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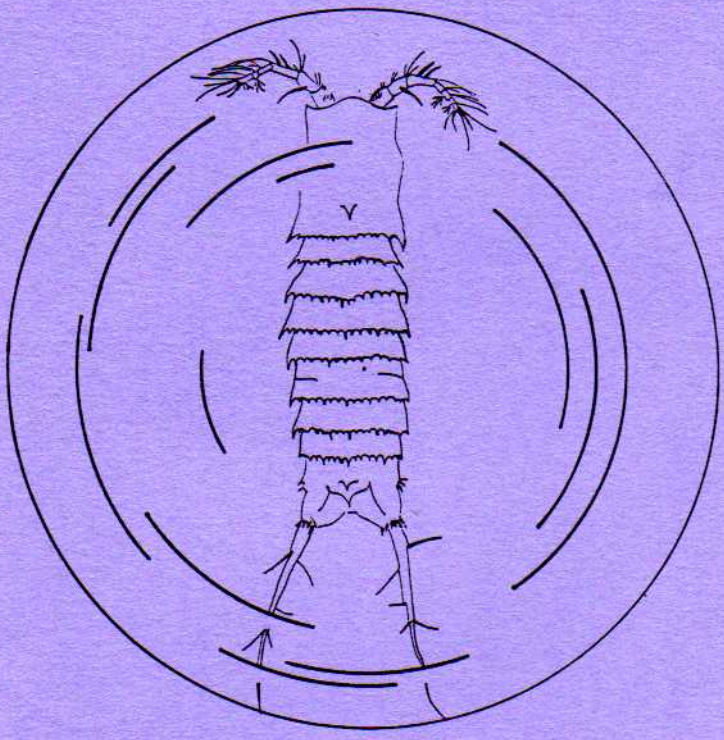
MONOCULUS

Copepod Newsletter



Nr. 18 **June 1989**

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MONOCULUS

Copepod Newsletter

Number 18 June 1989

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

Birthdays this year:

80: Emilia Stella

75: Paul L. Illg

70: W.J.P. Smyly

Torben Wolff

Died:

Bruno Scotto di Carlo

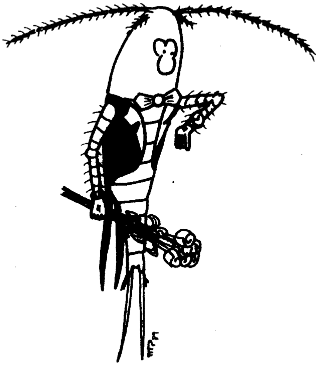
Deadline for the next issue of *MONOCULUS*: 1st October 1989

E d i t o r i a l

There are a few *MONOCULUS* addicts showing withdrawal symptoms already. They sent inquiries about when the next issue would be due. Never has the "spring" issue of the newsletter appeared so late, it is true, but we would probably have postponed it even longer if not our Fourth International Conference on Copepoda was to be held soon. Its organizers have important announcements to make and want the news to spread. There is a large group of copepodologists in Japan and we hope they will be joined by as many colleagues from all over the world when the conference starts in September next year.

The long announced interview with Emilia Stella finally appears. Woman science is a very popular issue in academic circles in Germany these days and Kurt thought (and announced) that he could make the interview to exemplify this. Re-reading his interview he found that he had given it a bias and wrong touch that distorts a much more interesting reality. So he produced a new version. The drawing usually accompanying our portraits has not reached us in time as hasn't that of Bruno Scotto di Carlo. Both drawings will be reproduced in the next issue.

We thank G. Boxshall, C. Corkett, H.-U. Dahms, A. Ianora, A. Joyce, H. Juhl, F.D. Por, J. Reid, S.-I. Uye for their contributions and Mark Pottek for garnishing them with funny drawings. We apologize for this late issue, but we hope you enjoy it all the same. Its delay is due to Kurt's sabbatical.



H. K. Schminke   G. Schminke

THE WORLD ASSOCIATION OF COPEPODOLOGISTS

WAC WAC ..... WAC WAC

1. Officers

The Officers of the WAC for the period 1987-1990 are as follows:

Prof. JAN HENDRIK STOCK
(President)
Taxonomische Zoologie
Universiteit van Amsterdam
Mauritskade 57
P.O. Box 4766
NL-1009 AT Amsterdam
The Netherlands

Prof. JOHN B.J. WELLS
(Vice-President)
Department of Zoology
Victoria University of
Wellington
Private Bag, Wellington
New Zealand

Dr. CHRIS J. CORKETT
(General Secretary)
Biology Department
Dalhousie University
Halifax, Nova Scotia
Canada B3H 4J1

Dr. GERD SCHRIEVER
(Treasurer)
Zoologisches Institut
Biologie-Zentrum
Universität Kiel
Olshausenstr. 40
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Dr. SHIN-ICHI UYE
(Local Secretary)
Faculty of Appl. Biol. Sci.
Hiroshima University
Saijo-cho
Higashi-Hiroshima 724
Japan

Executive Council

Dr. M. GOPHEN (Israel)
Prof. J.-S. HO (U.S.A.)
Prof. H.K. SCHMINKE (F.R.G.)
Dr. C.-T. SHIH (Canada)

2. Founder members

At the beginning of 1986 all members that were on the *MONOCULUS* mailing list turned into founder members (article 1 of the By-laws). A list of these founder members is given in *MONOCULUS* No. 14, pp. 3-4, April 1987. This was a "once only" event and it is not possible to others to now join the WAC as founder members.

3. Active and candidate members

Any person interested in any aspect of the study of Copepoda is eligible for membership of the WAC. Applicants for membership must be nominated by two active or founder members of the Association. Those who have completed this application process are known as candidate members. A list of candidate members will be presented by the Executive

Council to the membership during the business meeting of the WAC (the next business meeting is at the Fourth International Conference on Copepoda, Nihon University, Karuizawa, Japan, Sept. 16-20th, 1990). Candidate members who are ratified by the quorum of the business meeting become active members. A complete list of active members including some candidate members is given in *MONOCULUS* No. 17, November 1988, p.4. If you are interested in becoming a member of the WAC write to the Honorary Secretary (Chris Corkett) or the Local Secretary (Shin-ichi Uye) for application form and other information. See list of Officers for addresses.

4. Dues

The most recent information on dues with lists of paid-up and delinquent members is given in *MONOCULUS* 17, November 1988, p. 3. Dues are payable by founder and active members but not candidate members. You may ask the Executive Council to have your dues waived or reduced (Article 10 of the By-laws) by letting the President (Professor J.H. Stock, address above) know what these reasons are.

Dues are still at 7 US $ (or 13.00 DM) per annum. Europeans may send their personal eurocheques in German Marks. Americans and Canadians should send their personal cheques, while all the others should use international money orders or bank drafts in US $ and make them payable to the following account:

No. 7233190, Commerzbank Kiel,
mark "WAC, c/o Dr. G. Schriever".

Please note that Gerd has a new address:

Dr. Gerd Schriever
Zoologisches Institut
Biologie-Zentrum
Universität Kiel
Olshausenstr. 40
D-2300 Kiel 1
F.R. Germany

Those who want to pay by postal money order may use the following account:

No. 346508-303, Postgiroamt Hannover,
mark "WAC, c/o Dr. H.K. Schminke".

5. List of Candidate members

A list of 27 candidate members as of 24th May 1989 is given below:

ATSUSHI, TANIMURA	Tokyo, Japan
BAN, SYAHEI	Hakodate, Japan
BRON, JAMES	Lochailort, Scotland
FUKUCHI, MITSUO	Tokyo, Japan
GALASSI, DIANA	L'Aquila, Italy
HAIRSTON, NELSON	New York, U.S.A.
HATTORI, HIROSHI	Sapporo, Japan
HIRAKAWA, KAZUMASA	Tokyo, Japan
ISHII, HARUTO	Tokyo, Japan
ITOH, HIROSHI	Kawaguchi-city, Japan
IWASAKI, NOZOMU	Kochi, Japan
KAWABATA, KEIICHI	Otsu, Japan
KAWAMURA, AKITO	Hakodate, Japan
KOTANI, YUICHI	Shiogama, Japan
MINODA, TAKASHI	Hakodate, Japan
MOSKOWITZ, STUART	New York, U.S.A.
MOVERLY, JOHN	Hobart, Australia
NOMURA, HIDEAKI	Tokyo, Japan
OHMAN, MARK	La Jolla, U.S.A.
OLDEWAGE, WILLEM	Johannesburg, South Africa
OMORI, MAKOTO	Tokyo, Japan
OTHMAN, ROSS	Selangor, Malaysia
PESCE, GIUSEPPE	L'Aquila, Italy
RAMA DEVI, CHINTALA	Nagarjunanagar, India
SEGUIN, GERARD	Nice, France
UHLIG, GOTRAM	Helgoland, F.R. Germany
YOKOUCHI, KATSUMI	Shiogama, Japan

6. List of Applicants

The following 11 people as of 24th May 1989 are having their application processed:

BROWNELL, CHARLES	Honolulu, U.S.A.
DEMEULENAERE, B.	Brussels, Belgium
GALBRAITH, MOIRA	Sydney, Canada
GRESTY, K.	Exeter, England
HIROTA, R.	Sapporo, Japan
ISHIDA, T.	Hokkaido, Japan
JANETZKY, WOLFGANG	Oldenburg, F.R. Germany
KIM, SE-WHA	Seoul, Korea
ROBERTSON, A.	Rockville pike, U.S.A.
STEIB, KARL	Oftersheim, F.R. Germany

C. Corkett (General Secretary)

7. Mailing list

Gerd Schriever keeps the official mailing list of members and names of those who have paid their dues. If you change your address or have a query about your dues you should contact Gerd.

