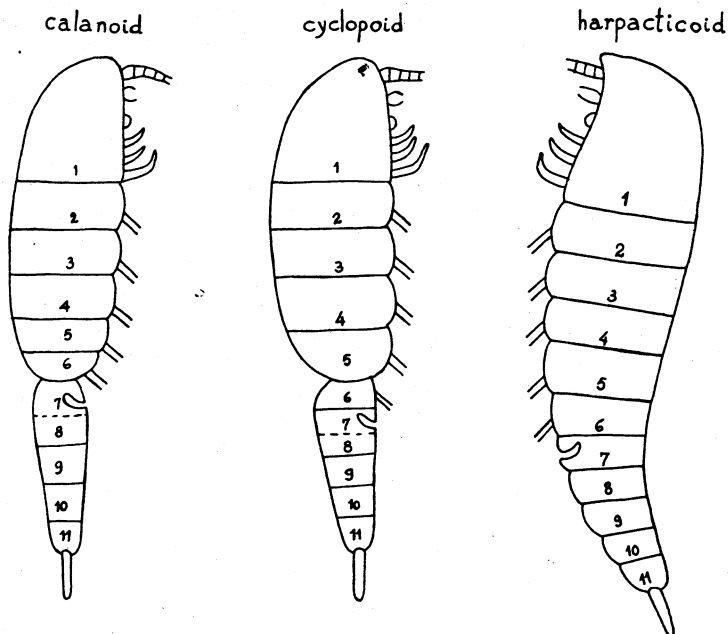
We therefore include a general outline of 3 body types (calanoid, cyclopoid and harpacticoid) together with labels and ask you to reproduce this in the next MONOCULUS newsletter. The idea is that readers should reproduce similar diagrams that are appropriately labelled and return to Dr. Corkett, who will see if there is some consensus.

It would be particularly useful if specialists on parasitic and commensal copepods could add drawings of similar generalized labelled body forms. If there is enough interest we could probably discuss this problem at the next copepod meeting in Ottawa.

This letter was sent to a few other people and a first reaction has already reached us. J. Carel von Vaupel Klein from Leiden sent us a copy of his letter to Christopher Corkett:

This is a reaction on your letter to Dr. Schminke... I agree that it is an urgent need to reach a consensus about morphological terminology in copepods and I hope we can solve this problem via the MONOCULUS Newsletter. Please find enclosed my standpoint as indicated. I also added a few terms which I think should be included and I have sent a copy of this also to Dr. Schminke, so that he may possibly insert these terms in the definite version of the call in MONOCULUS.

On the next page you find the general outline of the body form of a calanoid, a cyclopoid and a harpacticoid copepod.



Where would you put these labels on the body? Please also give definitions where appropriate.

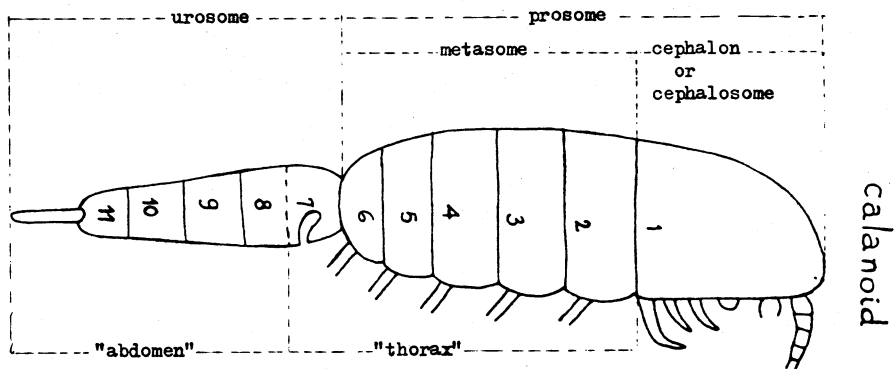
somites	urosome	antenna
segments	head	mandible
joints	thorax	1st maxilla
articles	abdomen	2nd maxilla
cephalon	caudal rami	maxilla
cephalosome	uropod	maxillule
cephalothorax	furca	maxilliped
prosome	2nd antenna	(swimming) legs
metasome	1st antenna	pleopods
mesosome	antennule	other

Please copy or reproduce similar diagrams with your interpretation and appropriate labelling and send your answer to Dr. C. J. Corkett, Biology Department, Dalhousie University, Halifax, Nova Scotia, Canada B3H 3J5. The results will be compiled for a consensus to be reproduced in the newsletter at a later date.

