

AMPHIPOD NEWSLETTER

11



EDITED BY: Wim Vader, Tromsø Museum
PRODUCED BY: Les Watling, University of Maine

It is apparently unrealistic to aim at 2 issues of the newsletter each year; 3 in 2 years appears to be the maximum frequency I am able to manage. This time the main reason for the delay has been the time-consuming "index-project", the first installments of which form the main course of AN 11. I had not really expected any positive reactions to my request for volunteers for this tedious job, so I was very agreeably surprised to get a prompt offer for help from Dr. George I. Crawford in Northampton. Dr. Crawford has done virtually all the spadework for the index, while the department of Crustacea at the British Museum (Natural History) and the department of Zoology at Tromsø Museum have rendered clerical assistance.

If the present "index to genera and above" is met with approval by you (Please let us hear your comments), Dr. Crawford is willing to have a go at the "index to species" also. This is of course a still more formidable task and it is unlikely to become available before summer 1980, viz. in AN 13.

From mid July 1979 to mid August 1980 I shall be away from Tromsø, on sabbatical leave. Most of this year will be spent at Bodega Marine Lab., Bodega Bay, CA 94923, USA, where I shall work on the biology of amphipod-sea anemone associations, particularly that between the Lysianassid Allogausia recondita and the aggregating sea anemone Anthopleura elegantissima. I also intend to work for shorter periods at the Smithsonian Institution in Washington, and the National Museum of Natural Sciences in Ottawa, and hope to get a chance to visit also other "active amphipod centers", particularly colleagues who work on amphipod associations and intertidal ecology. My postal address throughout the year will be Bodega Marine Laboratory.

This newsletter again contains a list of "regional editors", the former regional collectors. They have got a more impressive-sounding title, in the hope that this may stimulate both themselves and their "subjects" not only to send their money to them, but also to act as clearing-houses for "news from colleagues", requests for information, and particularly also assistance with the bibliography.

This last will be especially important during 1979-1980, as the library facilities at Bodega Bay are meagre and will not allow me to carry on with the weekly two hours of scanning that has been the backbone of the bibliography-section hitherto. Les Watling has kindly offered to step in in this respect as far as possible, but also his department has an incomplete coverage of especially European literature. We must therefore ask you to please send your references (and reprints) to either Les or me,

Tromsø, 30. May 1979.


Wim Vader

Some additional notes:

The newsletter will be sent to subscribers outside of North America by air mail. I would appreciate hearing from you regarding the date of receipt of this newsletter which will be mailed on or before August 31, 1979.

The deadline for the next A.N. will be 1 February 1980.

I would like to remind everyone to send money and news to the regional editors or to myself or Wim Vader. The normal rate will be US \$3.00 for two issues, but donations are also very welcome.

Would you also check the address label to be certain it is accurate. If postal codes are used in your country and they are not on your label please send the appropriate postal code to me. This will greatly minimize (but probably not insure) the loss of your A.N.

Past newsletters for the following persons have been returned:
W.B. Rhoads, Georgia, USA; Henk Dennert, Holland; Yih-Min Wang, Taiwan.
If anyone knows their correct address please let me know.

The cover for this issue is courtesy of Dr. Manolo Ortiz of Cuba. Additional contributions are needed for future issues. They may be serious or humorous but the size should be equivalent to the present design.


Les Watling

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(It would be nice to have regional editors also for France, Germany and the USSR).

FORTHCOMING AMPHIPOD SYMPOSIUM POLAND 1980.

Fifth international colloquium on Gammarus and Niphargus and third international symposium on groundwater ecology Łódź- Częstochowa, Poland - september 1980.

1st Circular Letter

Dear colleagues,

We are glad to inform you that according to the wish of many participants of our previous combined meeting in Schlitz and Blacksburg the successive conference will be held in Poland. The place of this meeting will be probably Burzenin near Łódź and the program will include also visit to Częstochowa.

We invite you cordially to our country in early fall 1980/most probably 7-13 September/hoping that daily costs of the stay in Poland will be not higher than those during the previous colloquia.

The registration fee should be prepaid to: Bank Handlowy, ul. Traugutta 7/9, 00-067 Warszawa, R-k nr 342-1516-787, for: Min. N.Sz.W.T., Uniwersytet Łódzki, Komitet Organizacyjny V Int. Coll. Gammarus. Registration fee is U.S.A. \$ 35 when sent prior to 31 March 1980 and \$ 40 after that date.

The tentative program of the conference is following: a/3 days in Burzenin- presenting the papers, b/field excursion Burzenin-Kazimierz-Częstochowa with sampling amphipods and groundwater fauna/2 days/, c/ field excursion Częstochowa- Ojców National Park- Częstochowa/ 1 day/. Informal discussion sessions, depending on the proposals and on the number of papers presented, will be held at the evenings in Burzenin or in Częstochowa.

This circular letter is being sent to over 330 of our colleagues according to the list obtained by the courtesy of the Blacksburg meeting organizers and supplemented with some new addresses. Please ask persons that would be interested in receiving circular letters to contact one of us. If you are interested in receiving further circular letters please fill out and return a preliminary application

form until the end of October 1979. The deadline for receipt of the abstracts will be April 30, 1980.

Next circular letter will be sent in November 1979.

With best regards

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(The preliminary application form asks for name, address, whether you wish to attend, whether you wish to present a paper (and if yes, its title), and if you have any suggestions for topics for "informal discussion sessions". W.V.)

REQUESTS FOR INFORMATION

Leucothoe inside bivalve molluscs

Dr. Brian S. Morton (Hong Kong) has recently found a leucothoid amphipod in the mantle cavity of the extremely rare (and now probably extinct) bivalve Pholadomya candida. The specimen was collected nearly 150 years ago in the Danish West Indies, and belongs to the Univ. of Copenhagen. The amphipod has been sent to me. It is surprisingly well conserved and is a representative of the genus Leucothoe, one of those species with rectangular posterior border of ep. 3 and a very short dactyl on gn. 1.

I know of only a single previous record of Leucothoe species in bivalve molluscs, viz. that of Ortiz (1975. Invest. mar. cienc. 8 (16), 1-12), who found L. spinicarpa in Lima scabra and Atrina rigida. On the other hand, available records seem to show a low host-specificity for many Leucothoe species, and L. spinicarpa has been found in a variety of hosts: tunicates, sponges, brachiopods, sea-anemones, echinoderms and molluscs (cf. Vader 1979, Astarte 11, 123-136). Also, the taxonomy of Leucothoe is in a state of flux, and many undescribed species occur, also in the Caribbean (J. Thomas, unpublished). I am therefore very hesitant to erect a new species on

the basis of a single specimen, and should like to come in contact with colleagues, who are working on Leucothoe taxonomy and biology, especially in the tropical and subtropical Atlantic. I shall also be very grateful for published or unpublished records of the occurrence of leucothoids in molluscs, brachiopods and sea anemones. If some of you are describing new species in the group to which the present specimens belongs, the Copenhagen Museum will no doubt be interested in having the present specimen included in such a study.

Amphipods and Sea Anemones

During my sabbatical year in California I shall mainly work on amphipod- sea anemone associations, and one of my aims is to write an extensive review of the occurrence and biology of such associations throughout the world, based on the literature and my own studies in Norway and California. In this connection I should greatly appreciate receiving published and especially unpublished data and observations on the occurrence of such associations.

Wim Vader
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Bodega Bay
CA 94923, USA

We would like to request that anyone who has made collections of amphipods from any type of seagrass habitat anywhere in the world send us a list of the species collected. Roger Zimmerman and I are interested in comparing the major genera of amphipods found in seagrass habitats worldwide. We have reasonable information for the U.S. east coast and the Carribean but would be grateful for additional information from these areas as well as others. Species lists may be sent to either:

Dr. Roger Zimmerman
Center for Energy & Environmental Research
University of Puerto Rico
College Station
Mayaguez, P.R. 00708

Dr. Walter Nelson
Harbor Branch Institution
RR-1, Box 196-A
Ft. Pierce, FL 33450

I am currently doing a series of SEM studies on species of Gammarus. If anyone is currently doing any rearing or in-lab experiments with G. zaddachi, G. pulex, G. locusta or G. salinus and could spare a few recently-molted individuals, I would appreciate having them ("recently" means within a day or so, to insure a reasonably clean cuticle). Ideally, I would prefer mature ♂♂ and ♀♀, formalin fixed for at least 24 hrs., rinsed several times with distilled H₂O and them transferred to 50% ethanol.

Heather Holman
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News from Colleagues

Stephen Petrich: My work with amphipods over the last 3 years has centered on their occurrence and importance in marine fouling communities with emphasis on the systematics of the local fauna. Presently, I am working on biofouling problems under a contract with the Southern California Edison Company.

Kelly Duncan: On terrestrial amphipods - a disease (caused by the bacterium Bacillus subtilis) is sweeping through one population decimating it as it goes. Makes a nice study of a naturally occurring pandemic. I have also discovered that I can keep terrestrial amphipods alive on nothing but filter paper. Fun for me, but not, I guess for them. They lose body pigmentation except for the blue haemocyanin tint. But the proteins that normally carry the carotenoid pigments are still present in the haemolymph at normal concentrations.

