Jörg Dutz - DTU Orbit (15/01/2018)

Organisations

Section for Ocean Ecology and Climate
25/02/2012 → 18/01/2013 Former
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Visiting Scientist, National Institute of Aquatic Resources
15/03/2007 → 06/03/2017 Former
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23/01/2013 → 06/03/2017 Former
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Publications:

Documentation on key drivers and physiological tolerance limits for resident and invasive species: Report: BIO-C3 Deliverable, D1.2

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Marine Living Resources, Centre for Ocean Life, University of Tartu, University of Hamburg
Number of pages: 100
Publication date: 2016

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers version
DOIs: 10.3289/BIO-C3_D2.2
Links: http://oceanrep.geomar.de/32927/
Publication: Research › Report – Annual report year: 2016

Report on effects of changing drivers on pelagic and benthic species composition and production: Report: BIO-C3 Deliverable, D2.1

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Section for Marine Ecology and Oceanography, University of Copenhagen, DHI Denmark, University of Hamburg
Number of pages: 129
Publication date: 2016

Publication information
Dealing with the presence of the ciliate Euplotes sp. in cultures of the copepod Acartia tonsa

Ciliates in live feed cultures can be a pest that lower production yields. This could dramatically affect the management and success of copepod cultures. In this study, we investigated the effect of the ciliate Euplotes sp. on egg production, specific egg production and egg hatching success of Acartia tonsa fed with Rhodomonas salina. We found that at a concentration of 2 cells ml⁻¹, Euplotes sp. had no effect on the production and hatching success of eggs but increased/decreased the mortality/quality of non-subitaneous eggs. Euplotes sp. had a good fatty acid profile containing high proportion of unsaturated fatty acids, but the amount of fatty acids compared to their carbon weight was very low and, therefore, it was considered as a poor food source. We propose a short-term interruption of food supply to copepod cultures in order to mitigate bloom formation of ciliates. This will force copepods to feed on them actively as prey and therefore decrease their long-term negative effects. © 2013 Springer Science+Business Media Dordrecht.
KYSTFISK I. Udviklingen i kystnære fiskebestande. Slutrapport

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Ecology and Oceanography, Centre for Ocean Life, Section for Monitoring and Data
Authors: Støttrup, J. (Intern), Lund, H. S. (Ekstern), Munk, P. (Intern), Dutz, J. (Intern), Kindt-Larsen, L. (Intern), Egekvist, J. (Intern), Stenberg, C. (Intern), Nielsen, T. G. (Intern)
Number of pages: 21
Publication date: 2014

Publication information

Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.585 SNIP 0.763 CiteScore 1.08
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.553 SNIP 0.765 CiteScore 1.18
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.626 SNIP 0.796 CiteScore 1.17
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.599 SNIP 1.04 CiteScore 1.15
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.553 SNIP 0.857 CiteScore 0.99
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.533 SNIP 0.832
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.43 SNIP 0.775
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.488 SNIP 0.566
Scopus rating (2007): SJR 0.519 SNIP 0.73
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.603 SNIP 0.974
Scopus rating (2005): SJR 0.449 SNIP 0.536
Scopus rating (2004): SJR 0.424 SNIP 0.68
Scopus rating (2003): SJR 0.415 SNIP 0.699
Scopus rating (2002): SJR 0.258 SNIP 0.333
Scopus rating (2001): SJR 0.518 SNIP 0.649
Scopus rating (2000): SJR 0.48 SNIP 0.528
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.764 SNIP 0.959
Original language: English
Agronomy and Crop Science, Aquatic Science, Ciliate, Copepod, Egg production, Fatty acids, Hatching success
DOIs: 10.1007/s10499-013-9647-4
Source: Findit
Source-ID: 2197671295
Publication: Research - peer-review › Journal article – Annual report year: 2014
Where have all the coast fish gone?