Reply of J. C. von Vaupel Klein applying to the Calanoida only:

Terms I prefer are underlined. I agree that morphological terminology is rather messy. Yet, I hesitate to establish a uniform terminology, since true homologies have not yet been established. This, however, may well take several decades to come, and should be founded on copepod c.q. crustacean phylogeny.

- somite = any true body segment (metamere) thus excluding acron and telson; or a combination of body segments, if properly specified (e.g. genital somite).
- acron = the (embryological) presomital, non-segmented part of the body.
- telson = "anal operculum" auct.; the non-segmented post-somital body region.
- cephalon = head, anterior part of the body, including the mxp-somite. (Perhaps the term should be replaced by cephalosome?)
- head = see cephalon; according to Manton (1977: The Arthropoda ... etc.) there is no clearly demarcated head in crustaceans.
- cephalosome = cephalon plus one or more pedigerous somites if these are completely fused to the cephalon. However, in my opinion this term is redundant and should be avoided, or it should be used to replace the term cephalon.
- cephalothorax = prosome; since cephalothorax has been used in a variety of meanings, I think it should be avoided.
- prosome = the complete body section anterior to the major articulation, to be divided into cephalon and metasome.
- metasome = pedigerous somites between cephalon and major articulation of the body.



<u>mesosome</u>	= term should not be used
<u>urosome</u>	= the complete body section posteriad to the major body articulation, so = abdomen + the thoracic somite incorporated in the genital complex.
thorax	= not satisfactorily defined body region; term should not be used.
abdomen	= ditto as thorax
cephalic somite	= cephalon; term should not be used.
thoracic somite	= since the distinctness of head, thorax and abdomen is questioned, the term should not be used.
<u>pedigerous somite</u>	= somites bearing the natatory legs 1-5.
<u>genital somite</u>	= genital double-somite = genital complex; since the composite nature of the Gnsom is well known, this term is not confusing.
<u>furca</u>	= pair of uropods; term is purely descriptive, so not confusing.
caudal rami	= furcal rami; neither term should be used.
<u>uropods</u>	= furcal rami; I agree with Bowman (1971) that the rami are uropods.
<u>segment</u>	= any original, articulating part of an appendage; should not be used as a synonym of somite.
joint	= only the hinge-joint proper, the articulation itself; should not be used as a synonym of segment.
article	= though often used as a synonym of segment, in my opinion this term should not be used.
<u>frontal organ</u>	= pair of semi-tubular outgrowth with hairs (frontal sensilla) + frontal pore.
<u>rostrum</u>	= rostrum; term is alright.
1st antenna	= antennule; should not be used.
<u>antennule</u> or <u>antennula</u>	= preferred synonym for 1st antenna.
2nd antenna	= antenna; should not be used.
<u>antenna</u>	= preferred synonym for 2nd antenna.
<u>mandible</u>	= term is alright.
<u>maxillula</u>	= preferred term; 1st maxilla or maxilla should not be used.
<u>maxilla</u>	= preferred term; 2nd maxilla or 1st maxilliped should not be used.
<u>maxilliped</u> or <u>maxillipes</u>	= preferred term; 2nd maxilliped should not be used.
<u>legs</u>	= swimming legs = natatory legs; foot should not be used.

pleopods	= ? never found a pleopod on a copepod.
<u>genital field</u>	= vulva + genital operculum, situated on genital proeminence.
<u>genital operculum</u>	= preferred but rather equivalent term for genital valve(s), genital plate, genital aperture.
genital antrum	= vulva
<u>vulva</u>	= genital cavity underlying the genital operculum.
<u>anus</u>	= anal opening
<u>oral opening</u>	= oral atrium, oral cavity, mouth, etc.
<u>labrum</u>	= upper lip
<u>labium</u>	= lower lip = pair of paragnaths.
<u>basipodite</u>	= term allright
protopodite	= basipodite, but term should not be used.
* <u>endopodite</u>	= term allright
* <u>exopodite</u>	= term allright
precoxa	= not to be used
coxa	= not to be used
basis	= not to be used

* (Perhaps it is better to refer to the rami of the appendages rather as "ramus 1" and "ramus 2" until true homologies have been established.)

This is the beginning of the MONOCULUS-Glossary the aim of which will be to compile a list of all terms and their exact definitions actually used in copepod morphology. The terms mentioned above are rather general ones and all answers in this respect should be addressed to Christopher Corkett but *MONOCULUS* would welcome copies of these letters.