Ms. Leslie J. Snider: I am a graduate student at Scripps Inst. Oceanography... am working on the dispersal of amphipods from kelp holdfasts (Macrocystis pyrifera).

Helmut Koch: I am currently investigating some of the amphipod fauna of the shallow nearshore waters of the western Beaufort Sea in Alaska, in conjunction with the Outer Continental Shelf Environmental Assessment Program.

Kris Thoenke: I am now a post-doc with Dr. David C. White at Florida State University. Dr. White, his graduate students and technicians and I are looking at the effects of offshore oil drilling platform discharge on the microbial community and how this effects the behavior and physiology of amphipods.

Mike Dadswell: Currently analysing the amphipod communities of Northumberland Strait, Gulf of St. Lawrence.

Laura Richards: Foraging behaviour of Orchestoidea californiana and its beetle predators.

Noel Hynes: Spent six months collecting stoneflies and, incidentally, amphipods in Tasmania, where he was much impressed with the variety of freshwater species.

Eric Mills: Currently diverted from amphipods to ecosystem research.

David J. Wildish: I have just returned frm an interesting year in Aberdeen spent working in the Microbiology Department, University of Aberdeen. At St. Andrews two projects are underway: forest pesticide side-effects on freshwater microbiology and assessment of biological effects of a proposed Bay of Fundy tidal power project. The latter is

multidisciplinary involving many individuals from local University and government labs. My particular niche in this program, with collaborators Mike Dadswell of the St. Andrews Lab, and Don Peer of the Marine Ecology Lab, Halifax, is to produce a sublittoral benthic production map of the whole of the Bay. We have already mapped the summer biomass of the Bay and are now attempting to sample some stations monthly to determine production of individual dominant species such as *Haploops* sp., *Caseo bigelowi*, *Photis reinhardi* and *Harpinia propinqua*. I would welcome information from anyone working on, or sampling, these species.

Pierre Brunel: Since May 1978, I have two new graduate students working toward their M.Sc. on amphipods: Bernard Sainte-Marie and Gabriel Lamarche. They have been sampling an amphipod community at a monitoring station (Lower St. Lawrence (Estuary)) which had been studied from May to October 1970 and 1971 by Michel Besner, and sampled further in the same way in 1972 and 1973, using our improved Macer-GIROQ suprabenthic two-level sled (description in press in the *Internationale Revue der gesamten Hydrobiologie*). Sampling has been done this time mainly for life-cycle and breeding season studies on the dominant species, from June to November 1978, and we have added samplings with Hessler-Sanders' epibenthic sled. Each student is starting with a species well represented both in the Lower St. Lawrence and in the Baie des Chaleurs ecosystem, which differ in primary production regimes, but the bottom communities being studied are very similar, over mud in the cold-layer at a depth of 120 metres. The first two species selected are *Arrhis phyllonyx* (Oedicerotidae) and *Anonyx pacificus*, and the extensive time-series samples of four years in each ecosystem which we had collected in 1968-73 will be used in addition to the 1978 material.

Max Dunbar: My own amphipod activities are limited to amphipods of the Gulf of St. Lawrence water and Labrador current water in the Northeastern Gulf, and to an essentially bibliographic study of the fauna associated with diatoms in sea ice in Arctic and Antarctic regions where the same herbivore niches have been filled by different groups of crustacean, including amphipods.

Ed Bousfield: Current activities relating to amphipod research include:

1. Continued preparation of an illustrated guide to amphipods of the Pacific coast of Canada and contiguous regions. About 400 species will be fully treated (whole-mount line illustrations, colour photographs and keys) of which more than 100 have been completed to date. New taxa are being prepublished on a superfamily basis.
2. Refinement of concepts and inter-relationships. Recent field work in New Zealand and southeastern Australia yielded valuable specimens of terrestrial, freshwater, estuarine and intertidal sand-burrowing groups from which important features of sexual dimorphism, gills and brood-plates and antennal calceoli can be determined and superfamily placement more reliably made. Especially encouraging is the energy and enthusiasm of regional amphipod taxonomists in tackling this large fauna, much of it still unworked, on a systematics-ecology basis. For these ongoing studies on phylogeny, the writer would welcome the deposition of worldwide, generically representative, material in the Canadian National Collection that now numbers approximately 75,000 lots.

Wolfgang Zeidler: I am currently working on the amphipod fauna of Southern Australia. For the past two years I have been trying to obtain a copy of J.L. Barnard, 1969; "The families and genera of marine gammaridean amphipod." (U.S. Nat. Mus. Bull. 271:1-535) but without success. Our library does not have a copy and the only copy available to me is in the University library and I can only borrow that one week at a time - not very satisfactory. I am now getting desperate and wonder if I could send out a cry for help via the next newsletter. I am prepared to buy anyone's second copy if they have one or perhaps someone knows of a copy that is not likely to be used that I may be able to purchase. Alternatively I offer for exchange, duplicates of papers from our museum library. Some of the longer works of which I have good duplicates are listed separately below:

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- Chilton, C. 1912. The Amphipoda of the Scottish National Antarctic Expedition. *Trans. Roy. Soc. Edinburgh* 48(2):454-520, 2 plates. 1921. Fauna of the Chilka Lake - Amphipoda. *Mem. Ind. Mus.* 5:521-558.
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- Haswell, W.A. 1882. Catalogue of the Australian stalk - and sessile-eyed Crustacea. *Aust. Mus. (Syd.) Publ.* 1-326 pp., 4 plates.
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- Stephensen, K. 1929. Zoology of the Faroes - Marine Crustacea, Amphipoda. 1-40.]

New Subscribers

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Walter Nelson: Abstract of Dissertation

The community ecology of seagrass amphipods: predation and community structure, life histories, and biogeography.

Amphipod crustaceans constitute a significant component of seagrass ecosystems. As lower trophic level elements, ecological theory suggests that predation may be relatively more important in regulating amphipod abundances and controlling their interactions than competition. An attempt was made to examine this hypothesis in detail for the amphipods of eelgrass (Zostera marina) habitats near Beaufort, N.C., and to compare these results with those found for amphipod communities of other seagrass systems.

To evaluate the predation hypothesis, the following program was carried out: 1) extensive field sampling was carried out in two eelgrass beds to determine the seasonal and spatial pattern of abundance and diversity of amphipod prey and their predators, 2) field predator exclusion and inclusion experiments were performed, and 3) laboratory predation experiments were performed to examine the prey preferences of major predators. The importance of competition was examined by 1) examining matrices of correlation coefficients of all common species for negative values, 2) examining gut contents of 5 common species for degree of food overlap, and 3) by performing laboratory competition experiments with three common amphipod species.

Results show little evidence for competition. On the other hand, strong evidence for the importance of predation was recorded. Sampling data indicate that amphipod abundances undergo strong seasonal fluctuations, with the maximum rate of decrease occurring in the spring, the period during which juvenile fish predators are present in maximum abundances in the estuary. Significant decreases in amphipod abundances occurred in a fish inclusion experiment, indicating fish are capable of generating the observed decreases in amphipod abundances. Amphipod densities decreased in fish exclusion experiments, possibly due to predation by decapod crustaceans which were protected by the cages from their own predators.

Extension of sampling to other study sites and seagrass species along a latitudinal range again indicated predation to be a possibly significant factor controlling seagrass amphipod communities. Results suggest that in seagrass beds at more southerly latitudes where large numbers of predatory fish species are present, there are fewer amphipod species lacking some form of predator avoidance mechanism relative to areas of less severe predation.

A comparison of the biology of epifaunal and infaunal species reveals differences in seasonal patterns of variation in mean population body size and egg size between the two groups which indicate that predation may act in a differential manner depending on amphipod habits.

The predation hypothesis, therefore, satisfactorily explains a variety of aspects of amphipod distribution, seasonality, and community composition, as well as being implicated in several aspects of individual species biology.

BIBLIOGRAPHY

As usual I have received invaluable help from Claude De Broyer, Iraida Greze and Jan Stock in the compilation of this bibliography. I am also as always most grateful to those of you who have sent me reprints. As noted in the "editorial" of this newsletter, such assistance will be still much more necessary during the coming year, although Les Watling and I will do our best to maintain the present standard of only moderate incompleteness.

Some colleagues have asked me why the bibliography is always divided into 3-4 pieces, with consequent loss of clarity. The reason is simply that I want to spread the considerable work involved somewhat more evenly over the year. I hope that you will bear over with this also in future.

Roger Lincoln's eagerly awaited book on British shallow-water amphipods will appear this summer and will be reviewed in AN 12. I also should much like to have reviews of Greze's and Tzvetkova's monographs, and herewith challenge our Russian-speaking colleagues to furnish such reviews for AN 12. Also the review of Jensen's book must wait until AN 12.

A new type of identification key

While scanning the reference journal Oceanic Abstracts for amphipod literature, my attention was drawn to an abstract of a paper by McKinney, Kalke & Holland in Contr. mar. Sci. 21 on "New species of amphipods from the western Gulf of Mexico". According to this abstract "Keys to the unknown species of Parametopella, Netamelita, and marine Eriopisa are provided".