8. By-laws

A copy of the by-laws is reproduced in *MONOCULUS* No. 11, October 1985.

9. *MONOCULUS*

All active and founder members must pay dues. All active and founder members receive *MONOCULUS* free. Candidate members are not required to pay dues. Any candidate members who wish to receive *MONOCULUS* should send their name to Gerd Schriever to be put on the mailing list. They might also like to consider giving an optional donation to help defray costs of publishing and mailing *MONOCULUS*. (See above for address of Gerd Schriever).

WAC - TREASURER's REPORT 1987/1988

1. The financial situation

	01.10.-31.12.1987	01.01.-31.12.1988
Balance forward	**5,427.64 DM**	**5,671.97 DM**
Deposits	229.69 DM	1,637.18 DM
Interests	27.54 DM	124.70 DM
Donation of the 3rd Conf.Cop. London	---	1,313.17 DM
Total	257.23 DM	3,075.05 DM
Expenses		
Support of *MONOCULUS* 87/88	---	883.30 DM
Account dues	12.90 DM	55.90 DM
Total	244.33 DM	2,135.85 DM
Balance	**5,671.97 DM**	**7,807.82 DM**

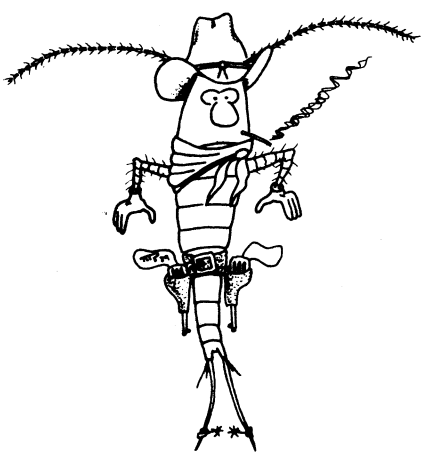
2. General remarks

There certainly are Associations richer than ours. However, we don't exactly know how rich we really are. This has to do with the postponement of payment we suggested to you in times of unfavourable exchange rates. In the last issue we asked you to resume payment and did not have to wait long for the first cheques to arrive.

Until the end of 1988 dues had been received from 122 out of 257 members. If you don't know whether you are in arrears, dear member, please consult page 4 of *MONOCULUS* No. 17, where all debtors have been put in the pillory. If you want relief from this uncomfortable situation pay your dues immediately.

Despite the great number of outstanding claims our balance is better than it should be. This has 3 reasons:

- Some have paid their dues for 2 or even more years in advance.
- When the first cheques arrived in 1986 the exchange rate US $/DM was still rather advantageous.
- There have been many donations, among them a particularly impressive one from the 3rd Conference on Copepoda in London (three cheers to Geoff Boxshall!).



3. Cheques without names

It is a rather hazardous practice to send me money orders without any indication of the sender's name. The addresses of the bank or the research institute may be valuable clues, but when there are more than one member at the same institute I am at a loss.

Who recognizes his/her cheque by the following information?

- 14.- US $ from a bank in Haifa/Israel;
- 14.- US $ from France, close to Paris by Commerzbank New York for abonnement revue;
- 44.- DM from the Fac. of Applied Biological Sciences, Hiroshima University;
- 21.- US $ from Sweden, Univ. of Stockholm, Dept. of Zoology, Biologilab., 10691 Stockholm.

These cheques were received in December 1988.

G.S.

BRUNO SCOTTO DI CARLO (1939-1988)
PATRIZIA MASCELLARO (1958-1988)
VINCENZO TRAMONTANO (1940-1988)

On December 15, 1988 the Italian and International scientific community was struck by a tragedy without precedence for the Mediterranean Sea when the research vessel Posillipo of the Stazione Zoologica sank in the waters of the Gulf of Naples following a violent storm. Of the four members of the crew, consisting of Bruno Scotto di Carlo, Head of the Biological Oceanography Department, his young research assistant Patrizia Mascellaro, the Captain-master Vincenzo Tramontano and the ship-mate Francesco DiLiello, only the last has survived to give this brief account of what happened that day.

The weather that morning was good and the sea calm as the four crew members sailed out on what was supposed to be a routine sampling cruise in coastal waters of the Gulf. But on their way back home in the early afternoon, the boat got caught in a violent storm. Apparently a crack in the sheathing of the bow or stern forced Bruno and the others to lower two of the life

boats and abandon the vessel. The boat had begun to fill with water slowly and the crew members had had sufficient time to try to launch several SOS signals, none of which were received by any of the harbor offices within the Gulf. About 10 minutes or so after having abandoned the boat, one of the two life boats, with Patrizia and the Captain-master on board, capsized and both persons were immediately lost. The second life boat with Bruno and the young ship-mate was found only 6 days later, about 50 or 60 miles SE off the Island of Capri. By then it was too late for Bruno who had passed away two days before from the cold and anguish, I think, of having seen two of his close colleagues die in such a tragic way.

Bruno was a well-known authority in the field of copepod research, having contributed significantly, over the last twenty years, to the comprehension of problems related to the ecology and biogeography of Mediterranean copepods. His studies spanned from the systematics and faunistics of planktonic copepods to more general aspects of copepod ecology such as the vertical migration and zonation of deep-sea copepods and the role of planktonic copepods in the overall dynamics of pelagic food webs. More recently, to better understand key aspects of copepod ecology in coastal environments, his interests had also embraced studies in their basic reproductive biology and population dynamics.

Bruno had originally begun working on fossil foraminiferans at the University of Naples having obtained his doctorate's degree in Geological Sciences from that University in 1963. Due to a series of curious circumstances, Bruno was recommended as a possible candidate for a postdoc fellow at the Stazione Zoologica in 1965 to initiate studies on zooplankton and, in particular, on the taxonomy and ecology of copepods. There had not been anyone on the staff of the Institute specializing in this field since the time of Giesbrecht. So Bruno was sent off, arms and baggage, to Dubrovnik - Jugoslavia for a 3-month stage with Jure Hure and Tomo Gamulin of the Bioloski Insti-

tute to learn the systematics of copepods and a number of other taxonomic groups such as the amphipods and siphonophores. This proved to be a critical decision in Bruno's life since it paved the way for a permanent position at the Stazione Zoologica for the next 23 years and a long-lasting and fruitful collaboration with Hure of the Bioloski Institute with whom Bruno would continue working until Hure's retirement in 1982.

One of the first problems that Bruno and Hure worked on was the comparison of the zooplankton of the Adriatic and Tyrrhenian Seas in the broader perspective of comparing the faunas of western and eastern Mediterranean basins (4,5,7,10). These studies revealed that the plankton fauna was highly diversified with 149 copepod and 45 hyperiid amphipod species in the Tyrrhenean Sea and a corresponding 145 and 40 species belonging to these two groups in the Adriatic. They also demonstrated the strong analogy between these two Seas, both with regards to the neritic fauna and that of offshore waters. The only significant differences were due to the two copepod species Calanus helgolandicus and Euchaeta hebes which are rare in the Tyrrhenian Sea but quantitatively very important in the Adriatic.

To better define deep Mediterranean copepod assemblages which had been poorly studied up to the time, Hure and Scotto di Carlo conducted a new series of studies (8,13) on the vertical distribution of copepod communities to 1000 m. This work showed that the Adriatic Sea was quantitatively much richer than the Tyrrhenean, especially with regard to its deep-sea fauna. In terms of species composition, however, the faunas of these two basins were fundamentally the same.

Later studies (11,14,15,24,29) defined a distribution model for Mediterranean copepods to the 3000 m depth. The objective of these studies was to describe the structure of copepod communities at the various depths, seasonal variations in

vertical distributions, and diel and ontogenetic migration patterns with the aim of verifying whether the zonation model proposed by Vinogradov for oceanic basins was applicable for the interpretation of the distribution and dynamics of Mediterranean communities. The results of these studies led to the identification of vertical patterns in the Mediterranean Sea that differed substantially from the oceanic ones. Other studies on vertical distribution patterns (11,14) revealed inverse migration patterns for small midwater species belonging to the genera Spinocalanus, Mormonilla and Oncaea which consisted in the upward migration of these species to shallower dephts during the day and their downward sinking at night.

A series of studies were also conducted to define the spatial and temporal distributions of copepod communities in the Adriatic Sea (9,16,17,20,21,23). This work has elucidated the dual physiognomy of this basin with a shallow northern section, characterized by high density values and the dominance of a limited number of species, and a deep southern section with a notable species diversity and the presence of a large number of species that comprise relatively uniform but quantiatively poor populations.