In addition to that there are a lot of more specific terms which apply to particular groups and species only. If we want to register these terms as well it will be necessary that as many specialists as possible send lists to Kurt Schminke of all the terms that for them are daily practice. This is the only way that will enable us to compile a comprehensive list without serious omissions.

The idea of a *MONOCULUS-Glossary* was brought up by Jan H. Stock on our meeting in Frankfurt when preparing the First International Conference on Copepoda. We are glad that now the occasion arises to put this idea into practice.

Finally there is a letter by R. Hamond, Department of Zoology, University of Melbourne, Parkville, Victoria 3052, Australia: Monk (1941) published a short account of some species of harpacticoids found by him on the coast of California, since when his specimens have disappeared; his work was referred to by Lang (1965), and I have also found what I think are some of Monk's species in samples collected for me in the same general area.

May I use the courtesy of your columns to ask any reader, who might know the present whereabouts of any of Monk's slides or preserved specimens, to contact me as soon as possible? Dr. Monk himself is doing all he can to find them in the place or places where he is most likely to have put them; but after the lapse of about forty years it is not at all unlikely that at least some of them may have strayed elsewhere, and I am most anxious to find them and have them properly designated as type material of the species that they represent.

References:

- C.R. Monk - 1941: Marine harpacticoid copepods from California. Trans. Amer. microsc. Soc. 60: 75-99
K. Lang - 1965: Copepoda Harpacticoida from the Californian Pacific coast. Kungl. Svensk. Vetensk. Akad. Handl. (4) 10(2): 1-560

How can help?

..terature-literature-literature-literature-litera..

1980

CHANDRAN, A. & N. BALAKRISHNAN - 1980: The unusual occurrence of the male of Pseudocharopinus narcinae on the gill filaments of Narcine timlei. Curr. Sci. 49: 837-838

GANNON, J.E. - 1980: Towards improving the use of zooplankton in water quality surveillance of the St. Lawrence Great Lakes. Proc. First Biol. Surveillance Symp., 22nd Conference on Great Lakes Research, Rochester, New York, 1979. Can. Tech. Rep. Fish. Aquat. Sci. 976: 87-109

1981

ARNOTT, G.H. & A.D. MCKINNON - 1981: Kelleria corioensis, a new lichomolgid (Copepoda: Cyclopoida) from Corio Bay, Australia,

- with comments on K. australiensis Bayly, 1971. J.Crust.Biol. 1(2): 279-287
- ARCOS, F. - 1981: A dense patch of Arcatia levequei (Copepoda, Calanoida) in upwelled equatorial undercurrent water around the Galapagos Islands. In: RICHARDS, F.A. (ed.), Coastal and Estuarine Sciences 1, Coastal Upwelling, American Geophysical Union, Washington 1981: 427-432
- BARETTA, J.W. - 1981: The zooplankton of the Ems estuary: quantitative data. In: WOLFF, W.J. et al. (eds.), Invertebrates of the Wadden Sea, Rep. 4 of the Wadden Sea Working Group, 1981: 145-153
- BOUWMAN, L.A. - 1981: The meiofauna of the Ems estuary. Ibid.: 153-157
- BRENNING, U. - 1981: Beiträge zur Calanoidenfauna (Crustacea, Copepoda) vor Nordwest- und Südwestafrika. I. Die Vertreter der Familie Calanidae. Wiss.Z.Univ.Rostock, Math.-nat. Reihe, 30(4/5): 1-12
- BRENNING, U. - 1981: Beiträge zur Calanoidenfauna (Crustacea, Copepoda) vor Nordwest- und Südwestafrika. II. Die Vertreter der Familie Eucalanidae. Ibid. 30(4/5): 13-21
- CONNELL, A.D. - 1981: The taxonomy and distribution of some calanoid copepods in South African east coast estuaries. Ann. Natal Mus. 24(2): 489-500
- DO, T.T. - 1981: Parasitic Copepoda Diergasilus kasaharai gen. et sp. nov. from the striped mullet Mugil cephalus. Bull.Jap. Soc.Sci.Fish. 47(6): 735-740
- ELGMORK, K. - 1981: Extraordinary prolongation of the life cycle in a freshwater planktonic copepod. Holarct.Ecol. 4: 278-290
- EVANS, F. - 1981: An investigation into the relationship of sea temperature and food supply to the size of the planktonic copepod Temora longicornis Müller in the North Sea. Estuarine, Coastal and shelf Science 13: 145-158
- FERRARI, F. - 1981: Oithona wellershausi, new species, and O. spinulosa Lindberg, 1950 (Copepoda: Cyclopoida: Oithonidae) from the mouth of the Pearl River, China. Proc.Biol.Soc. Washington 94(4): 1244-1257
- GANNON, J.E. - 1981: Changes in zooplankton populations in Lakes Erie and Ontario. Buffalo Soc.Nat.Sci. 25(4): 21-40
- GANNON, J.E. - 1981: Zooplankton of the North American Great Lakes. Verh.Internat.Verein.Limnol. 21: 1725-1735
- GOPHEN, M. 1981: The metabolism of adult Mesocyclops leuckarti populations in Lake Kinneret (Israel) during 1969-1978. Ibid. 21: 1568-1572
- GYLLENBERG, G. - 1981: Ingestion and turnover of oil and petroleum hydrocarbons by two planktonic copepods in the Gulf of Finland. Ann.Zool.Fennici 18: 225-228

