

DEEP-SEA RESEARCH PART I

Volume 117

S. ROMERO-ROMERO,
A. MOLINA-RAMÍREZ, J. HÖFER,
G. DUINEVELD, A. RUMÍN-CAPARRÓS,
A. SANCHEZ-VIDAL, M. CANALS and
J.L. ACUÑA

N. LEMAITRE, H. PLANQUETTE,
F. DEHAIRS, P. VAN DER MERWE,
A.R. BOWIE, T.W. TRULL,
E.C. LAURENCEAU-CORNEC,
D. DAVIES, C. BOLLINGER,
M. LE GOFF, E. GROSSTEFFAN and
F. PLANCHON

J.A. GONZÁLEZ, J.G. PAJUELO,
R. TRIAY-ORTELLA, R. RUIZ-DÍAZ,
J. DELGADO, A.R. GÓIS and
A. MARTINS

A.M. BURKETT, A.E. RATHBURN,
M. ELENA PÉREZ, L.A. LEVIN and
J.B. MARTIN

Y. LEE, E.J. YANG, J. PARK, J. JUNG,
T.W. KIM and S. LEE

I. FERNÁNDEZ-URRUZOLA,
N. OSMA, T.T. PACKARD,
F. MALDONADO and M. GÓMEZ

- 1 Seasonal pathways of organic matter within the Avilés submarine canyon: Food web implications
- 11 Impact of the natural Fe-fertilization on the magnitude, stoichiometry and efficiency of particulate biogenic silica, nitrogen and iron export fluxes
- 28 Latitudinal patterns in the life-history traits of three isolated Atlantic populations of the deep-water shrimp *Plesionika edwardsii* (Decapoda, Pandalidae)
- 39 Colonization of over a thousand *Cibicidoides wuellerstorfi* (foraminifera: Schwager, 1866) on artificial substrates in seep and adjacent off-seep locations in dysoxic, deep-sea environments
- 51 Physical-biological coupling in the Amundsen Sea, Antarctica: Influence of physical factors on phytoplankton community structure and biomass
- 61 **Spatio-temporal variability in the GDH activity to ammonium excretion ratio in epipelagic marine zooplankton**

(continued on backmatter)



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INDEXED/ABSTRACTED IN: Chemical Abstracts Services, BIOSIS Data, Engng Ind. INSPEC Data, Curr Cont ASCA, CAB Inter. Curr Cont/Agri Bio Env Sci, Curr Cont/Phys Chem & Earth Sci, Geo Abstr, Geo Bib & Index, SCISEARCH Data, Environ Per Bibl, Meteor & Geostrophys Abstr, Res Alert, Ocean Lit Rev, Marine Lit Review, Oceanbase, Current awareness in Biological Sciences, BIOBASE. Also covered in the abstract and citation database SCOPUS®. Full text available on ScienceDirect®.

Printed by Henry Ling Ltd., Dorchester, UK

489

Available online at www.sciencedirect.com

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0967-0637(201611)117:C;1-8

117

DEEP-SEA RESEARCH I VOL. 117 (2016) 1-138



Volume 117

November 2016

ISSN 0967-0637

DEEP-SEA RESEARCH PART I

Editors-in-Chief:

