Newsletter of the International Association of Meiothologists

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INTERNATIONAL ASSOCIATION OF MEIOBENTHOLOGISTS – FOUNDED 1966

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Dues are £5 per year payable to Mike Gee.

“This newsletter is not deemed to be a valid publication for formal taxonomic purposes”
EDITORIAL

TEMPORAL EVOLUTION OF A MEIOBENTHIC COMMUNITY

Introduction

Long term data on changes in community structure are rare for most groups of organisms, but can provide useful insights into the mechanisms which determine this structure, tests of ecological theory and (if clear trends can be identified) predictions of future events. Here I report a 25-year study of a widespread meiobenthic community. The analysis has been facilitated by the fact that, although sparsely distributed for most of the time, this community forms dense aggregations at more or less regular intervals, at which times a census is relatively easy to make.

Specially-timed communal displays (in this case termed "Conferences") occur in many groups of organisms but as yet only one unifying theory to explain them has been postulated. Wynne-Edwards (1962) termed this class of social behaviour "epideictic" display, which, he postulated, evolved to provide the feedback necessary for widely dispersed populations to maintain a density and structure appropriate to available resources. In other words, normally solitary organisms have a brief gregarious phase during which intense interactions result in the formulation of a future strategy for the mutual benefit of the whole population or community. This study was undertaken with a view to examining the degree to which this meiobenthic community conforms to, or refutes, this theory.

Methods

Data on community structure are available for seven communal gatherings, and have been obtained from bibliographic information compiled at the time plus a photographic census of each gathering. The latter are presented in Plates 1-7. The first aggregation occurring three years after the initial establishment of this community, and subsequent aggregations were at the following places and times:

1. Tunis, Tunisia. 1–11 July 1969
3. Hamburg, Germany. 22–27 August 1977
5. Ghent, Belgium. 16–20 August 1983
7. Vienna, Austria. 21–25 August 1989

Univariate measures which have been calculated include overall population density, frequency of occurrence and sex ratio. A triangular similarity matrix comparing the specific composition of each gathering (standardised to remove the effect of sample size) was constructed using the Bray–Curtis similarity measure, and these data have been subjected to non-metric Multidimensional Scaling Ordination (MDS). This type of ordination makes no assumptions about multivariate normality of the data, and simply uses the rank orders of similarities in the triangular matrix.

Results

After an initial more or less linear increase, overall population density began to fluctuate rather widely and unpredictably after Conference 4 (Fig. 1). The absence of a clear linear trend makes it impossible to predict the expected density at the next Conference with any accuracy.

Fig. 1. Total numbers of individuals attending each Conference

More than 70% of the total of 355 individuals who have attended these Conferences have done so on only one occasion. The number of individuals attending higher numbers of Conferences decreases dramatically and exponentially (Fig. 2). No individual has attended all seven Conferences, and only three individuals have attended six Conferences (O. Giere, R. Higgins, W. Hummon). On average, 66.5% of those attending each Conference are doing so for the first time.
between points represents the degree of similarity between them in terms of the composition of individuals identified by name. The major (left–right) axis of the ordination clearly reflects rather regular changes in the composition of these Conferences over time. However, at the right hand side of the ordination there is a clear vertical separation of Conferences, with Ghent and Vienna at the top and South Carolina and Tampa below. This clearly results from major locational shifts of these gatherings between two continents, and reflects the problems of long-distance migration.

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Fig. 2. Number of conferences attended by each participant

The sex ratio (proportion of females to males) was initially biased strongly in favour of males, but has increased in a linear fashion (Fig. 3). The equation for the least squares regression is:

Sex ratio = -0.066 + 0.096 Conference No.

If this trend continues, approximate equality of the sexes should be achieved by Conference 10.

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Fig. 3. Sex ratio at each conference, with fitted linear regression line

The two dimensional MDS ordination is shown in Fig. 4. For those unfamiliar with such ordinations, they can be thought of as a map in which the physical distance

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Fig. 4. MDS ordination by conference, with similarity defined by common participants. Tu = Tunis, Yo = York, Ha = Hamburg. SC = South Carolina, Gh = Ghent, Ta = Tampa, Vi = Vienna

Conclusions

There are several implications of the above analyses for the future well-being of this community. The rapid turnover of individuals, relative to their generation time, could on the one hand be considered healthy but more probably is a consequence of many individuals being forced to leave this community because of some limiting resource. Circumstantial evidence suggests that this resource might be money, which in turn limits the numbers or research grants and tenured posts available. Clearly, lack of finances also precludes attendances at conferences, particularly those involving transatlantic crossings, and this is evidenced by the observed difference in the composition of European and N. American Conferences revealed by the MDS analysis.