- GYLLENBERG, G. - 1981: Eudiaptomus gracilis (Copepoda, Calanoida): diel vertical migration in the field and diel oxygen consumption rhythm in the laboratory. *Ann.Zool.Fennici* 18: 229-232
- JONES, J.B. - 1981: Abergasilus amplexus Hewitt, 1978 (Ergasilidae: Copepoda) from New Zealand, with a description of the male. *N.Z.J.Mar.Freshw.Res.* 15: 275-278
- JONES, J.B. & A.A. MONTEZ MORENO - 1981: Lonchidiopsis setosus n.sp. (Copepoda: Notodelphyidae) from Venezuela. *Syst.Parasitol.* 3: 53-57
- KABATA, Z. - 1981: Copepoda (Crustacea) parasitic on fishes: problems and perspectives. *Advances in Parasitology* 19: 1-71
- KABATA, Z. - 1981: Relegation of Hatschekia acuta Barnard, 1948, to synonymy with Hatschekia conifera Yamaguti, 1939 (Copepoda: Siphonostomatoida). *Can.J.Zool.* 59: 2080-2084
- KABATA, Z. - 1981: Crucisoma bernardi n.g., n.sp. (Crustacea: Copepoda) parasitic in a deep-sea mollusc Cuspidaria filatovae Bernard, 1979 (Bivalvia: Anomalodesmata). *Syst.Parasitol.* 3: 91-95
- KABATA, Z. & J.-S HO - 1981: The origin and dispersal of hake (genus Merluccius: Pisces: Teleostei) as indicated by its copepod parasites. *Oceanogr.Mar.Biol. Ann. Rev.* 19: 381-404
- KABATA, Z. & I.U. TAREEN - 1981: A new species of Thysanote Krøyer, 1863 (Copepoda, Lernaeopodidae) from the Persian Gulf, with comments on the genus. *Syst.Parasitol.* 3: 97-103
- KAHAN, D. - 1981: Effect of some ecological factors on the growth of the copepod Schizopera elatensis - a potential food organism for hatcheries. *Kieler Meeresforsch., Sonderh.* 5: 544-553
- KAHAN, D. & M. AZOURY - 1981: Laboratory cultivation of Nitocra spinipes Boeck from the solar pond (Gulf of Aqaba - Red Sea). *Europ.Maricult.Soc., Spec. Publ.*, 6: 117-131
- KIEFER, F. - 1981: Beitrag zur Kenntnis von Morphologie, Taxonomie und geographischer Verbreitung von Mesocyclops leuckarti auctorum. *Arch.Hydrobiol./Suppl.* 62(1): 148-190
- KIEFER, F. - 1981: Ein neuer brunnenbewohnender Cyclopide (Copepoda, Cyclopoida) aus Syrien. *Andrias* 1: 101-102
- McALICE, B.J. - 1981: On the post-glacial history of Acartia tonsa (Copepoda: Calanoida) in the Gulf of Maine and the Gulf of St. Lawrence. *Mar.Biol.* 64: 267-272
- MONNIOT, C. - 1981: Description de Copépodes ascidicoles (Notodelphyidae et Ascidicolidae) de la pente continentale du golfe de Gascogne. *Bull.Mus.natn.Hist.nat., Paris, 4e sér., (A)* 3 (2): 431-454
- RANGA REDDY, Y. & P.K. DAS - 1981: A redescription of Neodiaptomus satanas Brehm, 1952 (Copepoda, Calanoida) with critical comments on its present taxonomic status. *Crustaceana*