Bruno has also conducted studies on the systematics of a number of important genera such as Vettoria, Scaphocalanus and Clausocalanus (2,3,6,12) and on the stomach content analysis of myctophiid fishes (18,26,30).

More recently, with the aim of fostering an interdisciplinary group at the Stazione Zoologica, Bruno's interests focused on the dynamics of coastal pelagic communities, particularly on the role of zooplankton in eutrophied coastal areas (27,38,25, 31,32). His studies in this period had also been centered on the reproductive biology of typical coastal species such as Acartia clausi and Temora stylifera (35,36) and the impact of parasitism in coastal copepod communities (34,37,38).

The result of Bruno's scientific activities have appeared in leading journals such as the Pubblicazione della Stazione Zoologica di Napoli, Journal of Plankton Research, Marine Biology, Marine Ecology Progress Series and Marine Ecology P.S.Z.N.I. As Head of the Biological Oceanography Department of the Stazione Zoologica, Bruno had strongly endorsed marine ecology as one of the principal activities of the Stazione Zoologica. To this end he organized interdisciplinary projects in plankton research and attracted young scientists to participate in them, inspiring his staff to the highest of research standards. Due to his active role in promoting co-operative work among scientists, he had been recently elected President of the Plankton Committee of the International Commission for the Exploration of the Mediterranean Sea (C.I.E.S.M.). For those of us who have worked with him, Bruno's death represents an immense loss in both human and professional terms. I myself have only found comfort in the fact of having been extremely fortunate to have worked with such a generous and sagacious person for the last 12 years. My sense of desolation is knowing that I may never be able to supplant him as a teacher, colleague and friend.

Patrizia Mascellaro, who had obtained her doctorate's degree from the University of Naples in 1983, had only recently begun working with Bruno on aspects regarding the spatial and temporal distribution of copepod communities within the Gulf of Naples and on problems related to the reproductive biology of coastal copepod species. Strangely enough, her early work, like Bruno's, had mainly included studies on the distribution and systematics of fossil ostracods. From 1983-1986, as research fellow of the Stazione Zoologica, Patrizia's studies mainly focused on various problems related to the horizontal and vertical distribution of benthic ostracods and the systematics and paleoecology of this group over the last 10 million years. The principal aim of these studies, conducted within the framework of an international programme (I.P.O.M.: international programme on the study of the origin of the

Mediterranean Sea) was to describe the origin and evolution of the Mediterranean over the last 10 million years. In 1987, Patrizia begins working with Bruno on a number of programmes, the aim of which was to study the dynamics of coastal pelagic zooplankton communities and role of zooplankton in eutrophied littoral areas. This represented a period of enormous change for Patrizia who is about to undertake a series of studies in a totally different field of research, a task she will accomplish brilliantly. During this last period, her studies will also focus on various aspects of the reproductive biology of coastal copepods and the histo-pathological effects of parasitism in this group. Patrizia was a very lively and joyful person who helped secure close ties with colleagues and friends. I believe she represented a solid promise for the future development of the Biological Oceanography Department at the Stazione Zoologica which will suffer enormously for her loss.

Vincenzo Tramontano has been Captain-master of our oceanographic vessel for the last 8 years. Vincenzo had worked at the Stazione Zoologica since he was 15, collecting live material for experimental work at the Institute. Over the years, he had acquired a vast experience in the recognition and handling of a great variety of marine organisms in the Gulf of Naples. For many of us, he has been a master of seamanship having taught us how to work at sea. Vincenzo had a natural inclination to working at sea where he felt at home. Unhappily, his great affinity with the sea has been tragically underlined on this occasion by the fact that Vincenzo is the only one of the lost party whose body the sea has refused to return to family and friends.

Adrianna Ianora

LIST OF SCIENTIFIC PUBLICATIONS

SCOTTO DI CARLO, B. - 1966: Le Alveoline del Gargano nord-orientale. Pal.Ital. 61: 65-73

SCOTTO DI CARLO, B. - 1967: Description of the male of Corissa parva FARRAN (Pelagic Copepoda). Pubbl.Staz.Zool.Napoli 35: 239-242

HURE, J. & B. SCOTTO DI CARLO - 1967: Revision du genre Vettoria WILSON, 1924 (copépodes pélagiques). Pubbl.Staz. Zool.Napoli 35: 286-299

GAMULIN, T., J. HURE & B. SCOTTO DI CARLO - 1968: Comparazione tra lo zooplancton del Golfo di Napoli e dell'Adriatico meridionale presso Dubrovnik. Pubbl.Staz.Zool.Napoli 36: 8-20

HURE, J. & B. SCOTTO DI CARLO - 1968: Comparazione tra lo zooplancton del Golfo di Napoli e dell'Adriatico meridionale presso Dubrovnik. I. Copepoda. Pubbl.Staz.Zool. Napoli 36: 21-102

HURE, J. & B. SCOTTO DI CARLO - 1968: Two new species of Scaphocalanus (Copepoda: Calanoidea) from the Mediterranean Sea. Pubbl.Staz.Zool.Napoli 36: 152-166

SCOTTO DI CARLO, B. - 1968: Quelques considerations sur les Copépodes pélagiques de profondeur du Golfe de Naples. Rapp. Comm.int.Mer Médit. 19: 501-503

HURE, J. & B. SCOTTO DI CARLO - 1969: Ripartizione quantitativa e distribuzione verticale dei Copepodi pelagici di profondità su una stazione nel mar Tirreno ed una nell' Adriatico meridionale. Pubbl.Staz.Zool.Napoli 37: 51-83

HURE, J. & B. SCOTTO DI CARLO - 1969: Copepodi pelagici dell' Adriatico settentrionale nel periodo gennaio-dicembre 1965. Pubbl.Staz.Zool.Napoli 37 (2): 173-195

HURE, J. B. SCOTTO DI CARLO & A. BASILE - 1969: Comparazione tra lo zooplancton del Golfo di Napoli e dell'Adriatico meridionale presso Dubrovnik. II. Amphipoda (Hyperiidea). Pubbl.Staz.Zool.Napoli 37: 599-609

HURE, J. & B. SCOTTO DI CARLO - 1969: Diurnal vertical migration of some deep water Copepods in the Southern Adriatic (East Mediterranean). Pubbl.Staz.Zool.Napoli 37: 581-598

HURE, J. & B. SCOTTO DI CARLO - 1970: Distribuzione e frequenza delle specie del genere Clausocalanus Giesbrecht, 1888 (Copepoda: Calanoida) nel Golfo di Napoli e nell' Adriatico meridionale. Pubbl.Staz.Zool.Napoli 38: 289-304

HURE, J. & B. SCOTTO DI CARLO - 1971: Importance quantitative et distribution verticale des Copépodes pélagiques de profondeur de la mer Tyrrhenienne et de l'Adriatique méridionale. Rapp.Comm.int.Mer Médit. 30: 401-404

HURE, J. & B. SCOTTO DI CARLO - 1974: New patterns of diurnal vertical migration of some deep water copepods in the Tyrrhenian and Adriatic seas. Mar.Biol. 28: 173-184

SCOTTO DI CARLO, B., J. HURE & A. MIRALTO - 1975: Bathypelagic Copepods collected off island of Ponza (Mediterranean Sea) in June 1973 and June 1974. Pubbl.Staz.Zool.Napoli 39: 176-186

HURE, J. & B. SCOTTO DI CARLO - 1977: An account of the Copepod distribution of the surface community in the Adriatic Sea. Rapp.Comm.int.Mer Médit. 24: 133-134

HURE, J., A. IANORA & B. SCOTTO DI CARLO - 1979: "Vila Velebita" Expedition in the Kvarner Region (Adriatic Sea). Planktonic Copepods. Thalassia Jugosl. 15: 203-216

BERDAR, A., G. COSTANZO, L. GUGLIELMO, A. IANORA & B. SCOTTO DI CARLO - 1979: Some aspects on the feeding habits of two species of mid-water fishes stranded on the shores of the Strait of Messina. Rapp.Comm.int.Mer Médit. 25/26: 209-210

CARRADA, G.C., T.S. HOPKINS, G. BONADUCE, A. IANORA, D. MARINO, M. MODIGH, M. RIBERA d'ALCALA & B. SCOTTO DI CARLO - 1979: Primi risultati delle ricerche sull'idrografia e la produzione planctonica nel Golfo di Napoli. Atti Convegno Scientifico Nazionale CNR. Progretto Finalizzato Oceanogr. e Fondi Marini 1: 83-94

HURE, J., A. IANORA & B. SCOTTO DI CARLO - 1979: Spatial distribution of pelagic copepods in the Adriatic Sea. Rapp. Comm.int.Mer Médit. 25/26: 141-142

HURE, J., A. IANORA & B. SCOTTO DI CARLO - 1979: Copepod density in the open waters of the Adriatic Sea. Rapp.Comm. int.Mer Médit. 25/26: 139-140

CARRADA, G.C., T.S. HOPKINS, G. BONADUCE, A. IANORA, D. MARINO, M. MODIGH, M. RIBERA d'ALCALA & B. SCOTTO DI CARLO - 1980: Variability in the hydrographic and biological features of the Gulf of Naples. P.S.Z.N. I: Mar.Ecol. 1: 105-120