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Ecology and Oceanography, Centre for Ocean Life, Section for Monitoring and Data
Authors: Støttrup, J. (Intern), Munk, P. (Intern), Lund, S. (Ekstern), Kindt-Larsen, L. (Intern), Dutz, J. (Intern), Egekvist, J. (Intern)
Publication date: 2014
Event: Poster session presented at Fisheries Dependant Information Conference, Rome, Italy.
Main Research Area: Technical/natural sciences
Publication: Research › Poster – Annual report year: 2014

A lasting legacy for the Baltic and North Sea GLOBEC Germany program

This preface introduces four manuscripts that form a special theme section of the GLOBEC Germany program within Progress in Oceanography. The four manuscripts link changes in physical forcing to the trophodynamic structure and function of the Baltic and North Seas. The target species of GLOBEC Germany included various species of calanoid copepods and a small pelagic fish (Sprattus sprattus)

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ocean Ecology and Climate, University of Hamburg, University of Kiel
Authors: Peck, M. (Ekstern), Dutz, J. (Intern), Voss, R. (Ekstern)
Pages: 1-2
Publication date: 2012
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Progress in Oceanography
Volume: 107
ISSN (Print): 0079-6611
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.4 SJR 1.922 SNIP 1.278
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.703 SNIP 1.348 CiteScore 3.34
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.909 SNIP 1.461 CiteScore 3.65
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Effects of ocean acidification, temperature and nutrient regimes on the appendicularian Oikopleura dioica: a mesocosm study

Increasing pCO2 is hypothesized to induce shifts in plankton communities toward smaller cells, reduced carbon export rates and increased roles of gelatinous zooplankton. Appendicularians, among the most numerous pan-global "gelatinous" zooplankton, continuously produce filter-feeding houses, shortcutting marine food webs by ingesting submicron particles, and their discarded houses contribute significantly to carbon fluxes. We present a first mesocosm-scale study on the effects of temperature, pCO2 and bloom structures on the appendicularian, Oikopleura dioica. There were effects of temperature and nutrients on phytoplankton communities. No shifts in functional phytoplankton groups, nor changes in particle sizes/morphotypes, known to impact appendicularian feeding, were observed under manipulated pCO2 conditions. However, appendicularian abundance was positively correlated with increased pCO2, temperature and nutrient levels, consistent with hypotheses concerning gelatinous zooplankton in future oceans. This suggests appendicularians will play more important roles in marine pelagic communities and vertical carbon transport under projected ocean acidification and elevated temperature scenarios.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Skidaway Institute of Oceanography, Aarhus University, Uni Research AS, Universidad de Oviedo, University of Zagreb, Russian Academy of Sciences, Technical University of Denmark, University of Bergen, University of Gothenburg
Authors: Troedsson, C. (Ekstern), Bouquet, J. (Ekstern), Lobon, C. M. (Ekstern), Novac, A. (Ekstern), Nejstgaard, J. C. (Ekstern), Dupont, S. (Ekstern), Bosak, S. (Ekstern), Jakobsen, H. H. (Intern), Romanova, N. (Ekstern), Pankoke, L. M.
Incorporation of nitrogen from \(\text{N}_2\) fixation into amino acids of zooplankton

Eurytemora affinis (Copepoda) were fed \(15\text{N}\)-labeled Rhodomonas salina (Cryptophyta) or \(15\text{N}\)-labeled Nodularia spumigena (Cyanobacteria) in excess under controlled laboratory conditions. Zooplankton collected from the Baltic Sea were fed natural phytoplankton amended with \(15\text{N}\)-labeled \(N\). spumigena. We quantified the direct incorporation of \(15\text{N}\) tracer from \(\text{N}_2\)-fixing \(N\). spumigena (diazotroph nitrogen) and ammonium-utilizing \(R\). salina into the amino acid nitrogen (AA-N) of zooplankton using complementary gas chromatography–combustion–isotope ratio mass spectrometry, gas chromatography–mass spectrometry, and elemental analysis–isotope ratio mass spectrometry approaches. Specific and mass-specific TN and AA-N incorporation rates of the \(15\text{N}\) tracers were calculated for zooplankton. Highest incorporation of \(15\text{N}\) was found in field zooplankton relying on \(N\). spumigena and in \(E\). affinis relying on \(R\). salina. Lowest incorporation was found in \(E\). affinis relying on \(N\). spumigena. Decreasing specific and mass-specific rates during field experiments possibly were due to food shortage, whereas decreasing rates in \(E\). affinis grazing on \(R\). salina were more likely due to satiation. Specific and mass-specific rates were consistently low in \(E\). affinis when exposed to \(N\). spumigena, suggesting that these animals were reluctant to feed on \(N\). spumigena. Essential isoleucine received most of the diazotroph nitrogen in field zooplankton, while nonessential amino acids received most \(15\text{N}\) tracer in \(E\). affinis. \(N\). spumigena was clearly an important amino acid nitrogen source for Baltic Sea zooplankton.