Igor Belkin

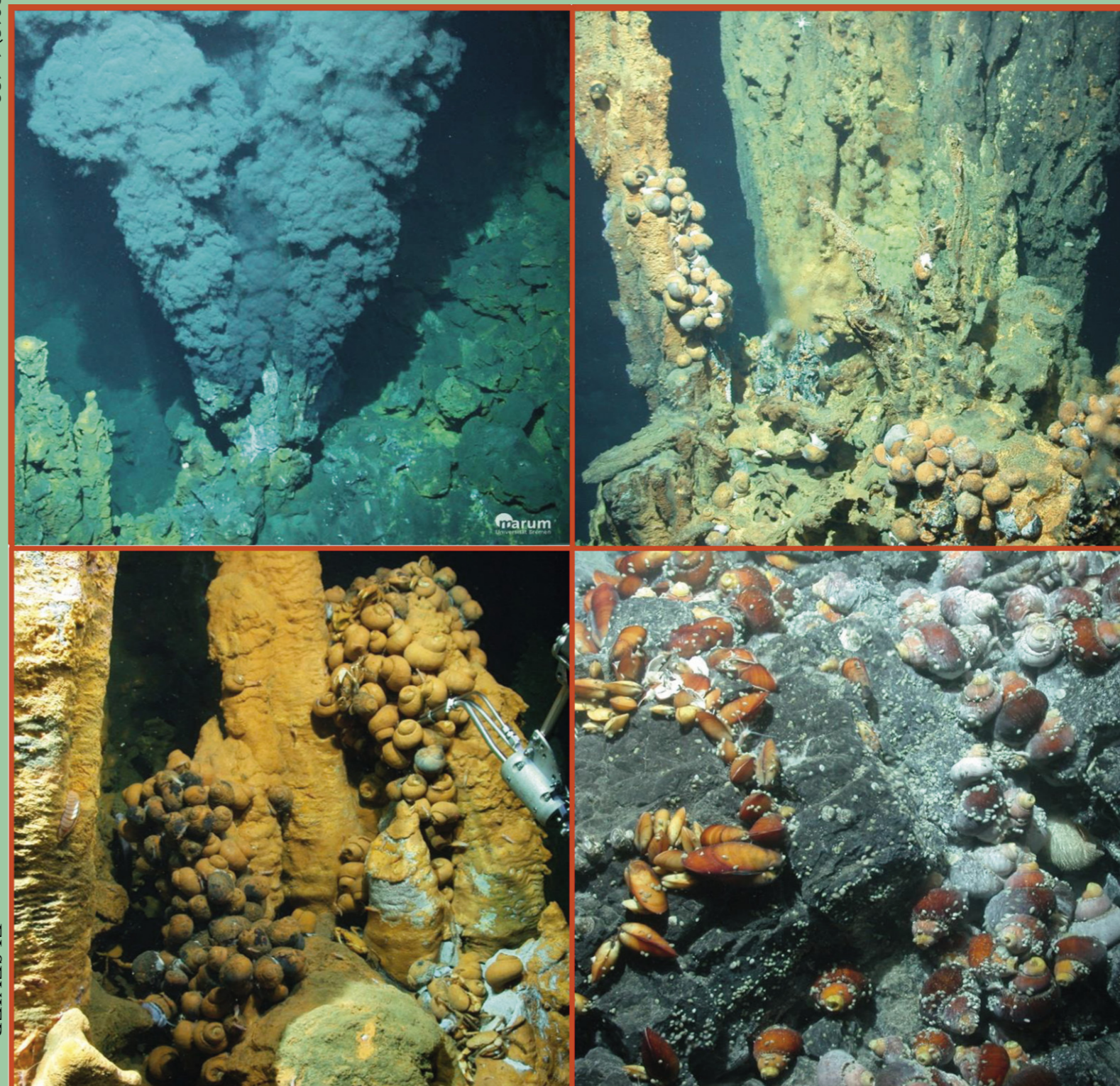
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Published annually in 12 issues. Information on published and forthcoming issues can be found at the journal web site.

Publication information: *Deep-Sea Research Part I* (ISSN 0967-0637). For 2016, volumes 107–118 are scheduled for publication. Subscription prices are available upon request from the Publisher or from the Elsevier Customer Service Department nearest you or from this journal's website (<http://www.elsevier.com/locate/dsri>). Further information is available on this journal and other Elsevier products through Elsevier's website: (<http://www.elsevier.com>). Subscriptions are accepted on a prepaid basis only and are entered on a calendar year basis. Issues are sent by standard mail (surface within Europe, air delivery outside Europe). Priority rates are available upon request. Claims for missing issues should be made within six months of the date of despatch.

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Cover Image: Deep-sea hydrothermal vent organism tissues can contain organic forms of arsenic such as arsenobetaine and arsenosugars (i.e., arsenoribosides), in addition to inorganic forms such as arsenite and arsenate. The inorganic forms are most likely bioaccumulated from vent fluids and/or seawater. Their primary food source, microbial mats, thus far have not been shown to contain organoarsenic species. Thus, to date it is unclear if deep-sea vent organisms bioaccumulate these compounds through the food web or directly biosynthesize them through some as yet unidentified pathway. Previous work on arsenoribosides suggest they are synthesized by photosynthesizing algae, whereas the biosynthesis pathway for arsenobetaine is unclear, even for near-surface organisms. Price et al. (this volume) describes the potential pathways by which deep-sea vent organisms can obtain organoarsenicals. Several fields in the Eastern Manus Basin were sampled during the RV Sonne cruise SO-216, including Roman Ruins and the Papua New Guinea-Australia-Canada-Manus hydrothermal system. The top left image shows a black smoker from Roman Ruins. Vent biota are mostly found around lower temperature areas near the base of black smokers and associated with diffuse vent fluids. The vent biota analyzed for the Price et al. study included the hairy gastropods *Alviniconcha hessleri* (top right), *Ifremeria nautilei* gastropods (bottom left) living on the flanks of a black smoker in the Roman Ruins hydrothermal field in low temperature shimmering hydrothermal fluids, and the mollusk *Bathymodiolus manusensis* (bottom right). All photos from MARUM©.

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