HURE, J., A. IANORA & B. SCOTTO DI CARLO - 1980: Temporal and spatial distribution of copepod communities in the Adriatic Sea. J.Plankton Res. 2: 1-22

IANORA, A. & B. SCOTTO DI CARLO - 1981: Vertical distribution of Mediterranean deep-sea copepods. Rapp.Comm.int.Mer Médit. 27: 165-167

IANORA, A. & B. SCOTTO DI CARLO - 1981: Distribution and annual cycles of Siphonophora Calicophora in the Gulf of Naples and adjacent waters. Arch.Oceanogr.Limnol. 20: 51-65

SCOTTO DI CARLO, B., G. COSTANZO, E. FRESI, L. GUGLIELMO & A. IANORA - 1982: Feeding ecology and stranding mechanisms in two lanternfishes Hygophum benoiti and Myctophum punctatum. Mar.Ecol.Prog.Ser. 9: 13-24

SCOTTO DI CARLO, B. & A. IANORA - 1983: Standing stocks and species composition of Mediterranean zooplankton. In: CARRADA, G.C., T.S. HOPKINS, LJ. JEFTIC, S. MORCOS (eds.) Quantitative analysis and simulation of Mediterranean coastal ecosystems: the Gulf of Naples, a case study. Unesco Rep.Mar.Sci. 20: 59-69

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Emilia Stella Emilia Stella

Interviewing copepodologists

"Difficulties are very useful for the character." Never to give up is one of her secrets. The problems of reorganisation after the end of the last war were especially demanding. *"Funds were scanty, transport almost inexistent, the equipment rather inefficient. It was difficult to reach the sampling sites. We had to walk there and carry home the samples on our back: a rucksack full of bottles filled with water!"* She retired ten years ago and is still active as a guest at the

Zoological Institute of the University of Roma. *"I feel young because I am among people in the Institute."* She helps students. *"You don't teach, you help other people."* Working conditions have changed a lot since her own beginnings at university, but have students as well? *"Young scientists have more means at their disposal today. Research now is rather comfortable."* She has the impression that students are less inclined to make sacrifices these days. If there are first difficulties they tend to give up earlier. *"No tenacity."* Another concern is that young people are not interested in old studies. They don't know the history because they are more interested only in recent literature. One effect of this is that sometimes they think they have made a discovery which in fact has been made already years ago. *"Most of the general ideas are old."* It is good therefore to write reviews because this leads to new insights.

Her preoccupation with copepods is of long standing. *"During the years 1926-1931 I was a student at the University of Pavia and under the guidance of Prof. Cesare Artom, an eminent cytologist, I took my degree with a thesis on the cytology of some species of cyclopoids from a small lake near the town."* The interviewer's first encounter with her name, however, was in connection with thermosbaenaceans. *"Yes, although I have not especially been interested in groundwater fauna in 1953 I had the opportunity to examine the plankton of a lake in a cave in central Italy and I discovered a new species of the genus Monodella which I called M. argentarii from the name of the site (Monte Argentario). It was the second species found in Italy and as I disposed of living specimens I could also study the development and the behaviour of this interesting animal."* One of the visits to this cave is still in fresh memory because of an awkward situation. *"Leaving the cave after successful work my colleagues and I discovered that our personal effects which we had concealed in a hiding place had been stolen while we were in the cave. Nobody gave us a lift and we had to walk in short trousers and very dirty to the nearest police station."*

But thermosbaenaceans had only been a short episode in her scientific activities which from the very beginnings had centered around copepods. However, after graduation when she was a voluntary assistant at the Institute in Pavia she extended her studies to the cytology of the anostracan Artemia salina. In 1935 a burse from the Ministry of Instruction enabled her to go to another research institute and she opted for the Zoological Institute at the University of Roma. The next year she went with a burse from the Ministry of Foreign Affairs to Geneva to work on the genetics of Drosophila under Cuénot.

"But about that time I was attracted by another field of investigations. Between the thirties and fourties in Italy 'limnology' became a science with suitable perspectives and programmes. A series of investigations were carried out on alpine and subalpine lakes." These investigations were initiated by Rina Monti (her mother), the first woman ever to hold a University chair in Italy , who by then was professor of Zoology at the University of Milano. *"It was under her guidance that I did my first steps in limnology studying the copepods of some small alpine lakes."*

After the war in 1945 she was Teaching Professor of Hydrobiology (limnology and oceanography) at the University of Roma. From modest beginnings an active group of limnologists developed over the years.
A photo taken at her 80th birthday shows her amidst her oldest and younger pupils who *"have always given me great satisfaction." "With a few willing students we started again some studies immediately after the war on small basins near Roma, and in 1947 embarked on a long series of investigations on the planktonic and*

benthonic communities of Lake Albano. These studies have been resumed by our team with much more sophisticated methodology in recent years. Later on our studies were extended to other latial lakes and temporary basins, and cooperation was established with researchers of other disciplines (botanists, geologists) in order to verify the conditions of pollution of these lakes."

But her interest in crustaceans and particularly copepods has nevertheless been prevailing as is shown by her works on the calanoids and cyclopoids of the temporary waters of Sardinia and of the Tyrrhenian latial coast. *"During one of my frequent visits to the Hydrobiological Institute of Pallanza at the Lago Maggiore I studied the biological cycle of a Cyclops of the bottom of the lake. Recently, I published a guide for the study of Italian calanoids and a volume on the Calanoida in the collection of the 'Fauna d'Italia'."*

Women scientists have played a prominent role in crustacean research. The Journal of Crustacean Biology has started a series of retrospectives and not surprisingly more women than men have been portrayed in this series so far: Dorothy Bliss, Isabella Gordon, Marie V. Lebour, Sidnie M. Manton, Mildred Stratton Wilson. Among copepodologists the situation is only slightly different. Especially in the young generation women form a conspicuous proportion. In the older days their numbers were smaller and what about their recognition among colleagues and their professional perspectives? *"As you have seen I had some difficulties at the beginning of my scientific activities, but these were mostly of a technical nature. I have always been treated by colleagues, women and men alike, with friendship and consideration. May be that this is different in countries where the scientific tradition is not so old as it is in the European countries and particularly in Italy. When I was young, women who chose an academic career were not so numerous as they are now. But in Italy the universities were relatively few and the chairs restricted to a few scientific*

disciplines. Competition for such a position therefore was rather severe, especially for women who were required to be much more capable than men. At present the situation has changed: a great number of women go to the university in Italy, particularly in scientific faculties. They have greater possibilities in different fields of the scientific world, both in teaching and in practical applications."

'Women in crustacean research' would make a fascinating book, wouldn't it? Who is going to write it, girls?

H.K.S.

N N E
A N U C M N S
O E T

FOURTH INTERNATIONAL CONFERENCE ON COPEPODA
Karuizawa Seminor House of Nihon University, Karuizawa
16th-20th September 1990

The Fourth International Conference on Copepoda will be held at Karuizawa Seminor House of Nihon University, Karuizawa, Nagano Prefecture, from September 16 (Monday) to 20 (Friday), 1990, under the following host and sponsors.

Host: World Association of Copepodologists (WAC)
Sponsors: Plankton Society of Japan
Oceanographical Society of Japan
Japanese Society of Scientific Fisheries
Zoological Society of Japan
College of Agricultural and Veterinary Medicine
Nihon University
Co-sponsor: Karuizawa Town

The aim of this conference is to provide a forum where all aspects of scientific research relating to copepods can be communicated and discussed in a pleasant and open atmosphere. This conference is of special significance since it will be the first to be held in Asia. The Organizing Committee invites participation of copepodologists from all countries.

Karuizawa is located 1,000 m above the sea level, enjoys cool and dry summers and is one of Japan's most fashionable inland resorts. It takes approximately two hours by a limited express train from Tokyo. Since the Seminor House provides a hall, lecture rooms, a cafeteria and bedrooms, we can eat, drink, sleep and discuss under the same roof.

SCIENTIFIC PROGRAMME

The scientific programme is being coordinated by the Organizing Committee which comprises Dr. Sadami Kadota (Chairman, Nihon Univ., Tokyo), Dr. Shuhei Nishida (Local arrangements, Tokyo Univ., Tokyo), Dr. Geoff Boxshall (British Museum,

London), Dr. Kurt Schminke (Univ. Oldenburg, Oldenburg), Dr. Gerd Schriever (Univ. Kiel, Kiel) and Dr. Shin-ichi Uye (Secretary, Hiroshima Univ., Higashi-Hiroshima). The formal programme consists of:

1. Four half-day symposia of invited papers on the following themes (tentative):
   Copepod Feeding and Behaviour in Environment with Low Food Concentrations (chaired by Dr. Michael J. Dagg, LOMCON, Louisiana)
   Copepod Distributions in Coastal Zone Waters (chaired by Dr. Brian P. Bradley, Univ. Maryland, Maryland)
   The Roles of Copepods in Fisheries (chaired by Dr. Michael M. Mullin, SIO, Univ. Calif., California)
   Symbiotic Copepods of Invertebrates (chaired by Dr. Arthur G. Humes, Boston Univ. Marine Program, Massachusetts)

2. One or two evening discussions:
   The themes are not fixed yet.

3. Eight-ten contributed paper sessions:
   Probably we will run two sessions simultaneously.

4. Poster presentations

CALL FOR PAPERS

Persons who wish to present a paper in the contributed paper sessions and/or poster sessions are asked to complete and return the Call for Papers form, which will be enclosed in the NEXT ISSUE of *MONOCULUS*.