General information

State: Published
Organizations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Loick-Wilde, N. (Ekstern), Dutz, J. (Intern), Miltner, A. (Ekstern), Gehre, M. (Ekstern), Montoya, J. P. (Ekstern), Voss, M. (Ekstern)
Pages: 199-210
Publication date: 2012
Main Research Area: Technical/natural sciences

Publication information
Journal: Limnology and Oceanography
Volume: 57
Issue number: 1
ISSN (Print): 0024-3590
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.5 SJR 1.712 SNIP 1.225
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.472 SNIP 1.422 CiteScore 3.93
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.112 SNIP 1.584 CiteScore 3.73
BFI (2013): BFI-level 2
The seasonal cycle of reproduction in Temora longicornis was investigated in the Bornholm Basin, Baltic Sea, from March 2002 to May 2003. Variations in egg production of the population (EPR) and spawning females (sfEPR, ~ clutch size), proportion of spawning females (%FS), egg hatching success (HS), female prosome length (PL) and weight-specific egg production (spEPR) were compared with the seasonal variations in temperature, salinity, and food concentration and composition. Females reproduced year round with maxima of 9.8 to 12.3 eggs female−1 d−1 in spring and low to moderate egg production during the remaining seasons. PL was maximal during spring, and %FS, sfEPR and spEPR paralleled egg production. HS was low during winter and increased in spring. The statistical analyses showed that mean egg production correlated with both sfEPR and %FS. While %FS was significantly related to food concentration, sfEPR was dependent on both food availability and PL, which in turn was inversely related to temperature. Salinity had no effect on the seasonal variation in egg production because females maintained their vertical position in water with low seasonal amplitudes in salinity and temperature, presumably to avoid high energetic costs due to osmoregulation under fluctuating salinity. Nevertheless, the costs due to osmoregulation during development likely resulted in small female PL, and thus
indirectly affected reproduction. Using empirical non-linear regression, 80% of the seasonal variation in egg production of T. longicornis was explained by female length and food concentration. However, despite the pronounced seasonal variation in egg production, the recruitment of nauplii was continuously high except throughout the productive season, indicating that a low reproductive success was offset by female abundance.

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ocean Ecology and Climate
Authors: Dutz, J. (Intern), van Beusekom, J. (Ekstern), Hinrichs, R. (Ekstern)
Pages: 51-66
Publication date: 2012
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Marine Ecology - Progress Series Online
Volume: 462
ISSN (Print): 1616-1599
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.4
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 2.56
Web of Science (2015): Indexed yes
Scopus rating (2014): CiteScore 2.75
Web of Science (2014): Indexed yes
Scopus rating (2013): CiteScore 2.79
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
Scopus rating (2012): CiteScore 2.9
ISI indexed (2012): ISI indexed no
Web of Science (2012): Indexed yes
Scopus rating (2011): CiteScore 2.85
ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
Web of Science (2010): Indexed yes
Web of Science (2009): Indexed yes
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2001): Indexed yes
Web of Science (2000): Indexed yes
Original language: English
Electronic versions:
m462p051.pdf
DOIs:
10.3354/meps09830
Source: dtu
Source-ID: n:oat:DTIC-ART:intres/368129994::19474
Publication: Research - peer-review › Journal article – Annual report year: 2012