This is indeed a most promising development. One may hope that the authors will be enabled to proceed along these lines, finishing up with a comprehensive key to all unknown marine amphipods. (W.V.)

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- IVLEVA, I.V., 1977. (Metabolism levels in crustaceans living at low temperatures). ____ Trudy Vses. Hidrobiol. ob-va 21, 197-230. (In Russian. The rate of metabolism was studied in Crustacea, especially "Gammarus oceanicus L." and Gammarellus carinatus from reservoirs with different conditions of water-temperature. The characteristics of curves of metabolic rate as a function of temperature are established for different cold-water organisms)
- JONES, D.A., A.R.G. PRICE & R.N. HUGHS, 1978. Ecology of the high saline lagoons Dowhat as Sayh, Arabian Gulf, Saudi Arabia. ____ Est. coast. mar. Sci. 6, 253-262 (i.a. Urothoe grimaldii)
- x JUST, J., 1978. Taxonomy, biology and evolution of the circumarctic genus Acanthonotozoma (Amphipoda) with notes on Panoploeopsis, ____ Acta arctica 20, 1-140 (An important monograph, the author's D. Sc. thesis for Copenhagen University. A. sinuatum, A. gurjanovae, A. magnum and A. dunbari are described as new species, bringing the total number to 9. The author has studied fecampiid and choniostomatid parasites of Acanthonotozoma spp., and gives an extensive and most valuable discussion of the evolutionary history and distribution of the genus as well as data on breeding strategy).

- KAMENSKAYA, O.E., 1977. (Amphipods in the fouling of hydrotechnical constructions in the Sea of Japan) ____ Biol. Morya (Vladivostok). 5, ? (In Russian, not seen. Twenty spp. recorded)
- V KARAMAN, G.S., 1977. Contributions to the knowledge of the Amphipoda 81. Revision of the genus Carinurus Sov. 1915 from Baikal Lake (fam. Gammaridae). ____ Poljoprivreda i Šumarstvo 13, 33-52 (Bazikalova's forms A-C of C. reissnerii are given specific rank and described as C. amentatus, C. bifrons and C. bazikalovae n. spp. A key to the 11 recognized species is provided)
- KORYAKOV, E.A., 1977. (Night concentrations of makroplankton in epilimnion). ____ Trudy limnol. Inst. Sibirs. otdel. Akad. Nauk SSSR 19 (39), 98-105 (In Russian. Data on night concentrations, biomass and stock of the pelagic amphipod Macrohectopus branickii in Lake Baikal).
- KOUMJIAN, L. & I. VALIELA, 1978. The effect of secondary plant substances on grazing of some salt marsh herbivores. ____ Biol. Bull. 155, 449 (i.a. Orchestia grillus. Abstract only)
- KUDRJASHOV, V.A. & A.Yu. ZVJAGINTSEV, 1978. (Amphipod Crustaceans: composition and distribution in the fouling of natural substrates in the tidal zone of the Tauysk Gulf, the Okhotsk Sea) ____ Trans. Inst. mar. Biol., Vladivostok 3, 137-166. (In Russian. Deals with 32 intertidal amphipod spp., their ecological distribution and their zoogeographical position)
- LAUTENSCHLAGER, K.P. & N.K. KAUSHIK, 1977. Consumption of leaf microflora by Gammarus. ____ S.I.L. 20 Congr., Copenhagen, (Not seen)
- LAUTENSCHLAGER, K.P., N.K. KAUSHIK & J.B. ROBINSON, 1978. The peritrophic membrane and faecal pellets of Gammarus lacustris limnaeus Smith. ____ Freshw. Biol. 8, 207-211.
- LAVAL, Ph., 1978. The barrel of the pelagic amphipod Phronima sedentaria (Forsk.) (Crustacea: Hyperiididae). ____ J. Exp. mar. Biol. Ecol. 33, 187-211. (The barrels come from salps and pyrosomes).
- x LEE, W.Y., 1977. Some laboratory cultured crustaceans for marine pollution studies. ____ Mar. Poll. Bull. 8, 258-259 (i.a. Amphithoe valida)
- x LEE, W.Y. & J.A.C. NICOL, 1978. The effect of naphthalene on survival and activity of the amphipod Parhyale. ____ Bull. environm. Contam. Toxicol. 20, 233-240.
- LEWIS, M.H., 1976. Amphipoda. ____ Pp. 167-182 in A. Chapman & M. Lewis. An introduction to the freshwater Crustacea of New Zealand. Collins, Auckland & London, 261 pp (13 spp are dealt with).

- MAGNIEZ, G., 1978. Précopulation et vie souterraine chez quelques Péracarides (Crustacea, Malacostraca). ____ Arch. Zool. exp. gén. 119, 471-478 (In anophthalmous hypogean peracarids, the precopulatory nuptial rides have either become much longer than normal, or have completely disappeared).
- x MEYERING, M. & W. TEICHMANN, 1978. Zeitpläne limnischer Gammariden unter naturnahen Bedingungen. ____ Verh. Ges. Ökol. 7 (Kiel 1977), 191-199 (Gammarus fossarum in cages in small rivers moult more frequently than those kept under constant conditions in the lab; moulting frequency is influenced by varying temperature).
- MOORE, J.W. & I. A. MOORE, 1976. The basis of food selection in flounders Platichthys flesus (L.) in the Severn estuary. ____ J. Fish Biol. 9, 139-156 (Feeds on Gammarus salinus in Febr.-April)
- NEALE, J.W., 1978. A re-investigation of Scott's Pontocypris ? hyperborea (Ostracoda) from Franz Joseph land. ____ Crustaceana 34, 69-75 (A senior synonym of Acetabulastoma littorale littorale Schornikow, an obligate associate of gammarids.)
- NELSON, W.G., 1978. An occurrence of Heterophlias seclusus Shoemaker, 1933 (Amphipoda, Phliantidae) at Beaufort, North Carolina, USA. ____ Crustaceana 35, 103.
- x OPALINSKI, K.W. & K. JAŹDŹEWSKI, 1978. Respiration of some antarctic amphipods. ____ Pol. Arch. Hydrobiol. 25, 643-655 (Data on Parathemisto gaudichaudii, Parandania boeckii, Byblis securiger, Eusirus perdentatus, Cyphocaris richardi and Eurythenes gryllus)
- x ORTIZ, M., 1976. (A new amphipod from Cuban waters (Amphipoda, Gammaridea, Phliantidae). ____ Cienc. Ser. 8, Invest. mar. (Havana) 25, 21-36 (In Spanish. Heterophlias seticoxa n.sp.)
- x ORTIZ, M., 1976. (Some characteristics of the Cuban benthos). ____ Cienc. Ser. 8, Invest. mar. (Havana) 22, 1-32 (In Spanish).
- PERCY, J.A. & J.A. WALBRIDGE, 1978. Seasonal changes in organic composition and caloric value of an arctic marine amphipod, Onisimus (= Boeckosimus) affinis. ____ Data Rep. Fish. mar. Serv. 46, 32 pp. (? 0701-7634). (Not seen)
- PIEARCE, T.G. & M. COX, 1977. The distribution of unpigmented and pigmented Gammarus pulex in two streams in northern England. ____ Naturalist, Hull 102, 21-23 (Not seen).
- PONOMAREVA, Z.A., 1978. (Heat resistance of some amphipods in the Caspian complex of Dniepr and Kaunas water reservoir). ____ Zool. Zh. 57, 610-613 (In Russian. No physiological changes in heat resistance were registered as a results of acclimatization in Pontogammarus robustoides and P. crassus)

- RACHOR, E. & S.A. GERLACH, 1978. Changes of macrobenthos in a sublittoral sand area of the German Bight, 1967 to 1975. _____ Rapp. P.-V. Réun. Cons. int. Explor. Mer 172, 418-431.
- RUBER, E. & R. KOCOR, 1976. The measurement of upstream migration in a laboratory stream as an index of potential side-effects of temephos and chlorpyrifos on Gammarus fasciatus (Amph. Crust.) _____ Mosquito News 36, 424-429.
- SEMENCHENKO, V.P. & V.S. SARVIRO, 1977. (The effectiveness of food utilization on the growth of Gammarus lacustris Sars) _____ Dokl. Akad. Nauk. BSSR, Minsk 21, 376-377 (In Russian, not seen)
- SHILLAKER, R.O. & P.G. MOORE, 1978. Tube building by the amphipods Lembos websteri Bate and Corophium bonnellii Milne Edwards. _____ J. exp. mar. Biol. Ecol. 33, 169-185.
- SHULENBERGER, E., 1977. Hyperiid amphipods from the zooplankton community of the North Pacific central gyre. _____ Mar. Biol. 42, 375-385 (83 species, none endemic for the gyre)
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- SPEHAR, R.L., R.L. ANDERSON & J. T. FIANDT, 1978. Toxicity and bioaccumulation of cadmium and lead in aquatic invertebrates. _____ Environm. Poll. 15, 195-208 (i.a. Gammarus pseudolimnaeus)
- STALMAKOVA, G.A., 1977 (On bioecological characteristics of some benthic species of crustaceans of Lake Ladoga). _____ Izv. Nii ozern. i. rechnogo rybkhoz. 111, 103-113. (In Russian. The reproduction of Asellus aquaticus, Gammarus lacustris and Pontoporeia affinis was studied and their potential production calculated.)
- SUTCLIFFE, D.W., 1978. Water chemistry and osmoregulation in some arthropods, especially Malacostraca. _____ Ann. Rev. Freshw. biol. Ass. 46, 57-69 (Not seen)
- TASHIRO, J.E., 1978. Comparison of Eupronoe armata Claus, 1879, and Eupronoe intermedia Stebbing, 1888 (Amphipoda, Hyperiidea). _____ Crustaceana 34, 76-82 (Both are valid species).
- THAYER, A. & E. RUBER, 1976. Previous feeding history as a factor in the effects of temephos and chlorpyrifos on migration of Gammarus fasciatus. _____ Mosquito News 36, 429-432.
- TZVETKOVA, N.L., 1977. (New genus and new species of amphipods (Amphipoda: Corophioidea) from the Japan Sea. _____ Akad. Nauk. SSSR, Zool. Inst. Leningrad, Explor. Sea USSR 21 (29), 88-101. (In Russian. Pareurystheus n.gen. (Isaeidae), type Eurystheus anamae. Further species: P. gurjanovae } _____

n.sp.(=dentatus s. Gurj. 1951), P. latipus n.sp., Eurystheus sexdentatus and E. gurvitzii.)