The Organizing Committee will accept as many contributed papers as possible. Papers which have already been published or presented at another meeting are not acceptable. If there are more contributed papers than time allows the Committee may have to accomodate some of these papers in poster sessions.

Each contributed paper will be allowed 15 minutes for oral presentation and 5 minutes for discussion. Official language will be English.

PROCEEDINGS

The proceedings will be published in English in Special Publications of the Seto Marine Biological Laboratory, Kyoto University. The instructions for manuscript preparation will be enclosed in the next issue of *MONOCULUS*.

REGISTRATION

Although the Organizing Committee attempts to obtain some financial support from various organizations, the Conference will be largely self-financing. The organization of the Conference is based on advanced registration. Registration fees, which include a copy of proceedings, party, conference dinner, and excursion, will be 30,000 Yen (currently about 400.- DM or about 200.- US $) for regular participants and 20,000 for students.

ACCOMODATION

Since the Seminor House can accomodate up to ca. 300 people at one time, all the participants can perhaps stay there. The House is not completely in western style, but provides 49 Japanese style rooms with tatami mat floor and 20 rooms with two-stories beds. Participants will be requested to share the room. The price will probably be less than 3,500 Yen per day including three meals. Hotels and guest houses (called "pensions") are available around the Seminor House, which cost 7,000-20,000 per night including supper and breakfast.

CORRESPONDENCE

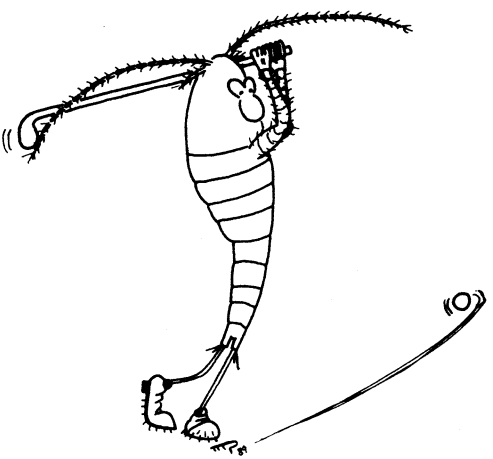
Correspondence relating to the Fourth International Conference on Copepoda should be addressed to:

Dr. Shin-ichi Uye
Secretary, Fourth International Conference on Copepoda
Faculty of Applied Biological Science
Hiroshima University
Higashi-Hiroshima 724, Japan

CONFERENCE LOGO

Designed by Dr. Y. Kikuchi (Ibaraki Univ.)

FLIGHT TO JAPAN FROM EUROPE



In the editorial last time we asked who is interested in a group flight to Japan to make travelling cheaper. Here is one of the reactions:

Reading your note in MONOCULUS 17 about a possible group flight in 1990 to the 4th Conference in Japan, I will hereby inform you that I and a colleague are interested in such a possibility. Regarding the relative high costs of Japan, we expect that either one or none of our institute will be allowed to attend, but maybe we can persuade our directors when they see the eventual substantial reduction in flight price and a list of European colleagues who have expressed the intention to attend the conference in Japan.

We need many more reactions to consider organizing a group flight. Please let me know quickly in case you are interested.

Kurt Schminke

ODE TO CALANUS
(With apologies to the late Professor Walter Garstang)

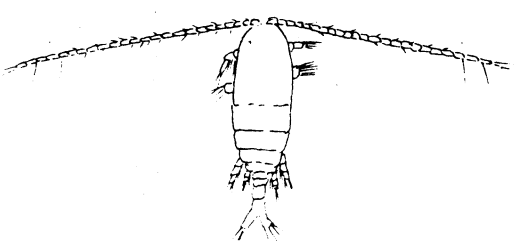
Alexander the Great, a handsome Greek,
Went to India for a date
But instead he met a Holy Man,
With outstretched arms saying "Kalyan"
"Peace be with you" was what he meant,
While on his way he went.

The soldiers set him on his horse
He was known they said, as Kalanos
2,000 years had passed away.
When a scientist by the name of Leach,
Was one day paddling on the beach,
And spied a beastie with outstretched arms,
Which reminded Leach of those "Kalyans".

So to name his beastie small and cute
He changed the Greek to Calanus the latin root.
Cala - bringing its message to you and me
Of peace across the mighty sea
Whither we be Gael, Hindu or Scicilian
The message is carried by copepods in the million.
So Calanus, the copepod,
Was named from this Man of God.

The greatest herbivore in the sea,
Calanus, spends its life drifting free,
Eating Diatoms and Dinoflagellates,
Which eventually arrive on our plates,
As Herrings, and Kippers, on which we dine.
May this continue to the end of time,
But only if we take care,
To catch no more than our fair share
Leaving others there to reproduce
Future generations to induce
May we always, with respect
Father Neptune's Kingdom to protect.

Alan E. Joyce



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CATALOGUE DES NOUVEAUX COPEPODES HARPACTICOIDES MARINS

Referring to our announcement of Bodin's new catalogue (*MONOCULUS* 17: 28) C.-t. SHIH (National Museum of Natural Sciences, Zoology Division, P.O.Box 3443, Station D, Ottawa, Canada K1P 6P4) makes the following offer:

In the last issue of MONOCULUS, you suggested that colleagues in each country should order Prof. Bodin's catalogue of harpacticoids together. The only way this can be done is to announce it in the next issue of MONOCULUS. If you intend to do so, I have no objection that my name be listed for Canada (or even for North America). I find Prof. Bodin's catalogue very useful. My 1979 edition of his catalogue has been well used and full of additional notes.

The l e t t e r box

C. CORKETT (Halifax, Canada) informs us:

I recently completed 20 years of full-time research on marine copepods, 15 of which were completed in collaboration with Ian McLaren. In the fall of 1986, I accepted a full-time teaching position as Instructor in the Biology Department and so the time has come for me to leave research.

My last few years of work in the McLaren laboratory have been particularly rewarding.

Now that Bruce Frost has completed his taxonomic revision of Pseudocalanus, I am sure we will see a return to former levels of research on this genus and I look forward to keeping up with the literature.

T. ISHIDA (Yoichi-machi, Hokkaido, Japan) sends the following considerations:

I am studying now copepods fauna of the tidal reach of River Yoichi, neighbouring to my home. It is a suitable theme for a retired person.

Roots of limnoplanktonic copepods

About fourty years ago, when I was a student of Prof. S. Motoda of the Hokkaido University, he taught me some theories on the roots of limnoplankton. One of the theories, which remains in my memory, was the emigration theory by waterfowl foot. For a long time, my knowledge of this problem had not exceeded the waterfowl theory.

Ten years ago, I began to study freshwater harpacticoid copepods. During this study, I was surprised to find that almost all copepods and cladocerans have a benthic life style in some waters, not only standing waters, but also running waters from trickles to rivers. Based on this finding my understanding of the roots of limnoplankton has reached that planktonic crustaceans in lakes were primarily derived from areas in which the lake had been born.

It is natural that the majority of lakes in the world, except Baikal, Titicaca, Biwa, etc., are of ephemeral existence geologically, in which animal evolution would be interrupted. On the other hand, rivers and their connecting waters such as lowland stagnant waters and estuaries have been in continuous existence since the separation of sea and land on the earth, and the "life-span" of rivers is tremendously longer than the duration of evolution of animals.

Z. KABATA (Nanaimo, Canada) makes the following announcement:

During WAC's Third International Meeting in London in 1987 I told all who wanted to listen (and some who did not) that I am rapidly approaching my retirement. I am writing to you now to let you and all my friends know (through the pages of MONOCULUS) that I will retire as of March 1989. After 33 years of living with copepods I am closing my official scientific career.

I intend to finish descriptive work on fairly large material I still have in hand, but will not continue with this line of work. After decades of abuse, my eyes decided to rebel and refuse further service. I will not leave the field of copepodology altogether (what else is there?), but will cut down on activities, concentrating more on synthesis and broader view of the field.

My address will remain for the time being the same. I will keep my office and use facilities of my institute, the Pacific Biological Station. I will still welcome reprints and hope to hear from you all from time to time.

I want to thank you and all copepodologists with whom I have maintained exchanges over many years for kindness shown to me and for ever-present readiness to help. I wish you all success, both personal and professional, in this brand new year 1989 and always.

J.H. STOCK (Amsterdam, The Netherlands) writes:

Enclosed "funny snippet" might be of use for the next issue of MONOCULUS.

Nothing else right now on my mind - but for wishing you all the best for the coming year (my last year at the University, since I shall retire early 1990).

Clausia lithographica Oppenheimer -- a Jurassic copepod?