**Spatial and temporal habitat partitioning by zooplankton in the Bornholm Basin (central Baltic Sea)**
The deep basins in the Baltic Sea such as the Bornholm Basin (BB) are subject to seasonal changes in the strength of physico-chemical stratification. These depth-related changes in key abiotic factors are strong drivers of habitat partitioning by the autochthonous zooplankton community. Species-specific ecophysiological preferences often result in both seasonal
and inter-annual changes in vertical abundance that, when combined with depth-specific water currents, also lead to horizontal differences in spatial distribution. The present study documented the seasonal and depth-specific changes in the abundance and species composition of zooplankton in the BB based upon broad-scale survey data: 832 vertically-resolved (10 m) multinet samples collected at nine stations between March 2002 and May 2003. Changes in the zooplankton community were significantly correlated with changes in ambient hydrography. Each of five taxa (Bosmina coregoni maritima, Acartia spp., Pseudocalanus spp., Temora longicornis, Synchaeta spp.) contributed >10% to the zooplankton community composition. The appearance of cladocerans was mainly correlated with the phenology of thermocline development in the spring. The cladoceran B. coregoni maritima was a dominant member of this community during the warmest periods, preferring the surface waters above the thermocline. Copepods exhibited distinct, ontogenetic and seasonal changes in their distribution. The rotifers (Synchaeta sp.) were the most abundant zooplankton in May. Based on a multivariate approach and the evaluation of vertical distribution patterns, five major habitat utilisation modes were identified that were based, to a large extent, on the dynamics of thermal and haline stratification of the Baltic Sea. Our statistical analysis of one of the most thorough datasets collected on Baltic zooplankton in recent decades reveals some of the factors that make this stratified system highly dynamic with respect to the spatial overlap between predators and prey. As fish and gelatinous plankton often feed in distinct layers and/or exhibit feeding migrations, the inhomogeneous distribution of potential prey can result in a spatial mismatch. Based on the five modes identified at the community level for zooplankton, we discuss how climate-driven hydrographic variability may influence the strength of trophic coupling within the Bornholm Basin.

**General information**

State: Published
Organisations: National Institute of Aquatic Resources, Section for Ocean Ecology and Climate, Carl Von Ossietzky University Oldenburg, Alfred Wegener Institute for Polar and Marine Research, Thünen Institute of Baltic Sea Fisheries, Christian Albrechts University, University of Rostock, CEN Center for Earth System Research and Sustainability, Senckenberg Research Institute, Novartis Animal Health, Institute for Baltic Research
Authors: Schultz, J. (Ekstern), Peck, M. (Ekstern), Barz, K. (Ekstern), Schmidt, J. (Ekstern), Hansen, F. (Ekstern), Peters, J. (Ekstern), Renz, J. (Ekstern), Dickmann, M. (Ekstern), Mohrholz, V. (Ekstern), Dutz, J. (Intern), Hirche, H. (Ekstern)
Pages: 3-30
Publication date: 2012
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Progress in Oceanography
Volume: 107
ISSN (Print): 0079-6611
Ratings:

- BFI (2018): BFI-level 2
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 2
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 3.4 SJR 1.922 SNIP 1.278
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 1.703 SNIP 1.348 CiteScore 3.34
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 1.909 SNIP 1.461 CiteScore 3.65
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 2.397 SNIP 1.595 CiteScore 3.87
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 2.741 SNIP 1.794 CiteScore 4.17
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 2.279 SNIP 1.341 CiteScore 3.41
- ISI indexed (2011): ISI indexed yes
The effect of egg versus seston quality on hatching success, naupliar metabolism and survival of Calanus finmarchicus in mesocosms dominated by Phaeocystis and diatoms

We studied the effect of a developing Skeletonema marinoi/Phaeocystis spp. bloom on Calanus finmarchicus hatching success, early naupliar survival and metabolism. Our focus was (1) on the development of reproductive rates during a bloom initiation, peak and decline in relation to the production of potentially toxic algal metabolites and (2) on the proportional importance of female nutrition versus naupliar food environment for the production of viable nauplii. Despite polyunsaturated aldehyde (PUA) production by both S. marinoi and Phaeocystis sp., we did not observe any harmful effects on hatching success or naupliar survival and condition in any stages of the short-term.
BFI (2015): BFI-level 1  
Scopus rating (2015): SJR 1.315 SNIP 0.932 CiteScore 2.21  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 1  
Scopus rating (2014): SJR 1.204 SNIP 1.041 CiteScore 2.32  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): SJR 1.272 SNIP 1.064 CiteScore 2.4  
ISI indexed (2013): ISI indexed yes  
BFI (2012): BFI-level 1  
Scopus rating (2012): SJR 1.306 SNIP 1.107 CiteScore 2.43  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): SJR 1.145 SNIP 1.073 CiteScore 2.22  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 1.235 SNIP 1.069  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 1.178 SNIP 1.052  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 1.236 SNIP 1.022  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.348 SNIP 1.21  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 1.195 SNIP 1.09  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 1.253 SNIP 1.198  
Web of Science (2005): Indexed yes  
Scopus rating (2004): SJR 1.392 SNIP 1.228  
Web of Science (2004): Indexed yes  
Scopus rating (2003): SJR 1.333 SNIP 1.274  
Web of Science (2003): Indexed yes  
Scopus rating (2002): SJR 1.268 SNIP 1.19  
Web of Science (2002): Indexed yes  
Scopus rating (2001): SJR 1.241 SNIP 1.158  
Web of Science (2001): Indexed yes  
Scopus rating (2000): SJR 1.22 SNIP 1.124  
Web of Science (2000): Indexed yes  
Scopus rating (1999): SJR 1.448 SNIP 1.303  
Original language: English  
DOIs:  
10.1007/s00227-011-1843-z  
Source: orbit  
Source-ID: 314174  
Publication: Research - peer-review › Journal article – Annual report year: 2011