V VASSILENKO, S.V., 1977. (A new species of amphipod Caprogammarus micropleopodus (Amphipoda, Caprogammaridae) inhabited on the shore of the Kuril Islands) ____ Akad. Nauk SSSR, Zool. Inst. Leningrad, Explor. Seas USSR 21(29), 60-66 (In Russian).

VERHEYEN, F.J., 1978. Orientation based on directivity, a directional parameter of the animal's radiant environment. ____ Pp 447-458 in K. Schmidt Koenig & W.T. Keeton (Eds.) Animal migration, navigation, and homing. Springer Verlag, Berlin, Heidelberg, N.York.

VEROLLET, G. & H. TACHET, 1978. Un échantilleur à succion pour le prélèvement du zoobenthos fluvial. ____ Arch. Hydrobiol. 84, 55-64.

WOLFF, T., 1977. Diversity and faunal composition of the deep-sea benthos. ____ Nature, Lndn 267, 780-785.

ZAKUTSKII, V.P. & F.A. OLEINIKOVA, 1977. (Pontogammarus of the Sea of Azov.) ____ Rybnac Khozyaistvo 10, 27-28 (In Russian. Abundance (25-170.000 p.m²) and biomass (140-1000 g/m²) of Pontogammarus maeoticus were determined. Annual production in the Azov Sea in wet weight is c. 1000 tons.

ZERBIB, C. 1976. Nature chimique des enclaves vitellines de l'ovocyte du Crustacé Amphipode Orchestia gammarellus (Pallas). ____ Ann. Histochem. 21, 279-295.

ZERBIB, C., 1977. Endocytose ovocytaire chez le Crustacé Amphipode Orchestia gammarellus (Pallas). Demonstration par le peroxydase. ____ C.R. Acad. Sc. Paris 284 D, 757-760.

* ZIEGELMEYER, E., 1978. Macrobenthos investigations in the eastern part of the German Bight from 1950 to 1974. ____ Rapp. P.V. Réunion. Cons. int. Explor. Mer 172, 432-444.

- X ANDRES, H.G., 1978. Liagoceradocus acutus sp.n., ein Gammaride aus der Jameos del Agua auf Lanzarote (Amphipoda, Crustacea). ___ Mitt. hamb. zool. Mus. Inst. 75, 249-253.
- < ANGER, K., 1977. Benthic invertebrates as indicators of organic pollution in the western Baltic Sea. ___ Int. Rev. ges. Hydrobiol. 62, 245-254.
- X BARNARD, J.L., 1978. Redescription of Plioplateia K.H. Barnard, a genus of amphipod (Crustacea) from South Africa. ___ Ann. S. Afr. Mus. 77, 47-55. (The new family Plioplateidae (recte: Plioplateiidae) is erected for the monotypic Plioplateia triquetra,
- X BARNARD, J.L. & M.M. DRUMMOND, 1978. Gammaridean Amphipoda of Australia, part III. The Phoxocephalidae. ___ Smithson. Contr. Zool. 245, 1-551. (A monumental monograph. It is most unfortunate that it is a few months predated by Gurjanova's first paper in her proposed series on the same family (see p. 14), because of the nomenclatorial uncertainty this has created. Barnard and Drummond have divided the family in 9 subfamilies: PONTHARPINIINAE (with as only genus and species Pontharpinia pinguis); TIPIMEGINAE (type genus Tipimegus n.gen.) with Tipimegus thalerus n.sp. (type), T. dinjerrus n.sp., T. kangulun n.sp., T. kalkro n.sp. and T. stebbingi (was Paraphoxus), Booranus n.gen., B. weemus n.sp. (type), B. tikeri n.sp., B. wangoorus n.sp., Trichophoxus (only species T. capillatus) and Waitangi (only species W. rakiura); BROLGINAE (type genus Brolgus n.gen.), with Mandibulophoxus, Cunmurra n.gen., C. itickerus n.sp. (type), Brolgus n. gen. (type Paraphoxus tattersalli), B. millinus n.sp., B. mahmak n.sp., B. tavelus n.sp., B. koongarrus n.sp., Elpeddo n.gen. (only species E. kaikai n.sp.). Ganba n.gen. (only species G. pellati n.sp.), Kuritus n.gen. (only species K. nacomus n.sp.), Wildus n.gen., W. thambaroo n.sp. (type), W. mullokus n.sp., W.?fuegiensis (Schellenberg), Wildus?waipiro (J.L. Barnard), Paraphoxus (with P. oculatus and possibly P. simplex the only species left here); LEONGATHIINAE, with Leongathus nootoo n.gen. n.sp. as only representative; JOUBINELLINAE (type genus Joubinella), Matong n.gen. (only species M. matong n.sp.), Kotla n.gen. (only species K. batteri n.sp.), Yammacoona n. gen. (only species Y. kunarella n.sp.); PARHARPINIINAE (type genus Parharpinia), P. villosa, P. warte n.sp., Protophoxus australis; BIRUBIINAE (type genus Birubius), Birubius (type B. panamunus), B. lorus n.sp., B. nammuldus n.sp., B. myallus n.sp., N. apari n.sp., B. cartoo

n.sp., B. thalmus n.sp., B. muldarpus n.sp., B. gallangus n.sp., B. mayamayi n.sp., B. wirakus n.sp., B. chintoo n.sp., B. karobrani n.sp., B. booleus n.sp., B. babanukus n.sp., B. gelarus n.sp., B. quearus n.sp., B. narus n.sp., B. gambodeni n.sp., B. maamus n.sp., B. lowannus n.sp., B. kyeemus n.sp., B. batei (was Phoxus batei), B. kokorus n.sp., B. kinkus n.sp., B. munggai n.sp., B. ularitus n.sp., B. eleebanus n.sp., B. jirrandus n.sp., B. yorlunus n.sp., B. eake n.sp., B. kabbulinus n.sp., B. taldeus n.sp., B. yandus n.sp., B. maldus n.sp., B. wulgaru n.sp., Yan n.gen., Y. tiendi n.sp. (type), Y. errichus n.sp., Tickalerus n.gen. (only species T. birubi n.sp.), Kulgaphoxus n.gen., K. borralus n.sp. (type), K. cadgeeus n.sp., Microphoxus (only species M. minimus), Metharpinia (only species M. longirostris, as M. cornuta is removed to a new genus to be described by Barnard); PHOXO-CEPHALINAE (type genus Phoxicephalus), P. bassi, P. kukathus n.sp., P. tunggeus n.sp., P. rupullus n.sp., P. burleus n.sp., P. keppeli n.sp. (= P. bassi s. K.H. Barnard 1930), Jerildaria n.gen. (only species Jerildaria joubiphoxus n.sp.), Leptophoxoides, Leptophoxus, Metaphoxus, M. tuckatuck n.sp., M. yaranellus n.sp., M. mintus n.sp., M. tulearensis n.sp. (= M. fultoni s. Ledoyer 1967) Metaphoxoides, M. zavorus n.sp., Diogodias n.gen. (type Metaphoxus longicarpus, further species Metaphoxus littoralis, M. platyrostris) Vasco n.gen. (only species Metaphoxus brevidactylus from Madagascar), Hopiphoxus n.gen. (only species Metaphoxus simillimus J.L. Barnard from Baja California), Rikkarus n.gen. (only species R. lea n.sp.), Japara n.gen. (only species J. papporus n.sp.), Kondoleus n.gen. (only species K. tekina n.sp.), Limnoporeia kingi, L. maranowe n.sp., L. yarrague n.sp., L. woorahae n.sp., L. ungamale n.sp., L. wakkine n.sp., L. kalduke n.sp., Uldanamia n.gen. (only species U. pillare n.sp.); HARPINIINAE, with Coxophoxus, Basuto n.gen. (only species Pontharpinia stimpsoni from W. and S. Africa), Proharpinia, Heterophoxus, Pseudharpinia, Harpiniopsis and Harpinia. Where not otherwise mentioned, the type localities of all new species are in Australia).