41(1): 1-9

- RANGA REDDY, Y & Y RADHAKRISHNA - 1981: On the genus Heliodiaptomus Kiefer in India, including the description of a new species (Copepoda, Calanoida). *Hydrobiologia* 83: 161-172
- RIPPINGALE, R.J. - 1981: The ecology of plankton fauna in saline river pools. *Hydrobiologia* 82: 223-231
- ROBERTSON, A. & J.E. GANNON - 1981: Annotated checklist of the free-living copepods of the Great Lakes. *J.Great Lakes Res.* 7(4): 382-393
- SCHNACK, S.B. & M ELBRÄCHTER - 1981: On the food of calanoid copepods from the northwest African upwelling region. In: RICHARDS, F.A. (ed.), *Coastal and Estuarine Sciences 1, Coastal Upwelling*, American Geophysical Union, Washington 1981: 433-439
- SHIH, C.-T. & D.C. MACLELLAN - 1981: Aetideopsis albatrossae, new species (Crustacea: Copepoda) from east of Mindoro, The Philippines. *J.Crust.Biol.* 1(4): 567-572
- WALKER, L.M. - 1981: Reproductive biology and development of a marine harpacticoid copepod reared in the laboratory. *J.Crust. Biol.* 1(3): 376-388
- WILLEMS, K.A. - 1981: Boreopontia heipi n.g., n.sp. an interstitial harpacticoid (Copepoda) from the southern bight of the North Sea. *Biol.Jb.Dodonea* 49: 200-209

1982

- BOXSHALL, G.A. - 1982: On the anatomy of the misophrioid copepods, with special reference to Benthomiosiphria palliata Sars. *Phil.Trans.R.Soc.London (B)* 297: 125-181
- BURKILL, P.H. & T.F. KENDALL - 1982: Production of the copepod Eurytemora affinis in the Bristol Channel. *Mar.Ecol.Prog.Ser.* 7: 21-31
- DAMKAER, D.M. - 1982: Possible influences of solar UV radiation in the evolution of marine zooplankton. In: CALKINS, J. (ed.), The role of solar ultraviolet radiation in marine ecosystems, Plenum Publishing Corporation, New York, 1982: 701-706
- DAMKAER, D.M. & D.B. DEY - 1982: Nomograms for biologically effective UV. *Ibid.*: 205-211
- DAMKAER, D.M. & D.B. DEY - 1982: Short-term responses of some planktonic Crustacea exposed to enhanced UV-B radiation. *Ibid.* 417-427
- DO, T.T. & S. KASAHARA - 1982: Humphreysia hoi sp. nov. (Copepoda: Poecilostomatoida, Chondracanthidae) parasitic on the gills of Parapercis sexfasciata (Temminck & Schlegel) (Pisces: Teleostei, Parapercidae) with description of first male of the ge-

nus. Fish Pathology 16(4): 157-162

DOJIRI, M. & A.G. HUMES - 1982: Copepods (Poecilostomatoida: Taeniacanthidae) from sea urchins (Echinoides) in the southwest Pacific. Zool.J.Linn.Soc. 74(4): 381-436

DRENNER, R.W., G.L. VINYARD, M. GOPHEN & S.R. McCOMAS - 1982: Feeding behaviour of the cichlid, Sarotherodon galileum: selective predation on Lake Kinneret zooplankton. Hydrobiologia 87: 17-20

ELMORE, J.L. - 1982: The influence of food concentration and container volume on life history parameters of Diaptomus dorsalis Marsh from subtropical Florida. Hydrobiologia 89: 215-223

GARDNER, G.A. - 1982: Patterns in the distribution and abundance of selected zooplankton species from the coast of British Columbia. Biol. Oceanogr. 1(3): 255-270

GARDNER, G.A. - 1982: Biological and hydrographical evidence of Pacific equatorial water on the continental shelf north of Vancouver Island, British Columbia. Can.J.Fish.Aquat.Sci. 39(5): 660-667

HO, J.-S. - 1982: Copepoda associated with echinoderms of the Sea of Japan. Ann.Rep.Sado Mar.Biol.Stat., Niigata Univ. 12: 33-61