Copepods and the biological pump: The potential effects of large vs. small copepods on vertical flux

General information
State: Published  
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Does the allelopathic and toxic activity of Alexandrium minutum change with ocean acidification?

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Dutz, J. (Intern), Ceballos, S. (Intern), Isla, A. (Ekstern), Selander, E. (Intern)
Publication date: 2011
Event: Abstract from 5th International Zooplankton Production Symposium, Púcon, Chile.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 281338
Publication: Research › Conference abstract for conference – Annual report year: 2011

Effects of suspended sediments on copepods feeding in a glacial influenced sub-Arctic fjord

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Arendt, K. E. (Ekstern), Dutz, J. (Intern), Jonasdottir, S. (Intern), Jung-Madsen, S. (Intern), Mortensen, J. (Ekstern), Møller, E. F. (Ekstern), Nielsen, T. G. (Intern)
Pages: 1526-1537
Publication date: 2011
Main Research Area: Technical/natural sciences
Publication information
Journal: Journal of Plankton Research
Volume: 33
Issue number: 10
ISSN (Print): 0142-7873
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.92 SJR 1.096 SNIP 0.848
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.025 SNIP 0.796 CiteScore 1.77
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.095 SNIP 1.255 CiteScore 2.24
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.289 SNIP 1.109 CiteScore 2.39
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Extensive cross-disciplinary analysis of biological and chemical control of Calanus finmarchicus reproduction during an aldehyde forming diatom bloom in mesocosms

Egg and faecal pellet production and egg hatching success of the calanoid copepod Calanus finmarchicus were monitored over a period of 14 days (14-28 April, 2008) while fed water from 4 differently treated mesocosms and ambient water. Two of the mesocosms used were inoculated with the polyunsaturated aldehyde (PUA)-producing diatom Skeletonema marinoi, while 2 received only nutrient additions with or without silica. The mesocosms developed blooms of S. marinoi, mixed diatoms or the haptophyte Phaeocystis pouchetii, respectively. Faecal pellet production of C. finmarchicus increased with increasing food availability. Egg production increased with time in all mesocosms to a maximum single female production of 232 eggs female\(^{-1}\) day\(^{-1}\) (average of 90 eggs female\(^{-1}\) day\(^{-1}\)) and followed the development of ciliates and P. pouchetii, but was not affected by the observed high (up to 15 nmol L\(^{-1}\)) PUA production potential of the phytoplankton. The hatching success of the eggs produced on the mesocosm diets was high (78-96%) and was not affected by either aldehydes in the maternal diet or exposure to the dissolved aldehydes in the water.