The increase in the sex ratio can only be viewed with optimism from the point of view of both sexes. Adaptive changes in the sex ratio of other meiofaunal organisms have been noted, and a ratio in favour of males appears to be advantageous at low population densities and a ratio in favour of females at high densities (Battaglia, 1964; Pentzer, 1969). However, comparison of Figs. 1 and 3 suggests that the sex ratio in this case does not correspond closely
with population density. Indeed, since the generation time of these organisms is in the order of 20 y, direct feedback to the community over the period of observation could not have been observed. Further, no overt nuptial activity has been observed at these gatherings, and none of the offspring of participants has so far recruited to this community. Changes in the sex ratio do not therefore appear to be adaptive in the sense of regulating population numbers, and are more likely to have resulted from some unidentified changes in the social structure of this community. Regulation through the establishment of a social hierarchy is also unlikely, as no such hierarchy has been evidenced.

Population regulation cannot therefore be considered as the primary purpose of these gatherings. It is perhaps appropriate, therefore, to speculate on the benefits that they might accrue to the participants, since if there were no clear benefits such gatherings would not occur. Of all the mechanisms of interaction identified by Wynne–Edwards, the use of sound and of visible signals seems to predominate. Evidence points to the fact that these conferences are for the purpose of intellectual and social stimulation which in some way sustains this community and provides an impetus and future direction for its activities. The universality of Wynne–Edwards’ theory is therefore supported with the qualification that, for higher organisms at least, the advantages of gregarious behaviour may not simply be concerned with long-term survival but with rather more esoteric improvements in the well-being of the community and the quality and utility of its product.

To obtain these benefits – COME TO EIMCO!

References

Richard Warwick

25th ANNIVERSARY OF PSAMMONALIA

Don Zinn and I have the following item for the twenty-fifth anniversary issue of PSAMMONALIA:

On 10 November 1966, twenty-five years ago, we distributed the first copy of PSAMMONALIA.

A long line of credits, names of colleagues who invested in the future, which is now, should appear here instead of these few words of reflection. Sufficient to say that the International Association of Meiothologists has become a viable and productive professional organization which continues to be a catalyst in meiofaunal research. Those of us who were once the new generation, challenged by a remarkable assemblage of sediment-inhabiting invertebrates, still consider ourselves no more than slightly more experienced students of meiofaunology. Yet, we feel a great sense of collective accomplishment for we know we have come a long way.

We who have been privileged to contribute to this field since the first issue of PSAMMONALIA appeared are confident that our younger colleagues will continue to expand the study of meiofauna throughout the next century with equal vigour. We trust that twenty-five years hence an issue of PSAMMONALIA will assure its membership that such has been the case. Thus, with considerable pride in what we helped initiate, we invite all who read this, and especially those colleagues who have made PSAMMONALIA and the International Association of Meiothologists a continuing success, to join us in a libation to this anniversary, and to the memory of friends who are no longer among us.

Bob Higgins and Don Zinn

Meiobenthologists, so they say,
Are sedimentiological about their prey;
They dig and delve on sandy shore,
Or scrape the bottoms of ocean floor.
Their grainy (brainy?) business employs porosity
To search the contiguous (aqueous) lacunarosity!

Donald Zinn
At the informal meeting of psammonologists following the very successful symposium on the biology of marine interstitial fauna at the AIBS Meetings in College Park, Md., last August, it was suggested that an informal means of communication be established among kindred interests of the interstitial fauna. This issue of 'Psammonalia' is the first item of dialogue!

The object of this bulletin, which will be issued on an irregular schedule, hopefully at least twice a year, is to maintain communication among American psammonologists and to note research items and papers, of psammic interest, personal and personnel news and meetings and conferences harboring papers on the interstitial fauna and its milieu. Comments, suggestions and brief notes for inclusion will be welcomed by the editors, Dr. Robert P. Higgins, Dept. of Biology, Wake Forest College, Winston-Salem, N.C. 27106 and Dr. Donald J. Zinn, Dept. of Zoology, University of Rhode Island, Kingston, R. I. 02881.

It is particularly important for each scientist to communicate such information to the editors. We can be of much service if research papers, etc. are noted in subsequent issues of one bulletin and, indeed, the continuance will depend upon the response of those who receive it.

It is hoped that we will be able to schedule a meeting much like the post-symposium session August, at the AAAS meetings in Washington. The tentative time for this gathering is the afternoon of Wednesday, 28 December. The AAAS program will include a note on this meeting and provide time and place information. At that
time we will be able to discuss plans for future gatherings and perhaps additional symposia and enjoy an opportunity to exchange ideas on current investigations of the mysteries of the fauna, flora and waters of the intertidal and subtidal sediment lacanae.

The mailing list has been included with this bulletin. Please respond by card upon receipt of this bulletin, giving us zip code or corrected address information, area of interest (if not already noted), etc. New names will be added by request.

The papers presented at the symposium are collecting slowly at the University of Rhode Island for eventual formal publication as a unit in an acceptable journal.

Recent Publications:


CHANGE OF ADDRESS

Institute for Marine Scientific Research (IZWO)
Dr. ir. E. Jaspers – Director
Victoriaalaan 3
B-8400 Oostende
BELGIUM
Tel. +32-59-32 10 45
Fax. +32-59-32 11 35

Teresa Radziejewska
C/o Dept Zool. & Physiol.
Louisiana State University
Baton Rouge, LA 70803
USA

Laurent Villiers
S.P. 91427
00229 Armées
TAHITI-POLYNESIE FRANCAISE

John Wells
Faculty of Science
Victoria University of Wellington
P.O. Box 600
Wellington
NEW ZEALAND

NEW OR REINSTATED MEMBERS

John Wells has been appointed Dean of the Faculty of Science at Wellington University. This posting will leave him little or no time for research, a sad loss to the meiofauna research community in general and to harpactic copepod taxonomy in particular.