BARTON, D.R. & H.B.N. HYNES, 1978. Seasonal study of the fauna of bed-rock substrates in the wave zones of lakes Huron and Erie. _____ Can. J. Zool. 56, 48-54. (Hyalella azteca (Huron) and Gammarus fasciatus (Erie) are among the dominant species).

BELLAN-SANTINI, D. & D.J. REISH, 1977. Utilisation de crustacés peracarides marins (isopodes et amphipodes) dans les études de toxicologie. Rev. int. Oceanogr. Med. 48, 103-105 (Not seen).

- V BENEDICT, B.R., 1977. Mayerella acanthopoda, a new species (Amphipoda, Caprellidae) from Southern California. ____ Crustaceana 33, 47-55.
- BENOIT, P.L.G., 1977. Amphipoda. ____ P. 466 in: La faune terrestre de l'Ile de Sainte-Hélène. Mus. R.Afr. centr. Tervuren, Annls Sci. zool. 220. (Orchestia platensis only)
- BORODITCH, N.D., 1978. (The Caspian Peracarida (Crustacea) in the Saratov Water Reservoir). ____ Zool. Zh. 57, 783-785 (In Russian. Eight amphipod spp. excluding Corophium)
- BOYLE, P.J. & R. MITCHELL, 1978. Absence of microorganisms in crustacean digestive tracts. ____ Science (Wash.) 200, 1157-1159 (i.a. Chelura terebrans)
- CADDY, J.F., T. AMARATUNGA, M.J. DADSWELL, T. EDELSTEIN, L.E. LINKLETTER, B.R. McMULLIN, A.B. STASKO & H.W. v.d. POLL, 1977. 1975 Northumberland Strait Project 1. Benthic fauna, flora, demersal fish and sedimentary data. ____ Manuscr. Ser. Fish. mar. Serv. (1431), 51 pp.
- λ CAINE, E.A., 1977. Feeding mechanisms and possible resource partitioning of the Caprellidae (Crustacea: Amphipoda) from the Puget Sound, USA. ____ Mar. Biol. 42, 331-336.
- DESPORTES, I. & T. GINSBURGER-VOGEL, 1977. Affinités du genre Marteilia, parasites d'huitres (maladie des Abers) et du Crustacé Orchestia gammarellus (Pallas) avec des Myxosporidies, Actinomyxidies et Paramyxidies. ____ C.R. Acad. Sci. Paris 285 D, 1111-1114.
- λ GELDIAY, R., A. KOCATAŞ & T. KATAÇAN, 1977. (The species of Peracarida and Eucarida (Crustacea, Malacostraca) from Bafa Lake, Turkey). ____ E.Ü. Fen Fakult. Dergisi B 1, 311-318 (In Turkish)
- λ GRAF, F., 1978. Les jonctions continues zonaires et maculaires d'un épithélium de Crustacé. ____ Biol. cell. 33, 55-62 (Orchestia cavimana)
- λ GRAF, F., 1978. Les sources de calcium pour les Crustacés venant de mer. ____ Arch. Zool. exp. gén. 119, 143-161.
- λ GRAF, F., 1978. Diversité structurale des jonctions intercellulaires communicantes (gap junctions) de l'épithélium des caecums postérieurs du crustacé Orchestia. ____ C.R. Acad. Sci. Paris 287 D, 41-44.
- λ GRAF, F., 1978. Extrusion massive de matériel nucléaire (par bourgeonnement ou directe) lors de l'inversion du sens de sécrétion d'un épithélium de Crustacé. ____ C.R. Acad. Sci. Paris 287 D, 1219-1222 (Orchestia cavimana)

- < GRAF, F. & Ph. MICHAULT, 1977. Les sphérules calciques de l'épithélium caecal d'Orchestia (Crustacé, Amphipode), forme de transport de calcium dans le sens apico-basal. ____ C.R. Acad. Sci Paris 284 D, 49-52.
- × GRAF, F. & E. SELLEM, 1977. Introduction artificielle du Crustacé Amphipode Orchestia cavimana Heller dans les environs de Dijon. ____ Bull. scient. Bourgogne 30, 107-113.
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- × HERHAUS, K.F., 1978. Der erste Nachweis von Corophium curvispium (sic) Sars, 1895 (Crustacea, Amphipoda, Corophiidae) im Dortmund-Ems-Kanal. ____ Nat. u. Heimat 38, 99-102.
- × HESSLER, R.R., C.L. INGRAM, A.A. YAYANAS & B.R. BURNETT, 1978. Scavenging amphipods from the floor of the Philippine trench. ____ Deep-Sea Res. 25, 1029-1047. (With evocative pictures of masses of Hirondellea gigas on bait).
- × HIRAYAMA, A., 1978. A new gammaridean Amphipoda, Cottesloe cyclodactyla sp. nov., from Amakusa, South Japan. ____ Publs Amakusa mar. biol. Lab. 4, 235-243.
- < HIRAYAMA, A., 1978. A new species of the amphipod genus Cyproides (sic) from Amakusa, Kyushu ____ Publs Amakusa mar. biol. Lab. 4, 245-251. (Cyproidea liodactyla n. sp.)
- × HUGHES, R.G., 1978. Life-histories and abundance of epizoites of the hydroid Nemertesia antennina (L.). ____ J. mar. biol. Ass. U.K. 58, 313-332. (In this and the next paper the amphipods dealt with are Erichthonius brasiliensis, Corophium sextoni and Pseudoprotella phasma)
- < HUGHES, R.G., 1978. Production and survivorship of epizoites of the hydroid Nemertesia antennina (L.) ____ J. mar. biol. Ass. U.K. 58, 333-346.

- IMABAYASHI, H., T. HANOOKA & M. YONO, 1977. (Feeding activities of juvenile and young red sea bream, *Chrysophrys major* Temminck et Schlegel, in the biotic community. 3. Intra-specific relationship in the population). ____ Bull. Nansei reg. Fish. Res. Lab. (10), 87-100 (In Japanese, not seen. English summary in ASFA 1 8, (19), 1978, p. 58. Gammaridea are main prey).
- KAMENSKAYA, D.E., 1977. Amphipods in the fouling of hydrotechnical installations in the Sea of Japan. ____ Sovjet J. mar. Biol. 3, 375-379 (22 spp, most important are Ischyroceridae and Corophiidae).
- X KARAMAN, G.S., 1977. Contribution to the knowledge of the Amphipoda. 77. Gammarus ochridensis Schäf. species complex of Ohrid Lake ____ Montenigrin. Acad. Sci. Arts, Glasnik (Sect. nat. Sci) 2, 49-89 (Six species have been confused sub nom. G. ochridensis: G. ochridensis s.s., G. parechiniformis n.sp., G. solidus n.sp., G. lychnidensis (= G. ochridensis f. lychnidensis Schellenberg), G. macedonicus and G. stankokaramani. A key to the species and short notes to their biology are provided).
- V X KARAMAN, G.S., 1977. Contribution to the knowledge of the Amphipoda (sic) 83. Cheirocratus armatus n.sp. from Suez region with some remarks to other members of this genus (fam. Gammaridae). ____ Poljoprivreda i Šumarstvo 23(2), 43-52. (C. robustus is considered as probably a junior synonym of C. sundevalli)
- V X KARAMAN, G.S., 1977. Contribution to the knowledge of the Amphipoda 84. One interesting member of the genus Echinogammarus Stebb. from Malta Island, E. ebusitanus (Marg. 1951)(fam. Gammaridae). ____ Poljoprivreda i Šumarstvo 23(3), 29-38.
- X KARAMAN, G.S., 1977. The value of genus Neogammarus (Ruffo 1937) and its relation to the genus Echinogammarus Stebb. 1889 (fam. Gammaridae)(Contribution to the knowledge of the Amphipoda 88). ____ Animalia 4, 109-121 (Neogammarus is a junior synonym of Echinogammarus, as are according to another paper "in press" Chaetogammarus, Marinogammarus and Pectenogammarus).
- X KARAMAN, G.S., 1977. Contribution to the knowledge of the Amphipoda. 90. Revision of Gammarus balcanicus Schaf. 1922 in Yugoslavia (fam. Gammaridae). ____ Poljoprivreda i Šumarstvo 23 (4), 37-60. (The following taxa are sunk as synonyms of G. balcanicus: G. spinicaudatus, G. konjicensis, G.k. plancici, G.k. istrianus, G. pavlovici, G.p. montanus, Rivulogammarus neretvanus, G.klisanus, G. balcanicus pannonicus, G. b. occidentalis, G. b. bilecanus and G. b. stankoi. A list of the 16 Gammarus spp. in Yugoslavia is provided).