Clausia Claparède, 1873, is a well-known genus of associated, poecilostomatous Copepoda, as a matter of fact the type-genus of the family Clausiidae. I was pleasantly surprised, therefore, to learn about the existence of Clausia lithographica, described a century ago by Oppenheim (1888) from the Solnhofener lithographic limestones (Malm, Late Jura). Many eminent carcinologists (Holthuis, Manning, Rolfe, Secretan

...) have discussed this enigmatic fossil. If it were a copepod, it would be one of the oldest fossils of the group known. However, no such joy: Clausia Oppenheim, 1888 is merely a junior homonym of Clausia Claparède, 1873. The exact systematic position of the fossil remains obscure: it surely is no copepod, but it has variously been attributed to the Stomatopoda, Mysidacea, Cirripedia, "larvae", and "odd organisms".

The homonymy is exposed here for the first time, the rest of this note draws heavily from a review paper by H. Polz (Archaeopteryx, 6: 69-73, 1988), who ably coined the name "Urvögel des kleinen Mannes" for these curious arthropod fossils.

MODEL DESCRIPTION **I. *Harpacticoida*** **MODEL DESCRIPTION**

Reactions

I have a few comments on the estimable model description of a harpacticoid, bravely presented by John and Geoff. As with Oliver Twist and his oatmeal, I would want just a bit more!

- *Please include figures of the connecting lamellae (basal plates) of P1-4. These are often ornamented, and knowledge of their shape and/or ornamentation has proven useful in cyclopoid taxonomy.*
- *Dick Hamond has been pleading for authors to include a description of the mounting media, staining, and microscopes employed, so that readers may judge what degree of detail might be expected to have been seen. I agree.*
- *The "genital field" of the particuluar species illustrated includes only the P6's, and is thus a bit misleading.*
- *Other structures which might require special notice in some families include somitic setule patterns and hyaline areas ("nuchal organs", etc.); detail of the anal operculum; and detail of the rostrum.*
- *The antennule might better be included on the same plate with other anterior appendages; i.e., the figures and text*

are out of order. A figure of the antennule of the male is lacking.

- *Eugene Schmitz, Editor of the Transactions of the American Microscopical Society, has reminded me of the difference between the terms "variability" and "variation": the former indicates a potential, while the latter indicates what has actually been observed.*
- *The description is nicely economical, letting the figures convey most of the information. Authors who adopt this philosophy must take care to supply large, detailed figures. As printed in MONOCULUS, the figures in this article are just about at minimum visibility, and could be a bit larger.*

J.W. Reid, Washington

Now seriously: with reference to the "model description" by Wells and Hicks.

The figures are extremely well done. The text, however, gives the feeling of an unpleasant obligation. Not only is it too telegraphic, but the few written words are often irrelevant or just casual remarks (e.g. Antenna; Female P5).
There is no reference to the operculum, an important feature in the harpacticoids. The ornamentation of the body segments is very briefly mentioned and in a strangely styled "negative" way: "Anal somite lacking both sensilla set on small protuberances and pronounced epimeral projections". By the way, the same "projections" are called in the male "rudiments".
The use of Stereoscan, now available in most places, should help in the description of the many cuticular formations and sensillae, especially on the cephalothorax.
There is no illustration of the Antennula of the male; it is not enough to mention that it is "subchirocerate"(?)
The 2 "crescentric"(?) rows of the male can hardly be considered P6, especially if the illustration is so unclear.
The description should start with the mentioning of the num-

bers of specimens which were examined and the localities they came from. Otherwise the paragraph on "Variability" especially with the many exotic locality names, does not make too much sense.
In conclusion, it is a good description which certainly excells by its illustrations; the text is much poorer. There is no sense in trying to set a pattern for descriptions. They should be left at the discretion of the authors and emphasize the specific features of the taxon. Certainly they should be more explicit.

F.D. Por, Jerusalem

MODEL DESCRIPTION II. *Misophrioida* **MODEL DESCRIPTION**

The essence of the description is contained in the drawings of Rony Huys. I have added an extremely brief text drawing attention to noteworthy features.

Boxshallia bulbantennulata Huys

Prosome (Figs. 1A,B) with 4 free pedigerous somites, carapace absent. Urosome 5-segmented in female, with genital and first abdominal somites fused to form genital double somite. Urosome 6-segmented in male (Fig. 6A). Caudal rami with 6 setae (Figs. 7F,G).

Female antennule 27-segmented with aesthetascs on segments 11, 16 and 27 (Figs. 2B,C). Male antennule 23-segmented, bilaterally geniculate between segments 19 and 20 (Fig. 6B). First antennulary segment swollen in both sexes.

Antenna biramous (Fig. 3A); exopod 7-segmented, armed with 1,1,1,1,1,1,4 setae; endopod indistinctly 3-segmented, armed with 2,5,7 setae.

Mandible (Figs. 3B,C) with 3 setae on basis; endopod 2-segmented, armed with 4 and 7 setae; exopod 3-segmented, armed with 1,1,5 setae.

Maxillule (Fig. 3D) with 15 elements on praecoxal arthrite; coxa with 7 outer margin setae representing epipodite and large endite with 6 setae; basis with discrete proximal endite bearing 4 setae and incorporated distal endite represented by 4 marginal setae; exopod 1-segmented with 8 setae; endopod 1-segmented with 11 setae.

Maxilla (Fig. 7A) 6-segmented; praecoxa with 5 setae on proximal and 3 on distal endite; coxa with 3 setae on each endite; basis drawn out into large proximal endite; endopod 3-segmented.

Maxilliped (Fig. 2A) comprising syncoxa, basis and 6-segmented endopod; groups of 1,2,2,3 setae on syncoxa representing endites; basis with 2 setae; proximal endopod segment partly fused to basis; endopod segments with 2,2,2,2,3,5 setae.

Swimming legs (Figs. 4A,B, 5A,B) armature formula:

	coxa	basis	endopod	exopod
leg 1	0-0	I-I	0-1;0-1;I,I1,3	I-1;I-1;III,I,3
leg 2	0-1	I-0	0-1;0-2;I,I1,3	I-1;I-1;III,I,4
leg 3	0-1	I-0	0-1;0-2;I,I1,3	I-1;I-1;III,I,4
leg 4	0-1	I-0	0-1;0-2;I,I1,2	I-1;I-1;III,I,3

Fifth leg 4-segmented in female (Fig. 6C), with separate coxa and basis, and 2-segmented exopod. Coxae joined by intercoxal sclerite, basis with outer setae and inner seta representing endopod; exopod segments with 1 and 4 setae. Male fifth leg (Fig. 7C) similar but with coxa and basis fused.

Sixth legs represented by plates covering genital apertures, bearing 1 seta and 2 spinules in female (Figs. 7D,E) and 3 setae in male (Fig. 7B).