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Factors controlling the seasonal dynamics of fecundity and recruitment of Temora longicornis in the Baltic Sea

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Dutz, J. (Intern), van Beusekom, J. (Ekstern), Hinrichs, R. (Ekstern)
Publication date: 2011
Event: Abstract from 5th International Zooplankton Production Symposium, Púcon, Chile.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 281341
Publication: Research › Conference abstract for conference – Annual report year: 2011


General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources, Unknown
Publication date: 2010

Publication information
Place of publication: Aarhus
Publisher: National Environment Research Institute, Aarhus University
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 281336
Publication: Research › Report – Annual report year: 2008

Life cycle and spring phenology of Temora longicornis in the Baltic Sea
The seasonal variation in abundance, biomass and vertical distribution of nauplii and copepodites of Temora longicornis in the Bornholm Basin was studied from March 2002 to May 2003 to understand the overwintering, spring development and life cycle of this species in the Baltic Sea. The analysis of the life cycle by means of stage structure, copepodite length and stage duration revealed that T. longicornis produced 5 to 6 generations yr⁻¹. The species overwintered in low abundance as an active, slowly developing generation with adults appearing from February/March onwards. The onset of the spring bloom in April triggered reproduction and initiated the first spring generation (G1) with a strong rise in nauplii abundance. The stock biomass increased in May with the occurrence of the copepodites of G1 and remained high during the succeeding generations G2 and G3 until August. The stock was distributed in the upper, brackish 30 to 60 m of the water column. In summer, copepodite stages concentrated in the cool intermediate water during daytime and migrated to the surface at night. This seasonal submergence explains the persistence of T. longicornis in the Bornholm Basin throughout the year because the average temperature experienced by the population was low (5 to 14°C) compared with the unfavourable warm surface temperatures (>20°C). The study further showed that the timing of the spring biomass increase of the species is associated with the maturation of the first generation and can vary considerably between years. A delay of ~1 mo was observed in 2003 when environmental conditions during the cohort development were unfavourable. We conclude that the spring development of T. longicornis is complex and depends not only on prevailing temperatures, but also on spring bloom timing and post-bloom food availability.
**Seasonal changes in food quantity and quality of the common North Sea copepods Temora longicornis and Pseudocalanus elongatus: a bioassay approach**

We evaluated the food quantity and quality over a seasonal cycle for the development and egg production of the common North Sea copepods Temora longicornis and Pseudocalanus elongatus, using a bioassay approach. Seston was sampled from December to October from a well-mixed water column of the Marsdiep (Dutch Wadden Sea) and fed to cultured copepods at a constant temperature of 15 degrees C, thus excluding seasonal effects of temperature, body size, age, and maternal nutrition. Copepod response was evaluated by measuring egg production and juvenile development, while the seston quantity and quality were measured as the concentrations of chl a, specific phytoplankton pigments, particulate organic carbon (POC), particulate organic nitrogen (PON), fatty acids, and sterols. The egg production of both copepods was low when feeding on seston collected in winter, but increased to peak values with the seston from the spring bloom in March-April. The juveniles of both species were able to complete their development only in spring experiments. A multiple regression analyses and comparison to a good-quality standard food of the same concentration suggested that, in an annual scale, the egg production and development of T longicornis mainly depended on phytoplankton concentration, while the egg production and development of P. elongatus appeared also to benefit from detritus or heterotrophic food sources. The present study did not detect an influence of a specific food quality variable; however, an unexplained high juvenile mortality in summer suggests that all factors are not understood yet.

**General information**

*State:* Published  
*Organisations:* Section for Ocean Ecology and Climate, National Institute of Aquatic Resources  
*Authors:* Koski, M. (Intern), Dutz, J. (Intern), Klein Breteler, W. (Ekstern), Rampen, S. (Ekstern), Noordeloos, A. (Ekstern)  
*Pages:* 141-155  
*Publication date:* 2010  
*Main Research Area:* Technical/natural sciences

**Publication information**  
*Journal:* Marine Ecology - Progress Series  
*Volume:* 399  
*ISSN (Print):* 0171-8630  
*Ratings:*  
  BFI (2018): BFI-level 2  
  Web of Science (2018): Indexed yes  
  BFI (2017): BFI-level 2  
  Web of Science (2017): Indexed yes  
  BFI (2016): BFI-level 2  
  Scopus rating (2016): CiteScore 2.4  
  Web of Science (2016): Indexed yes  
  BFI (2015): BFI-level 2  
  Scopus rating (2015): CiteScore 2.56  
  Web of Science (2015): Indexed yes  
  BFI (2014): BFI-level 2  
  Scopus rating (2014): CiteScore 2.75  
  Web of Science (2014): Indexed yes  
  BFI (2013): BFI-level 2  
  Scopus rating (2013): CiteScore 2.79  
  ISI indexed (2013): ISI indexed yes  
  Web of Science (2013): Indexed yes  
  BFI (2012): BFI-level 2  
  Scopus rating (2012): CiteScore 2.9  
  ISI indexed (2012): ISI indexed yes  
  Web of Science (2012): Indexed yes  
  BFI (2011): BFI-level 2  
  Scopus rating (2011): CiteScore 2.85  
  ISI indexed (2011): ISI indexed yes  
  Web of Science (2011): Indexed yes  
  BFI (2010): BFI-level 2  
  Web of Science (2010): Indexed yes
Effects of carbon-dioxide-induced acidification on algal quality for copepod reproduction