- ✓ KARAMAN, G.S., 1977. Contribution to the knowledge of the Amphipoda. 78. Niphargus elegans Garbini, 1894, in Italy. ____ Crustaceana Suppl. 4, 177-187.
- × KOCATAŞ, A., 1978. (Contribution à l'étude des peuplements des horizons supérieurs de substrats rocheux du Golfe d'Izmir). ____ Ege Univ. Fen Fakult. Monogr. Ser. 12, 1-93 (In Turkish, with extensive French résumé on pp 1-4)
- ✓ × KRAPP-SCHICKEL, G., 1978. Die Gattung Amphithoe (Crustacea, Amphipoda) im Mittelmeer. ____ Bijdr. Dierk. 48, 1-15. (Five species, of which A. spuria (=A. cf. falsa s. K-S 1969) is new. The author synonymizes A. neglectus Lincoln with A. helleri Karaman (=A. bicuspis Heller)
- ✓ × LEDOYER, M., 1978. Contribution à l'étude des amphipodes gammariens profonds de Madagascar (Crustacea). ____ Tethys 8 (1976), 365-382 (New taxa: Byblisoides plumicornis, Unciolella articulata, Eusirus crosnieri, Leucothoe laticoxa, Cyphocaris cornuta, Trischizostoma denticulatum, Amathillopsis septemdentata. Also described are Ampelisca miops, Cyphocaris faurei, Onesimoides cavimanus and O. chelatus).
- LEPPAKOSKI, E.J. & L.S. LINDSTRÖM, 1978. Recovery of benthic macrofauna from chronic pollution in the sea area off a refinery plant, southwest Finland. ____ J. Fish. Res. Bd Can. 35, 766-775.
- × MAREN, M. J. van, 1978. Distribution and ecology of Gammarus tigrinus Sexton, 1939, and some other amphipod Crustacea near Beaufort (North Carolina, USA). ____ Bijdr. Dierk. 48, 45-56.
- × MAUCLINE, J., 1977. The integumental sensilla and glands of pelagic Crustacea. ____ J. mar. biol. Ass. U.K. 57, 973-994.
- × MAUCLINE, J., 1977. Growth and moulting of Crustacea, especially euphausiids. ____ Pp 402-422 in N.R. Andersen & B.J. Zahuranec (eds) Oceanic Sound Scattering Prediction.
- ✓ MCKINNEY, L.D., R.D. KALKE & J.S. HOLLAND, 1978. New species of amphipods from the western Gulf of Mexico. ____ Contr. mar. Sci. 21, 133-159 (New taxa: Netamelita barnardi, Eriopisa incisa, Parametopella texensis, Photis macromanus).
- PEARCY, W.G. & D. HANCOCK, 1978. Feeding habitats of Dover sole, Microstomus pacificus, rex sole, Glyptocephalus zachirus, slender sole, Lyopsetta exilis, and Pacific sanddab, Citharichthys sordidus, in a region of diverse sediments and bathymetry off Oregon. ____ Fish. Bull. 76, 641-651. (Dover and rex soles feed mostly on benthic invertebrates, mainly polychaetes and amphipods, the other two mainly on pelagic crustaceans).

- X PIEPER, H.-G., 1978. Ökophysiologische und produktionsbiologische Untersuchungen an Jugendstadien von Gammarus fossarum Koch 1835. ____ Arch. Hydrobiol. Suppl. 54, 257-329. ("The animals develop mainly in the uppermost portions of hyporheic interstitial waters. The amount of nutrients contained in the sediment of both streams is correlated with the particle size of the sediments and together with current conditions of the epigaeic stream water and the oxygen content within the sediment, determines habitat selection and abundance of juveniles". Juvenile specimens prefer the interstitial habitat and are in this way protected from losses through drift: drift is also compensated for by upstream migration, mainly of adults.)
- X PUTTICK, G.M., 1978. The diet of the Curlew Sandpiper at Langebaan Lagoon, South Africa. ____ The Ostrich 49, 158,167 (Urothoe grimaldii is a common prey species).
- X RICHTER, G., 1978. Einige Beobachtungen zur Lebensweise des Flohkrebsses, Siphonoecetes della-vallei. ____ Nat. u. Mus. 108, 259-266.
- X ROBERTSON, P.B. & C.R. SHELTON, 1978. Two new species of haustoriid amphipods (Crustacea Amphipoda) from the northwestern Gulf of Mexico. ____ Contr. mar. Sci. 21, 47-62. (Protohaustorius bousfieldi n. sp. and Parahaustorius obliquus n. sp.)
- SAMARAS, W.F. & F.E. DURHAM, 1978. Interrelationships between whale-lice (Amphipoda), barnacles (Cirripedia) and the California gray whale (Eschrichtius robustus). ____ Proc. 2. Conf. Biol. mar. Mamm., San Diego, Calif. p. 23 (Not seen).
- SCAPINI, F., 1978. Effect of immersion: orientation of the littoral amphipod Talitrus saltator Montagu. ____ Monit. zool. ital. 12, p. 71.
- X SEGERSTRÅLE, S.G., 1978. The negative correlation between the abundance of the amphipod Pontoporeia and the bivalve Macoma in Baltic waters and the factors involved. ____ Ann. zool. fenn. 15, 143-145.
- X SEGERSTRÅLE, S.G., 1978. Upper limits of the depth range and temperature tolerance of the Baltic Pontoporeia affinis (Crustacea, Amphipoda). ____ Ann. zool. fenn. 15, 200-201.
- X STOCK, J.H., 1978. A remarkably variable phreatic amphipod from Mallorca, Rhipidogammarus variicauda n.sp., in which the third uropod can assume the "parviramus" and the "variiramus" condition. ____ Bijdr. Dierk. 48, 89-95.

- VADER, W. & P.J. JOHANNESSEN, 1978. Notes on Norwegian marine Amphipoda. 6. Menigratopsis svennilssoni (Lysianassidae), an amphipod new to the Norwegian fauna. ____ Sarsia 63, 335-336.
- VAN DOLAH, R.F., 1978. Factors regulating the distribution and population dynamics of the amphipod Gammarus palustris in an intertidal salt marsh community. ____ Ecol. Monogr. 48, 191-217.
- YAYANOS, A.A., 1978. Recovery and maintenance of live amphipods at a pressure of 580 bars from an ocean depth of 5700 meters. ____ Science (Wash.) 200, 1056-1059 (Not seen).
- YOUNG, D.K. & M.W. YOUNG, 1978. Regulation of species densities of sea-grass-associated macrobenthos: Evidence from field experiments in the Indian River estuary, Florida. ____ J. mar. Res. 36, 569-593.

- ANDERSIN, A.-B., J. LASSIG, L. PARKHONEN & H. SANDLER, 1978. Long-term fluctuations of the soft-bottom macrofauna in the deep areas of the Gulf of Bothnia 1954-1974; with special reference to Pontoporeia affinis Lindström (Amphipoda). ____ Finn. mar. Res. 244, 137-144.
- BACESCU, M. & Z. MURADIAN, 1977. Contribution à la connaissance des pécararidés des eaux du nord-est de Libye. ____ Rapp. P.V. Réunion. Comm. int. Explor. Sci. Mer med. 24, 111-120 (Not seen).
- BRODIE, D.A. & K. HALCROW, 1977. The ultrastructure of the sinus gland of Gammarus oceanicus (Crustacea: Amphipoda). ____ Cell Tiss. Res. 184, 557-564.
- BRODIE, D.A. & K. HALCROW. 1978. Hemolymph regulation to hyposaline and hypersaline conditions in Gammarus oceanicus (Crustacea: Amphipoda). ____ Experientia 34, 1297-1298.
- BRUCHHAUSEN P.M., J.A. RAYMOND, S.S. JACOBS, A.L. DeVRIES, E.M. THORNDIKE & H.H. DeWITT, 1979. Fish, crustaceans and the sea floor under the Ross Ice Shelf. ____ Science, N.Y. 203, 449-451.
- BRUNEL, P., M. BESNER, D. MESSIER, L. POIRIER, D. GRANGER & M. WEINSTEIN, 1978. Le traîneau suprabenthique MACER-GIROQ: appareil amélioré pour l'échantillonnage quantitatif étagé de la petite faune nageuse au voisinage du fond. ____ Int. Rev. ges. Hydrobiol. 63, 815-829.
- BRUSCA, G.J., 1979. Contributions to the knowledge of hyperiid amphipods of the family Scinidae from near Hawaii, with a description of a new species, Scina hawaiiensis. ____ Pacif. Sci. 32 (1978), 281-292 (With key to the 9 Hawaiian spp., and illustration of the less well-known ones).
- BUSDOSH, M. & R.M. ATLAS, 1977. Toxicity of oil slicks to arctic amphipods. ____ Arctic 30, 85-92. ('Exposure to oil resulted in death, especially if animals physically entered the slicks'. Experiments on Boeckosimus affinis and Gammarus "zaddachi" (This latter is in reality G. setosus: Dr. Busdosh kindly sent me specimens))
- CUADRAS, J. & F. PEREIRA, 1977. Invertebrates associated with Dardanus arrosor (Anomura, Diogeneidae). ____ Vie Milieu 27 A, 301-310. (Along the Spanish mediterranean coast 10% of the hermit-crabs contain Liljeborgia dellavallei inside the houses. Also Lysianassa plumosa was collected).