Although it is always sad to hear of the loss of good meiofauna scientists to administration and industry, it is a pleasure to welcome new members, many of whom are just beginning their research careers.

Candice Hinkle–Conn
Dept Zoology and Physiology
202 Life Sciences Building
Louisiana State University
Baton Rouge LA 70803–1725
USA.

"I am working on a PhD degree under Dr. John Fleeger at LSU and my area of interest is gobies that feed on meiofauna in estuarine and saltmarsh areas. I look forward to being a member of I.A.M. and doing research on meiofauna."

Mark Holmes
National Museum of Ireland
Kildare Street
Dublin 2
EIRE

"As a graduate of Bristol University I am now at the School of Ocean Sciences studying phytal meiofauna. I am especially interested in the microaraphpods and am at present looking at community differences at three sites on Anglesey. By using a combination of artificial substrata, transplanting and culturing I shall be examining some of the effects of pollution on these communities.”

Nadia Papadopoulou
Marine Ecology Group
Institute of Marine Biology of Crete
P.O. Box 2214
71003 Iraklio
CRETE, GREECE

"I am a benthic ecologist collaborating in several multi-disciplinary projects in the Aegean Sea coordi-
nated by the Institute of Marine Biology of Crete (Director Prof. A. Eleftheriou). My particular interests are macrobenthic polychaetes and meiofaunus (general). Almost nothing is presently known about the meiofaunal assemblage in Cretan waters (Bill Hummon has recently described some littoral gastrotrich assemblages from Crete and mainland Greece) and consequently much of our current and future effort must involve the analysis of poorly or totally undefined benthic communities with the additional constraint of a limited specialist literature base. Hopefully, I and my colleagues may benefit from future collaboration with and advice from other experienced meiofaunal ecologists”.

Ann Vanreusel
Zoology Institute
Morphology Laboratory
University of Gent
Ledeganckstraat 35
B-9000 Gent
BELGIUM

Dominick Verschelde
University of Gent
Zoology Institute
Marine Biology Section
Ledeganckstraat 35
B-9000 Gent
BELGIUM

“The purpose of my PhD study is a systematic and morphological revision of the Desmodoridae (Nematoda). For that, the nematode collection of the University of Gent is at my disposal. Nevertheless, I would be very grateful to everyone who could lend me some nematodes of the families Draconematidae, Epsilonematidae and Desmodoridae for examination. Also, I can be helpful in solving systematic problems in this taxon”.

CORRECTION

The title and reference to the polychaete volume reviewed by Gunter Purschke on page 6 of Psammonalia No. 93 should have read as follows:


FUTURE MEETINGS

FIFTH INTERNATIONAL CONFERENCE ON COPEPODA

The World Association of Copepodologists will hold its Fifth International Conference on Copepoda at the University of Maryland, Baltimore Campus at Catonsville on 5–10 June 1993. A conference program existing of platform presentations integrated with poster sessions and focusing on contemporary problems in copepod biology is planned. Members of the local organizing committee are: Brian P Bradley, Chairman, Thomas E Bowman, Frank D Ferrari, John A Fornshell, Janet W Reid, T Chad Walter and Grace A Wynaard.

For more information about conference topics, registration, etc. contact:
Dr Brian P Bradley
Fifth International Conference on Copepoda
Department of Biological Sciences
University of Maryland, Baltimore Campus
Catonsville, MD 21228 USA
Fax: (301) 455–3875

CALL FOR PAPERS FOR SPECIAL EIMCO SESSION

“USE OF MEIOFAUNA IN APPLIED RESEARCH”

There will be a special session devoted to presentations on the use of meiofauna in environmental research on Friday morning during the conference. The objective of this session is to promote the use of meiofauna in applied studies. Topics will include: Field Pollution Studies, Laboratory Toxicity Studies, Meiofauna as Stress Indicators, and Comparison of Meiofaunal Responses With Other Groups. Please send a duplicate copy of your abstract to:
Paul Montagna
University of Texas at Austin
Marine Science Institute
P.O. Box 1287
Port Aransas, Texas 78373 USA
You can also submit the duplicate abstract via electronic mail using
Internet: PAUL@UTMSZO.UTEXAS.EDU, or Bitnet: PAUL@UTMSI.


Vinogradova, N.G., Galkin, S.W., Kamenskaya, O.E., Romanov, V.N. and Savilova, T.A. 1990. The characteristic of the bottom fauna from the continental coast of Namibia in the Benguela upwelling region (17.5°S–26°S) according to the data of the 43rd cruise of R/V “Akademik Kurchatov”. In: Biological and Geological Bottom Investigations in the South Atlantic. Transactions of the P.P. Shirshov Institute of Oceanology, 126, 45–60.


Plate 1 International Meiofauna Conference No. 1 – Tunisia