Copepod reproduction is unaffected by diatom aldehydes or lipid composition

We investigated whether reduced reproductive success of copepods fed with diatoms was related to nutritional imbalances with regard to essential lipids or to the production of inhibitory aldehydes. In 10-d laboratory experiments, feeding, egg production, egg hatching success, and fecal pellet production of Temora longicornis were measured for six different diatom species as well as for a nondiatom control diet (Rhodomonas sp.). The experiments were accompanied by determinations of fatty acids, sterols, and polyunsaturated aldehydes (PUA) in the food. Although diatoms were generally ingested at high rates, they yielded a variable egg production response in copepods, ranging from high egg production in four species (two strains of Thalassiosira rotula, Chaetoceros affinis, and Thalassiosira weissflogii) to low egg production in two species (Leptocylindricus danicus and Skeletonema costatum). Egg hatching rates decreased after 4 d in all diatom treatments, irrespective of the egg production rate and without any relationship to diatom aldehyde production. Similarly, no evidence was found that diatoms are per se nutritionally inferior to nondiatom food. The lack of a distinct mechanism for the observed inhibitory activity of diatoms suggests that the cause(s) might be more complex. We suggest, as one possible explanation, that hatching-specific nutritional deficiencies might be induced by incomplete digestion following from the low gut passage time of diatoms, as indicated by a strong correlation between egg viability and fecal pellet production.
Importance and nutritional value of large ciliates for the reproduction of Acartia clausi during the post spring-bloom period in the North Sea

Shipboard experiments were performed to examine the qualitative importance of large marine microzooplankton for the reproduction of Acartia clausi in the North Sea. Feeding and egg production were compared in 2 treatments in which females were fed natural seston or natural seston selectively enriched with large prey (> 20 μm). The mineral (C, N) and lipid contents of the food suspensions were determined for size-fractionated samples to characterize the nutritional composition of prey. Large oligotrich ciliates and Strobiliidae dominated the seston biomass. Ciliates, particularly the oligotrich Laboea strobila, were the preferred food and made up more than 86 % of the diet (2.9 μg C female(-1) d(-1)), achieving maximum rates recorded for this species in the North Sea. Egg production was high (> 25 eggs female(-1) d(-1)), allowing calculation of the gross growth efficiency for egg production on a diet of mixed ciliates, which was high at similar to 30%.

Measurements of the mineral and lipid content confirmed a high seston nutritional quality. The 20 to 48 μm fraction reflected the composition of female diets and indicated an enrichment of N and polyunsaturated fatty acids (PUFA) in the diet compared to total seston. The fraction > 48 μm m consisted mostly of ciliates (> 97 %) and was particularly important in providing N to copepods. Ciliates were also rich in PUFA and eicosapentaenoic acid (EPA), which is normally characteristic of diatoms. We conclude that large ciliates constitute an excellent food source for the reproduction of A. clausi. The occurrence of biomass peaks of large ciliates following the spring diatom bloom probably contributes substantially to the spring recruitment of the species in the North Sea.

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Dutz, J. (Intern), Peters, J. (Ekstern)
Pages: 261-277
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: Aquatic Microbial Ecology
Volume: 50
Issue number: 3
ISSN (Print): 0948-3055
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.805 SNIP 0.567 CiteScore 1.77
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.124 SNIP 0.768 CiteScore 2.21
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.893 SNIP 0.699 CiteScore 1.88
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.021 SNIP 0.844 CiteScore 2.16
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.389 SNIP 0.921 CiteScore 2.49
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.423 SNIP 0.879 CiteScore 2.45
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.282 SNIP 0.888
Role of essential fatty acids on the reproductive success of the copepod Temora longicornis in the North Sea