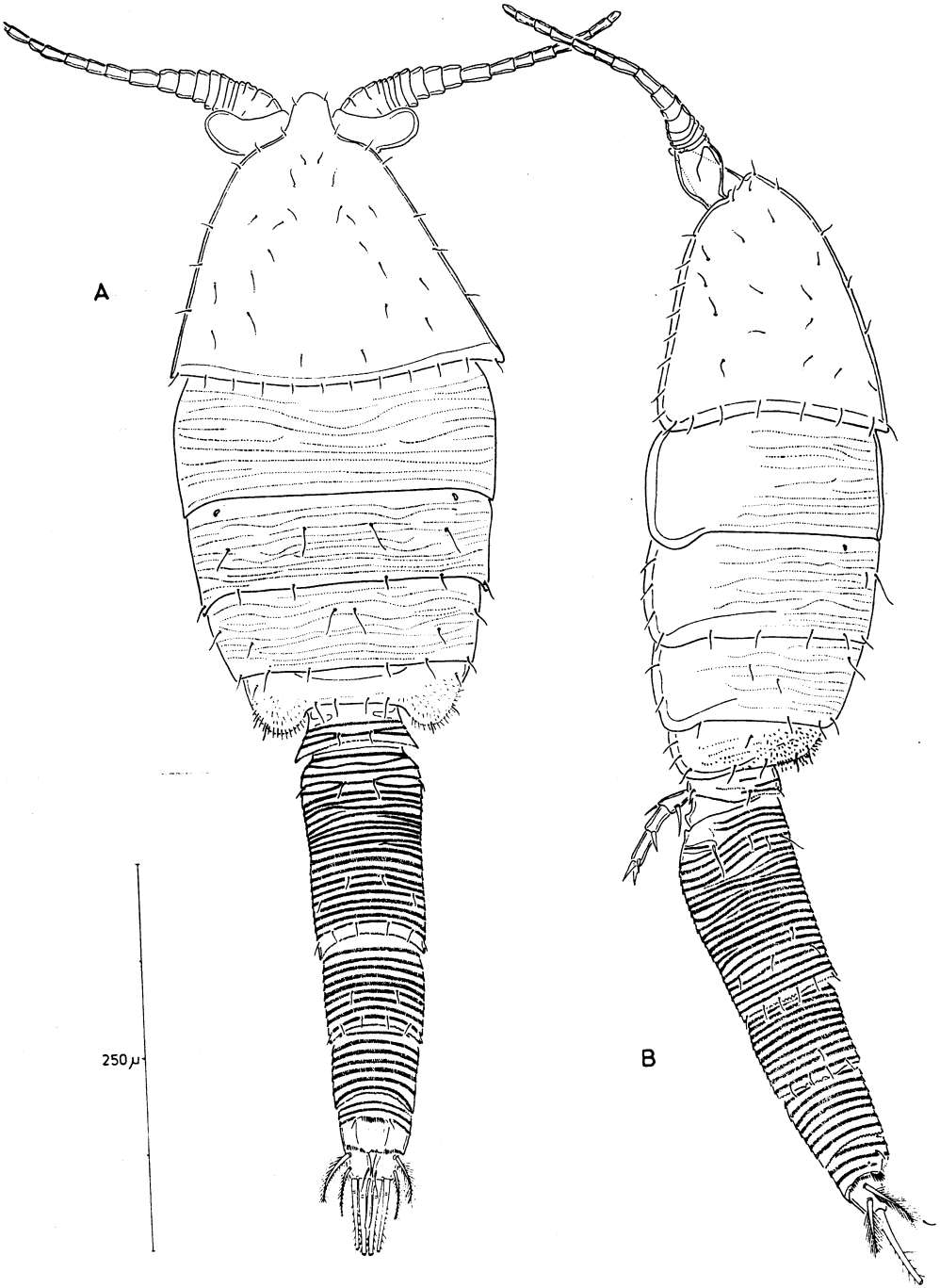

Fig. 1

Fig. 2

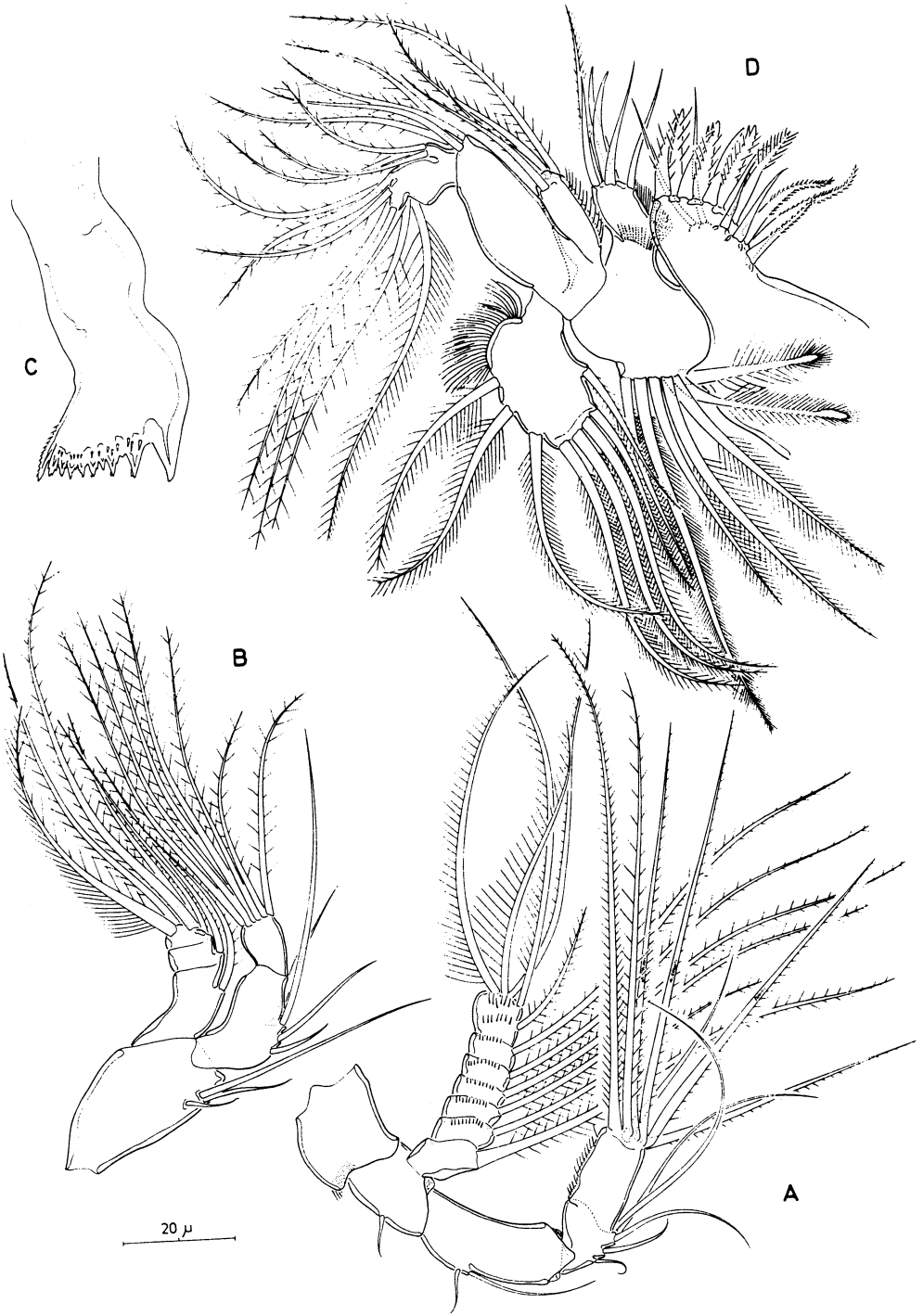

Fig. 3

Fig. 4

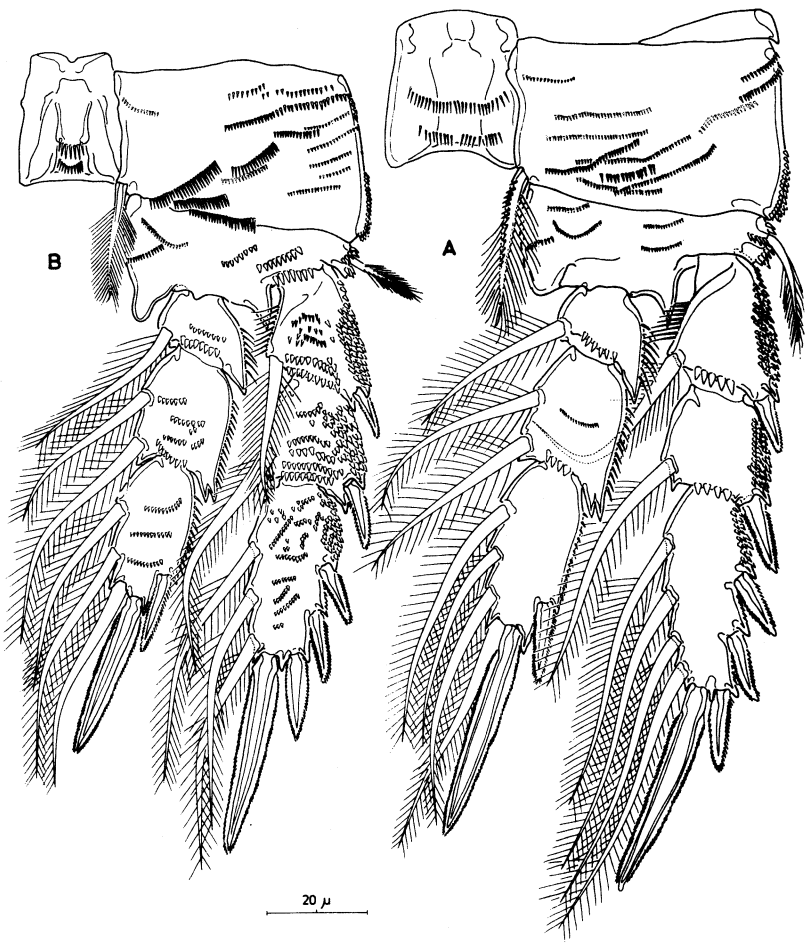

Fig. 5

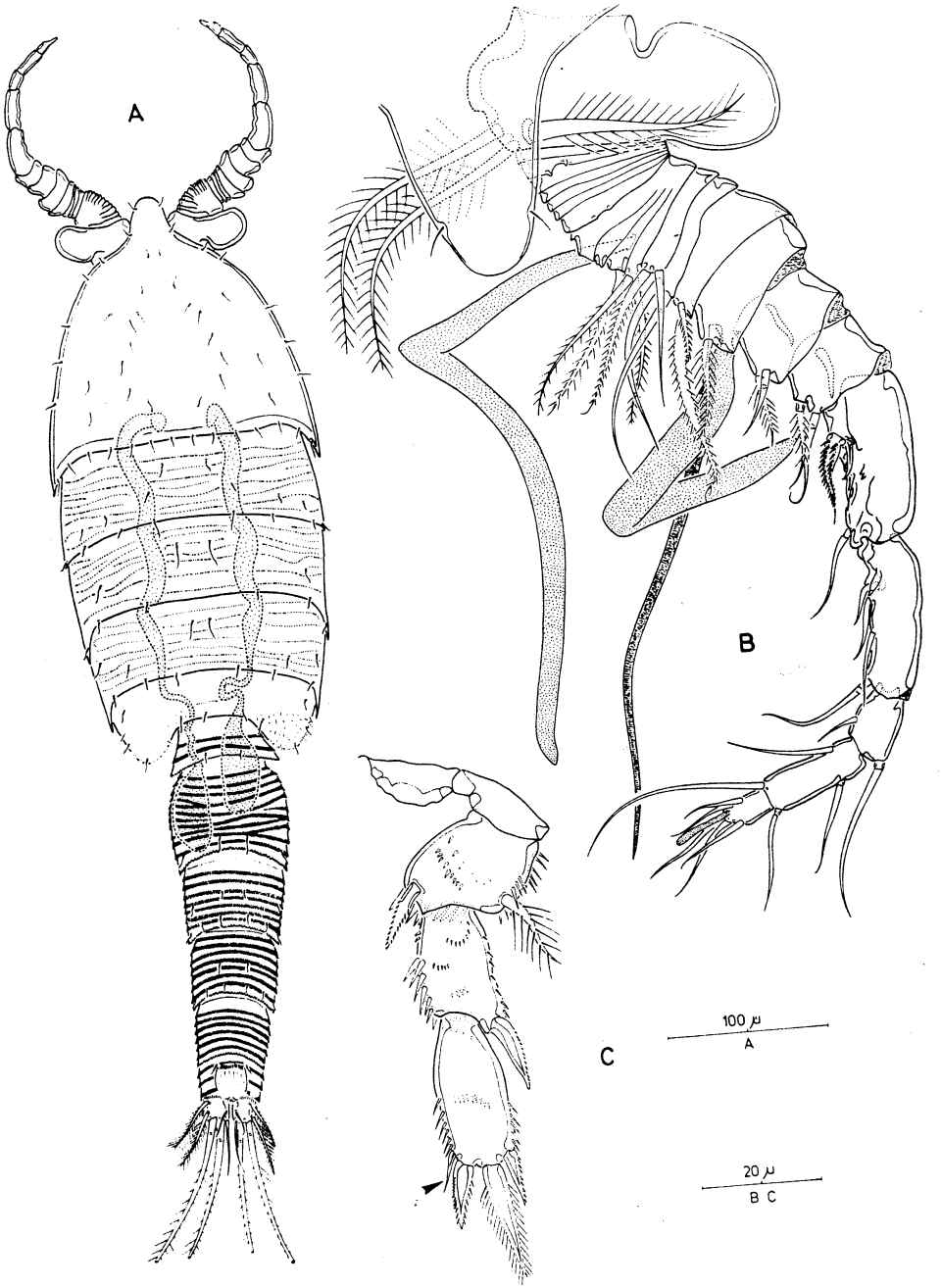

Fig. 6

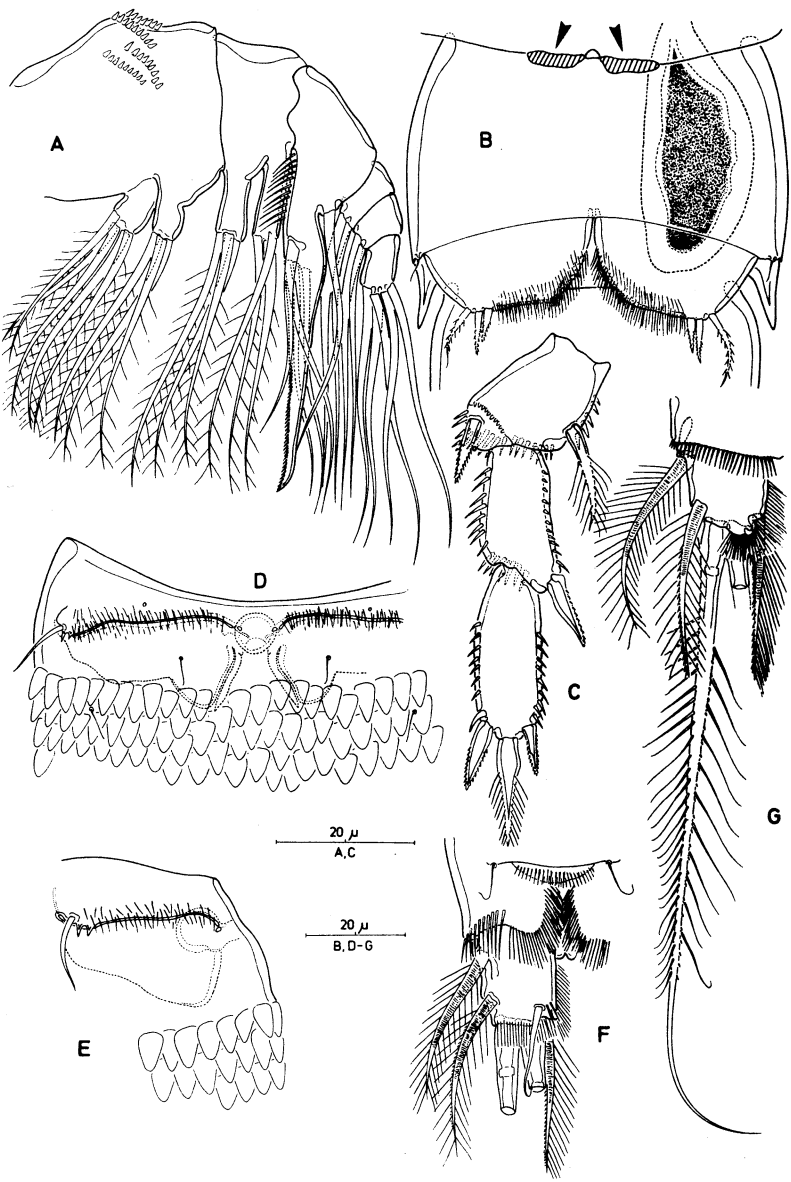

Fig. 7

Remarks

As a postscript I would like to stress the importance of accuracy. Every seta on an appendage in a misophrioid potentially has a homologue on the same appendage of a calanoid or harpacticoid. Setal counts and segment numbers are the database for subsequent phylogenetic studies and we must get them right. These drawings by Rony Huys show how well it can be done.

Geoff Boxshall
British Museum (Natural History)

Business ssenisuB

MONOCULUS-Library/Bibliography

With a certain delay the bibliography called "*MONOCULUS* Library-Stock 1988" has finally appeared. This delay has had a positive effect in that the number of entries has risen from 3,000 at the time of the London conference to more than 8,400 at the end of 1988. This was the number of publications held by the *MONOCULUS* Library at the end of last year. The Library keeps growing at a steady rate.

This is possible thanks to the donations by several colleagues who sent complete sets of their publications: Corkett, Hogans, Kazachenko, Marcotte. It is possible because of the arrival of reprints of recent publications which are listed below in the section on current literature. It is possible also due to our bibliography project in connection with the Crustacea Database which enables us to obtain copies of older literature through the library system in Germany.

There have been a few changes in the team of the *MONOCULUS*-Library/Bibliography. Anne Sitterle and Ove Breiholz have left. Barbara Hoesfeld has joined and has started to screen

Kiefer's reprint collection for titles not yet present in our library. Frieda Rötterink's contract could be extended for another year which is very beneficial to the further development of the library.