- & CUPPEN, H.P.J.J., 1977. (A contribution to the knowledge of the distribution of Niphargus species (Crustacea, Amphipoda) in S. Limburg, Holland). _____ Natuurh. Maandbl. ? , 111-117. (Dutch with English summary. N. schellenbergi, N. aquilex and N. virei)
- DAVIS, J.C., 1978. Disruption of precopulatory behavior in the amphipod Anisogammarus pugettensis upon exposure to bleached kraft pulpmill effluent. _____ Water Res. 12, 273-275 (Not seen).
- DAWNER, D.F. & D.H. STEELE, 1979. Some aspects of the biology of Amphiporeia lawrenciana Shoemaker (Crustacea, Amphipoda) in Newfoundland waters. _____ Can. J. Zool. 57, 257-263.
- DE MARCH, B.G.E., 1978. The effect of constant and variable temperatures on the size, growth and reproduction of the freshwater amphipod Hyalella azteca (Saussure). _____ Can. J. Zool. 56, 1801-1806.
- ✕ DEXTER, D.M., 1978. The infauna of a subtidal sand-bottom community at Imperial Beach, California. _____ Calif. Fish Game 64, 268-279.
- ELOFSSON, R., H. MYHRBERG, R. ARAMANT, O. LINDVALL & B. FALCK, 1978. Catecholaminergic salivary glands in Gammarus pulex (Crustacea: Amphipoda): an electron microscopic and microspectrofluorometric study. _____ J. Ultrastr. Res. 64, 14-22 (Not seen)
- GIGINYAK, Yu. G., ? (The fecundity of some crustaceans from the sublittoral zone of the Davis Sea, the Antarctic). _____ Okeanologiya ? (In Russian, not seen. 5 amph. and 2 isopods. Can somebody furnish me the complete reference?)
- HAJDUK, Z. & A. OGORZALEK, 1978. (Niphargellus arndti Schellenberg, 1933, from Kontaktowa cave near Klesno). _____ Acta Univ. wratislaviensis 311 (Studia geograficzne 24), 155-157 (In Polish, English summary. The sixth known locality of N. arndti; it is regularly to be found in a small lake in the deepest part of a cave in the Sudeten mountains).
- HARBISON, G.R., L. P. MADIN & N.R. SWANBERG, 1978. On the natural history and distribution of oceanic ctenophores. _____ Deep Sea Res. 25, 233-256 (Amphipod associates on pp 239-240 and in Table 5 on p. 251).
- ✓ ISERN ARUS, J., 1978. (On the variability of Caprella acanthifera) _____ Bol. Socied. Hist. nat. Baleares 22 (1977), 48-53 (In Spanish. Describes a.o. a new "forma", C. a. pityusensis)
- JARAMILLO, E., 1978 (Zonation and structure of the macrofaunistic community in sandy beaches of southern Chile (Mehuín, Valdivia). _____ Stud. neotrop. Fauna Environm. 13, 71-92 (In Spanish)

- JULIN, A.M. & H.O. SANDERS, 1978. Toxicity of the IGR, diflubenzuron, to freshwater invertebrates and fishes. _____ Mosquito News 38, 256-259. (Not seen, a.o. tests on Gammarus pseudolimnaeus)
- LENEL, R., G. NEGRE-SADARGUES & R. CASTILLO, 1978. Les pigments carotenoides chez les Crustacés _____ Arch. Zool. exp. gén. 119, 297-334 (Not seen).
- LEVINGS, C.D. & D. LEVY, 1977. A "bug's-eye" view of fish predation. Pp 147-152 in C.A. Simenstad & S.J. Lipovsky (eds.) Proc. 1. Pacif. NW techn. Worksh. Fish Food Habit Stud., Astoria 1976, Wash. Sea Grant Rep. 77-2.
- X LINCOLN, R.J., 1979. A new species of Lysianassa Milne-Edwards (Amphipoda: Lysianassidae) from the Channel Islands. _____ J. nat. Hist. 13, 251-255 (L. insperata n.sp.)
- LIPPS, J.H., T.E. RONAN & T.E. DELOCA, 1979. Life below the Ross Ice Shelf, Antarctica. _____ Science, N.Y. 203, 447-449.
- X MCKINNEY, L.D., 1978. Amphilochoidea (Crustacea: Amphipoda) from the western Gulf of Mexico and Caribbean Sea. _____ Gulf Res. Rep. 6, 137-143 (New taxa: Amphilocheus casahoya n.sp., A. delacaya n.sp. and Gitanopsis laguna n.sp.)
- X MACPHERSON, E., 1978. (Food and feeding of Micromesistius poutassou (Risso, 1810) and Gadiculus argenteus argenteus Guichenot, 1950 (Pisces, Gadidae) in Mediterranean Sea) _____ Invest. Pesq. 42, 306-315 (In Spanish. This and the two following papers contain lists of prey animals a.o. amphipods).
- X MACPHERSON, E., 1978. (Food and feeding of Symphurus nigrescens (Pisces, Cynoglossidae) in Mediterranean Sea.) _____ Invest. Pesq. 42, 325-333 (In Spanish)
- X MACPHERSON, E., 1978 (Food and feeding of Phycis blennoides (Brünich) and Antonogadus megalokynodon (Kolombatovic) (Pisces: Gadidae) in Mediterranean Sea). _____ Invest. Pesq. 42, 455-466 (In Spanish. These fishes eat many amphipods).
- X MAREN, M.J. van, 1979. The amphipod Gammarus fossarum Koch (Crustacea) as intermediate host for some helminth parasites, with notes on their occurrences in the final host. _____ Bijdr. Dierk. 48, 97-110 (A study by monthly samplings near Lyon, France. The most important parasites were the Acanthocephala Pomphorhynchus laevis and Polymorphus minutus)
- X MAURER, D., L. WATLING, W. LEATHEM & P. KINNER, 1979. Seasonal changes in feeding types of estuarine benthic invertebrates from Delaware Bay. _____ J. exp.mar. Biol. Ecol. 36, 125-155 (Amph. p. 152-154).

- x MILLS, E.L., 1976. Stebbing, Thomas Roscoe Rede. ____ Dict. scient. Biogr. 12, 8-9.
- MUIRHEAD- THOMSON, R.C., 1978. Lethal and behavioural impact of permethrin (NRDC 143) on selected stream macroinvertebrates. ____ Mosquito News 38, 185-190 (Not seen, includes work on Gammarus)
- x MUNKEMULLER, K. & K.F. HERHAUS, 1978. Beobachtungen an drei Brackwasserkrebsen im Mittellandkanal: Neomysis integer (Leach, 1814), Gammarus tigrinus Sexton, 1939, und Corophium lacustre Vanhöffen, 1911 (Crustacea, Peracarida). ____ Nat. u. Heimat 38, 109-113.
- x MYERS, A.A. & D. McGRATH, 1978. Littoral and benthic investigations on the west coast of Ireland 8. A new species of amphipod, Lembos denticarpus sp. nov. (Aoridae), from Galway Bay. ____ Proc. R.Ir. Acad 78 B, 125-131.
- x MYERS, A.A. & D. McGRATH, 1979. The British and Irish species of Siphonoecetes Kröyer (Amphipoda, Gammaridea). ____ J. nat. Hist. 13, 211-220. (Key to the 7 European spp. S. kroyeranus Bate is shown to be a senior synonym of S. colletti Boeck. S. striatus n.sp. has been overlooked previously).
- x NAIR, K.K.C., 1977. Distribution and relative abundance of Paraphronimidae (Hyperiidea, Amphipoda) in the Indian Ocean. ____ Proc. Symp. warm Water Zooplankt., Goa, 155-167. (Not seen).
- x ORTIZ TOUZET, M., 1978. (A new quantitative sampling device for the collection of vagile meso-and microorganisms from hard substrates). ____ Invest mar. ciencias (8) 33, 25-33 (In Spanish)
- x ORTIZ, M., 1978. (Marine benthonic invertebrates of Cuba. 1. Crustacea, Amphipoda, Gammaridea). ____ Invest. mar. ciencias (8) 38, 1-10 (In Spanish. 77 species).
- PECK, S.B. & J.J. LEWIS, 1978. Zoogeography and evolution of the subterranean invertebrate faunas of Illinois and southeastern Missouri. ____ NNS Bull. 40, 39-63 (Not seen).
- POCHON- MASSON, J., 1978. Les différenciations infrastructurales liées à la perte de la motilité chez les gamètes mâles des Crustacés. ____ Arch. Zool. exp. gén. 119, 465-470 (Not seen).
- x PUTTICK, G.M., 1977. Spatial and temporal variations in intertidal animal distribution at Langebaan lagoon, South Africa. ____ Trans. roy. Soc. S.Afr. 42, 403-440 (Many data on Urothoe grimaldii).
- x PUTTICK, G.M., 1978. The diet of the Curlew Sandpiper at Langebaan Lagoon, South Africa. ____ The Ostrich 49, 158-167 (a.o. Urothoe grimaldii)