HO, J.S. & T.T. DO - 1982: Two species of Ergasilidae (Copepoda: Poecilostomatoida) parasitic on the gills of Mugil cephalus Linnaeus (Pisces: Teleostei), with proposition of a new genus Dermoergasilus. Hydrobiologia 89: 247-252

ITO, T. - 1982: Diosaccus sp. aff. dentatus (Thompson et A. Scott) (Copepoda, Harpacticoida) from Bactan Isl., the Philippines. Publ.Seto Mar.Biol.Lab. 27 (1/3): 165-171

ITO, T. - 1982: Harpacticoid copepods from the Pacific abyssal off Mindanao. I. Cerviniidae. J.Fac.Sci.Hokkaido Univ. (6) 23 (1): 63-127

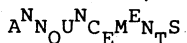
KAHAN, D., G. UHLIG, D. SCHWENZER & L. HOROWITZ - 1982: A simple method for cultivating harpacticoid copepods and offering them to fish larvae. Aquaculture 26: 303-310

KLEIN BRETELER, W.C.M. - 1982: The life stages of four pelagic copepods (Copepoda: Calanoida), illustrated by a series of photographs. Netherland Institute for Sea Research Publication Series 6: 1-32

MALT, S.J. - 1982: New and little known species of Oncaeidae (Cyclopoida) from the northeastern Atlantic. Bull.Br.Mus.nat.Hist. (Zool.) 42(3): 185-205

MALT, S.J. - 1982: Developmental stages of Oncaea media Giesbrecht, 1891 and Oncaea subtilis Giesbrecht, 1892. Bull.Br. Mus.nat.Hist. (Zool.) 43(3): 129-151

- McALICE, B.J. & G.B. JAEGER - 1982: Seasonality of Monstrilla helgolandica Claus, 1863 (Copepoda, Monstrilloidea) and the occurrences of other monstrillids in Maine. J. Crust.Biol. 2(1): 45-47
- MIELKE, W. - 1982: Interstitielle Fauna von Galapagos XXIX Darcythompsoniidae, Cyliropsyllidae (Harpacticoida). Akad. Wiss.Lit.Mainz, Math.-nat.Kl., Mikrofauna Meeresboden 87: 1-50
- MONNIOT, C. - 1982: Paulillgia polycarpae n.g., n.sp., copépode parasite d'un Polycarpa (Ascidacea) de la pente du plateau continental du Golfe de Gascogne. Crustaceana 43(1): 21-24
- RANGA REDDY, Y & Y. RADHAKRISHNA - 1982: Redescription and/or remarks on four species of Pseudodiaptomus Herrick (Copepoda: Calanoida) from South India. Hydrobiologia 87: 255-271
- SHIH, C.-T. & N. STALLARD - 1982: Notes on two deep-water calanoids (Aetideopsis rostrata and Neoscolecithrix farrani) from Lancaster Sound. Arctic 35(1): 56-60
- SCHMINKE, H.K. - 1982: Die Nauplius-Stadien von Parastenocaris vicesima Klie, 1935 (Copepoda, Parastenocarididae). Drosera '82(1): 101-108
- SCHNACK, S.B. - 1982: The structure of the mouth parts of copepods in Kiel Bay. Kieler Meeresforsch. 29: 89-101
- SCHRIEVER, G. - 1982: Neue Harpacticoida aus dem Nordatlantik (Crustacea, Copepoda). I. Thieliella nov.gen. (Familie Ancorabolidae). "Meteor"-Forsch.-Ergen. (D) 35: 21-26
- SCHRIEVER, G. - 1982: Neue Harpacticoida aus dem Nordatlantik (Crustacea, Copepoda). II. Vier neue Arten der Familien Diosaccidae und Ameiridae. "Meteor"-Forsch.-Ergebn.(D) 35: 27-34
- SUTHERLAND, I. - 1982: A collection of zooplankton from Tuktoyaktuk Harbour, Northwest Territories. Can.J.Zool. 60(3): 477-480
- WELLS, J.B.J., G.R.F. HICKS & B.C. COULL - 1982: Common harpacticoid copepods from New Zealand harbours and estuaries. N.Z. J.Zool. 9: 151-184



A special session of contributed papers on "Origins and Distributions of Caribbean-Gulf of Mexico Crustacean Fauna" will be co-sponsored by The Crustacean Society during the 44th Annual Meeting of the Association of Southeastern Biologists in Lafayette, Louisiana. The session will be scheduled during the April 13-16, 1983, which will be headquartered in the USL Conference Center on the campus of the University of Southwestern Louisiana. It is anticipated that the session will include papers dealing with a broad array of

crustacean groups from marine and estuarine waters or freshwater and terrestrial habitats of coastal plains, drainage basins, and islands in the region. Topics will deal with relationships of distributions to geography, parent stocks, substrates, currents, host availability, season, water quality, or other physiographic factors. Further information, registration forms, and housing application forms may be requested from Dr. Darryl L. Felder, Department of Biology, Box 42451, University of Southwestern Louisiana, Lafayette, LA 70504 (Tel. 318/231-6753).