Due to these favourable circumstances the volume on the "*MONOCULUS* Library-Stock 1988" contains on its 452 pages immensely more entries than could be expected. The volume has been sold already to those who in London had put their names down on a list and to those who had signalled their interest by letter. About 15 copies are left and can be purchased at a price of US $ 10.00 (covering production and mailing). First come, first serve. Please pay the sum into the WAC account and add "*MONOCULUS*-Library" so that we know that these are not your dues:
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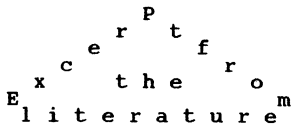

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My thanks are also due to Dr. C.H. Hudson and Mr. Rousselet for examining some doubtful specimens about which nothing definite can at present be said. Some interesting specimens, of which about half-a-dozen have been noticed, may, however, be briefly referred to. These little creatures, mountings of which I show to you, are evidently either rotifers or perhaps larval forms of some allied group. These mountings have been examined by many naturalists, but no one seems disposed to hazard a decided opinion about them. Mr. Rousselet, however, rather pointedly declines to accept them as rotifers without further evidence. And on the whole the most serviceable advice which I received is, "Catch some more and see what they are like when alive" - more easily said than done however.

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Den 29. Januar versetzte ich das ♀ auf ein neues Glas, indem ich ihr zwei ♂ als Gefährten beigebe. Am 1. Februar sehe ich, wie die ♂♂ das ♀ verfolgen und sich mit den ersten Antennen an den Furkalzweigen festklemmen. Es schüttelt sich energisch, ihren Copulationsversuchen Widerstand leistend, und es gelingt ihr in wenig Zeit, sich der Umklammerung zu entziehen. Die ♂♂, ihre Verfolgung fortsetzend, fassen das ♀ wenige Zeit später wieder, und der Kampf beginnt von neuem.
Leider kann ich dem Ausgange desselben nicht beiwohnen, da ich meinen Beobachtungsposten verlassen muss.

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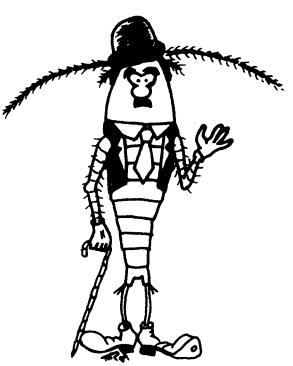

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