- RATEAU, J.G. & C. ZERBIB, 1978. Etude ultrastructurale des follicules ovocytaires chez le crustacé amphipode Orchestia gammarellus (Pallas). ____ C.R. Acad. Sci. Paris 286 D. 65-68.
- REISE, K., 1978. Experiments on epibenthic predation in the Wadden Sea. ____ Helgol. wiss. Meeresunters. 31, 55-101.
- RICHTER, G., 1978. Beobachtungen zu Entwicklung und Verhalten von Phronima sedentaria (Forskål)(Amphipoda). ____ Senckenbergiana marit. 10, 229-242.
- SALOMON, C.H. & S.P. NOUGHTON, 1978. Benthic macroinvertebrates inhabiting the swash zone of Panama City Beach, Florida. ____ Northeast Gulf Sci. 2, 65-72 (Not seen. Haustorius sp. codominant)
- SEUGE, J., R. BLUZET & F.J. RODRIGUE-RUTZ, 1978. Effects d'un mélange herbicide (2.4 D et 2.4.5-T): toxicité aigue sur 4 espèces d'invertébrés limniques; toxicité chronique chez le mollusque pulmoné Lymnaea. ____ Environm. Poll. 16, 87-104 (Not seen. Gammarus pulex is one of the 4 spp.)
- SHULENBERGER, E., 1979. Distributional patterns and niche separation among North Pacific hyperiid amphipods. ____ Deep-Sea Res. A 26, 293-316.
- SMITH, K.L., G.A. WHITE, M.B. LAVER, R.R. McCONNAUGHEY & J.P. MEADOR, 1979. Free vehicle capture of abyssopelagic animals. ____ Deep-Sea Res. 26 A, 57-64. (a.o. Eurythenes gryllus, up to 123 mm long).
- γ SORBE, J-C., 1978. Inventaire faunistique des Amphipodes de l'estuaire de la Gironde. ____ Bull. Cent. Etud. Rech. sci. Biarritz 12, 369-381.
- * SORBE, J-C., 1979. Systématique et écologie des amphipodes gammaridés de l'estuaire de la Gironde. ____ Cah. Biol. mar. 20, 43-58. (Gammarus crinicornis, G. salinus and G. zaddachi are the important free-swimming species)
- SUTCLIFFE, D.W., 1978. Water chemistry and osmoregulation in some arthropods, especially Malacostraca. ____ Ann. Rep. Freshw. biol. Ass. 46, 57-69 (Not seen).
- γ TARARAM, A.S., Y. WAKABARA & F.P.P. LEITE, 1978. Notes on Parhyale hawaiiensis (Dana). Crustacea - Amphipoda. ____ Bull. mar. Sci. 28, 782-786.
- λ THURSTON, M.H., 1979. Scavenging abyssal amphipods from the North-East Atlantic Ocean. ____ Mar. Biol. 51, 55-68 (Seven lysianassids from 4855 m, in baited traps, with Paralicella caperesca most common. Many biological data).

- VADER, W., 1978. Allogausia recondita Stasek (Amphipoda, Lysianassidae), an associate of the aggregating sea anemone, Anthopleura elegantissima (Brandt) in California. Preliminary report). _____ Tromsø, off-set, 8 pp.
- VADER, W., 1979. Associations between amphipods and echinoderms. _____ Astarte 11 (1978), 123-135. (28 amphipod species in 15 families have been found on or in echinoderms. All echinoderm classes are involved).
- VERHOEVEN, J.T.A., 1978. Natural regulation of plant biomass in a Ruppia- dominated system. _____ Proc. EWRS Symp. on aquatic Weeds 5, 53-61 (Gammarus zaddachi feeds on Ruppia, consuming c 0.4 mg/mg animal/day).
- WESTERNHAGEN, H. von, H. ROSENTHAL, S. KERR & G. FUERSTENBERG, 1979. Factors influencing predation of Hyperoche medusarum (Hyperiid: Amphipoda) on larvae of the Pacific Herring Clupea harengus pallasii. _____ Mar. Biol. 51, 195-201.
- WILLIAMS, J.A. & E. NAYLOR, 1978. A procedure for the assessment of significance of rhythmicity in time-series data. _____ J. Chronobiol. 5, 435-444 (Not seen. Involves Talitrus saltator).

- ABOLMASOVA, G.I., 1978. (Energetic and plastic metabolism interrelation in Gammarus olivii M.-Edw. at different temperatures.) _____
2. All-Union Conf. Shelf Biol., Sevastopol 1, 12-13. (In Russian. Rates of respiration at different temperatures: at 5°C- 0.306, 10°C-0.347, and 20°C- 1.245 mm³ O₂h⁻¹ (at a weight of 1 mg). Mean specific growth rate increases from 0.006 at 5°C to 0.126 at 20°C. At low temp 77% of energy is used for growth)
- AMIN, O.M., 1978. On the crustacean hosts of larval acanthocephalan and cestode parasites in southwestern Lake Michigan. _____ J. Parasitol. 64, 842-842 (Data on 3 Acanthocephala spp from Pontoporeia affinis)
- ANDERSON, J.W., S.L. KIESSER & J.W. BLAYLOCK, 1979. Comparative uptake of naphthalenes from water and oiled sediment by benthic amphipods. _____ Proc. 1979 Oil Spill Conf. L.A., 579-? (Not seen).
- x BARNARD, J.L., 1979. Littoral Gammaridean Amphipoda from the Gulf of California and the Galapagos Islands. _____ Smithson. Contr. Zool. 271, 1-149 (New taxa: Gitanopsis baciroa, Ampithoe guaspere, A. plumulosa tepahue, A. tahue, A. vacoregue, Lembos achire, L. tehuecos, Posophotis n.gen. (Corophiidea) with type species P. seri, Varohios n.gen. (Corophiidea) with type species V. toplanus, Zoedeutopus n. gen. (Corophiidea) with type species Z. cinaloanus, Pontogeneia apata, Anchialella n.gen. (Gammaridae) with type species A. vulcanella, Dulzura gal, Elasmopus bampo, E. hawaiiensis n. status (was spp of E. ecuadorensis), E. mayo, E. ocoroni, E. serricatus n. status (was ssp of E. rapax), E. temori, E. tiburoni, E. tubar, E. zoanthidea, Maera reishi, M. chinarra, Allorchestes carinatus n. status (was ssp. of A. malleolus), Hyale darwini, H. canalina, H. yaqui, H. zuaque, H. guasave, H. californica n. status (was ssp of H. grandicornis), H. humboldti, Najna kitamati, Parhyale penicillata n. status (was ssp of P. fascigera), Microjassa chinipa and Heterophilias galapagoanus.

A number of other species is discussed and illustrated, especially in the genera Ampithoe, Pontogeneia, Elasmopus, Allorchestes, Hyale and Parhyale. Most northern-hemisphere species of the Pontogeneia-group are transferred back to Pontogeneia, but P. nasa and probably P. quinsana belong in Tethygeneia. Allorchestes malleolus and A. vladimiri are synonymized with A. angusta. The Hyale frequens- group and the H. grandicornis- group are again reviewed, many earlier identifications corrected and a number

of "formas" elevated to specific rank. Keys are provided to the species of Elasmopus and Hyale in the region and to all Allorchestes)

- BELLAN-SANTINI, D., G. BELLAN & D.J. REISCH, 1979. Molysmologie marine - variations de l'influence d'altérageñes suivant le cycle d'activit  jour/nuit de certains organismes marins. ____ C.R. Acad. Sci. Paris D 288, 139-141. (Not seen, a.o. on Podocerus fulanus)
- BIERNBAUM, C.H., 1979. Influence of sedimentary factors on the distribution of benthic amphipods of Fishers Island Sound, Connecticut. ____ J. exp. mar. Biol. Ecol. 38, 201-233 (Not seen).
- BOYLE, P.J., 1978. Absence of microorganisms in crustacean digestive tracts. ____ Science, N.Y. 200, 1157-1159.
- X CAINE, E., 1979. Functions of swimming setae within caprellid amphipods (Crustacea) ____ Biol. Bull. 156, 169-178.
- CHAMBERS, M.R. & H. MILNE, 1979. Seasonal variation in the condition of some intertidal invertebrates of the Ythan estuary, Scotland ____ Est. coast, mar. Sci. 8, 411-419 (a.o. Corophium volutator)
- X CHASS , C. & D. MORVAN, 1978. Six mois apr s la mar e noire de l'Amoco Cadiz, provisoire de l'impact biologique. ____ Penn ar Bed 11, 311-33
- CZECZUGA, B. & A. SKALSKI, 1978. Carotenoids in Niphargus casimiriensis Skalski (Amphipoda) from Artesian wells. ____ Int. J. Speleol. 9, 131-136.
- X DICKSON, G.W., 1977. Variation among populations of the troglobytic amphipod crustacean Crangonyx antennatus living in different habitats. 1. Morphology. ____ Int. J. Speleol. 9, 43-58.
- X DICKSON, G.W., 1979. The importance of cave mud sediments in food preference, growth and mortality of the troglobitic amphipod crustacean Crangonyx antennatus Packard (Crangonyctidae). ____ Crustaceana 36, 129-140.
- FERRARESE, U. & B. SAMBUGAR, 1977. (Investigation of the interstitial hyporheal fauna in the Adige River in relation to the degree of pollution). ____ Rev. Idrobiol. 15 (1976), 47-128 (In Italian, not seen).
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- KHMELEVA, N.N. & A.P. GOLUBOV, 1978. (Generative and exuvial growth rate as a function of weight in Crustaceans). ____ Dokl. Ak. Nauk SSSR 240, 1497-1499 (In Russian, not seen)

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LAST SECOND ADDITIONS

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