-.-.-.-..

American Society of Zoologists Symposium on "Frontiers in Crustacean Endocrinology". December 26-30, 1983 in Philadelphia, USA. Organized by Thomas C. Jegla for the Division of Comparative Endocrinology (co-sponsored by the Division of Comparative Physiology and Biochemistry, AZS, and Crustacean Society).

List of speakers with tentative titles:

Thomas C. Jegla Kenyon College and Yale University	Introduction
Hugo Aréchiga I.P.N., Mexico City	The neurodepression hormone and control of activity
Ernest M. Chang University of California, Bodega Bay Marine Lab.	Physiological control of molting
Hélène Charniaux-Cotton University of Paris	Hormonal control of sex and reproduction
Ian M. Cooke University of Hawaii	Neurosecretion and control of neurosecretory products
Milton Fingerman Tulane University	Physiology and pharmacology of chromatophores
Lars Josefsson University of Copenhagen	Biochemistry of pigmentary effectors
Rainer Keller University of Bonn	The hyperglycemic hormone (HGH)
Linda Mantel City College, New York	Control of water and ion balance
John D. O'Conner University of California Los Angeles	Biochemistry of the molting hormones
Dieter Sedlmeier University of Bonn	Mechanisms of HGH action
Klaus-Dieter Spindler University of Düsseldorf	Molting hormone receptors

FIRST ANNOUNCEMENT
of the Second International Conference on Copepoda

The Organizing Committee is pleased to announce that the Second International Conference on Copepoda will be held in Ottawa, Canada from August 13 to 17, 1984. Chang-tai Shih, the local member of the Committee, and Ian Sutherland will carry out local coordination.

The Second Conference will sponsor four symposia and a panel discussion. The Organizing Committee is delighted that the following copepodologists have agreed to chair these sessions:

Panel Discussion on Copepoda Phylogeny	Dr. Zbigniew Kabata
Biogeography of Copepoda	Dr. Ju-shey Ho
Behavioural Ecology	Dr. Brian Marcotte
Growth, Life History and Culture	Dr. Christopher Corkett
Morphology and Anatomy	Dr. Carel von Vaupel-Klein

These chairpersons will be responsible for inviting speakers and setting up the format for their respective session.

There will be five half-day sessions of contributed papers. In principle, the Committee prefers to have single sessions but may consider running concurrent sessions of contributed papers if necessary. The poster session will be expanded to accommodate more presentations. Poster papers, if properly presented, may provide effective and intimate exchanges between authors and participants.

Forms and instructions will be available in the summer of 1983. Deadline for submission of abstract is December 31, 1983. Abstracts of posters and contributed papers will be printed before the Conference. All manuscripts, including contributed, poster, and symposium papers, will be published in the Proceedings of the Conference if the manuscripts is submitted to the Committee before the end of the Conference.

Estimated costs: Registration fees, \$ 100 - 120 (\$ 50 - 60 for students); accomodation (meals excluded) \$ 25 - 30 per day. All estimates are in Canadian currency. Each registered participant will receive a copy of the Proceedings (costs included in registration fees).

Pre- and post-conference excursions are under negotiation.

Persons interested in receiving future announcements and other informations about the Conference are asked to write to:

Ian Sutherland
National Museum of Natural Sciences
Invertebrate Zoology Division
Ottawa, Ontario
Canada, K1A 0M8

Second International Conference on Copepoda

Please send me further information on the Conference

Name:

Institution:

Mailing Address:

Telephone:

Area of research/interest:

Will you attend the Conference? Yes ____ . No ____ . Not sure ____ .

If yes, answer the following questions:

Will you present a paper? Yes ____ . No ____ . Not sure ____ .

If yes, give an approximate title if possible:

Will you present a poster? Yes ____ . No ____ . Not sure ____ .

If yes, give an approximate title if possible:

Will you be interested in organizing special evening group discussion?

Yes ____ . No ____ . Not sure ____ .

If yes, give an approximate topic of the discussion:

Comments:

Please return this form before 31 December 1982 to:

Dr. C. T. Shih
National Museum of Natural Sciences
Invertebrate Zoology Division
Ottawa Ontario
Canada K1A 0M8

DIRECTORY OF COPEPODOLOGISTS

BURCHSTED, FREDERIC F.

University of Texas at Austin
Texas Memorial Museum
2400 Trinity
Austin, Texas 78705

USA

(Natural history of freshwater copepods, small ponds, wetlands and the littoral zone.)

CHAPARRO, OSCAR

Centro de
Investigaciones Marinas
Universidad Austral de Chile
Casilla 567
Valdivia

CHILE

(Planktonic copepods.)

COHEN, ROSALIND E.

National Marine
Fisheries Service
Northeast Fisheries Center
Woods Hole Laboratory
Woods Hole, Mass. 02543

USA

(Zooplankton ecology, related to larval fish survival.)

COONEY, JOHN D.

Environmental Sciences Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

USA

COYLE, KENNETH O.

IMS
University of Alaska
Fairbanks, Alaska 99701

USA

(Crustacean systematics.)

DAMKAER, DAVID M.

(Dr.)

University of Washington
Oceanogr. WB-10
Seattle, WA 98195

USA

(Systematics of free-living Copepoda; history of the study of Copepoda.)

GEEN, GLEN H.

(Prof.)

Dept. of Biological Sciences
Simon Fraser University
Burnaby, B.C.

CANADA V5A 1S6

(Ecological energetics, environmental toxicity.)

GOSWAMI, USHA

(Dr.)

National Institute of
Oceanography
Dona Paula - 403 004
Goa

INDIA

(Cyto-taxonomy and genetics of Copepoda.)

GRAINGER, E. H.

(Dr.)

Arctic Biological Station
555 Blvd. St. Pierre
Ste. Anne de Bellevue
Québec

CANADA H9X 3R4

(Arctic marine plankton ecology.)

HIROMI, JURO

Department of Fisheries
Nihon University
Shimouma, Setagaya
Tokyo 154

JAPAN

(Taxonomy and ecology of marine copepods.)

- LE BRASSEUR, R.T. (Dr.)
Pacific Biological Station
Nanaimo, B.C.
CANADA V9R 5K6
(Biological oceanography.)
- PEARRE, SIFFORD (Dr.)
Department of Oceanography
Dalhousie University
Halifax, Nova Scotia
CANADA B3H 4J1
(Zooplankton ecology, vertical migration, feeding, food selection.)
- PECHEN-FINENKO, G.
Institute of Biology of
South Seas of the
Academy Nauk Of USSR
Sevastopol, 335000
USSR
(Bioenergetic of Copepoda.)
- POULET, S. A. (Dr.)
Station Biologique
Place Georges Teissier
F-29211 Roscoff
FRANCE
(Zooplankton ecology.)
- REID, JANET W. (Dr.)
NHB-163
Smithsonian Institution
Washington, D.C. 20560
USA
(Neotropical freshwater copepods, meiobenthos.)
- REIDENAUER, JEFFREY A.
Department of Oceanography
Florida State University
Tallahassee, Florida 32306
USA
(Harpacticoid taxonomy, meiofauna ecology.)
- ROFF, JOHN C. (Prof.)
Zoology Department
University of Guelph
Guelph, Ontario
CANADA N1G 2W1
(Community and production ecology of marine and freshwater plankton.)
- TAN, TIEN-SHI (Prof.)
Department of Zoology
National Taiwan University
Taipei
TAIWAN, R.O.C.
(Taxonomy and ecology of marine copepods.)
- WIEBE, PETER H.
Woods Hole
Oceanographic Institution
Woods Hole, Mass. 02543
USA
(Oceanic zooplankton ecology.)
- C h a n g e o f a d d r e s s
- McKINNON, DAVID
Department of Zoology
University of Melbourne
Parkville, Victoria 3052
AUSTRALIA
- MORIOKA, YASUHIRO (Dr.)
Seikai Regional Fisheries
Research Laboratory
Kokubu-cho
Nagasaki 850
JAPAN
- SCHNACK, SIGRID (Dr.)
Alfred-Wegener-Institut
für Polarforschung
Columbus Center
D-2850 Bremerhaven
FED. REP. GERMANY