This field study focused on the transfer of dietary fatty acids (FAs) into the eggs of Temora longicornis and assessed their potential for limiting egg production and egg viability. In situ egg production rates (EPRs), hatching success and FA profiles of females, as well as eggs, were determined and compared to food indicators, i.e. particulate organic carbon, particulate organic nitrogen and FAs of size-fractionated seston samples. Individual egg production ranged from 14 to 28 eggs female(-1) d(-1), corresponding to weight-specific egg production rates (sEPRs) from 0.18 to 0.35. Based on trophic marker FAs, T. longicornis most likely fed non-selectively. FA contents of eggs ranged from 2.6 to 4.3 ng egg(-1) and correlated significantly with the FA content in seston (size class: 1 to 30 μm). Strong similarities in FA profiles of eggs and seston, as well as correlations of absolute FA levels, indicated only minor maternal regulation of egg composition. The significant increase in EPRs with an increasing diatom food supply, as indicated by correlation with 16:1 (n-7) levels in seston and eggs, strongly compensated for the tendency to produce less viable eggs on a diatom-dominated diet. Egg viability was overall very high (77 to 94 %) at all our stations and did not relate to essential FA levels in the eggs, indicating that lipids were transferred in sufficient quantities. Thus, food quantity rather than quality determined the reproductive success of T. longicornis during our study. Stoichiometric comparisons between seston and egg composition suggested that nitrogen-containing compounds had a higher potential for limiting egg production during our study than essential FAs.

General information
State: Published
Organisations: Leibniz-Institute for Baltic Sea Research, University of Bremen
Authors: Peters, J. (Ekstern), Dutz, J. (Intern), Hagen, W. (Ekstern)
Pages: 153-163
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Ecology Progress Series
Volume: 341
ISSN (Print): 0171-8630
Ratings:
Zooplankton grazing on Phaeocystis: a quantitative review and future challenges

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Nejstgaard, J. (Ekstern), Tang, K. (Ekstern), Steinke, M. (Ekstern), Dutz, J. (Intern), Koski, M. (Intern), Antajan, E. (Ekstern), Long, J. (Ekstern)
Pages: 147-172
Publication date: 2007
Main Research Area: Technical/natural sciences
Copepods coping with a tough situation temperature, salinity and calanoid vital rates in the Baltic Sea

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Peck, M. (Ekstern), Holste, L. (Ekstern), Dutz, J. (Intern), St. John, M. (Intern)
Pages: 69-71
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: GLOBEC International Newsletter
Issue number: 12
Original language: English
Source: orbit
Source-ID: 281331
Publication: Research › Journal article – Annual report year: 2003

The impact of exceptionally warm summer inflow events on the environmental conditions in the Bornholm Basin

General information
State: Published
Organisations: Institut für Ostseeforschung
Authors: Mohrholz, V. (Ekstern), Dutz, J. (Intern), Kraus, G. (Ekstern)
Pages: 285-301
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Marine Systems
Volume: 60
Issue number: 3-4
ISSN (Print): 0924-7963
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.403 SNIP 1.282 CiteScore 2.61
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.093 SNIP 1.033 CiteScore 2.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.231 SNIP 1.494 CiteScore 2.69
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.609 SNIP 1.457 CiteScore 2.99
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.534 SNIP 1.276 CiteScore 2.51
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.51 SNIP 1.289 CiteScore 2.43
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.43 SNIP 1.122
Trophic significance of solitary cells of the prymnesiophyte Phaeocystis globosa depends on cell type

With the use of five different isolates of Phaeocystis globosa solitary cells from the North Sea, we conducted experiments to reveal whether grazing and development of the nauplii of the calanoid copepod Temora longicornis varies in response to the cell type. Two P. globosa strains representing nonflagellated cells were ingested at intermediate to high rates and resulted in high survival and development, comparable to the Rhodomonas sp. control. In contrast, the response to three mesoflagellate strains was highly variable. Feeding on two of these strains was avoided, whereas the third strain was ingested; however, the mesoflagellates induced poor survival and development regardless of the feeding response. These observations differ from previous results, which generally demonstrate microzooplankton feeding on Phaeocystis. The morphological characterization of strains, together with mixture experiments, revealed that neither the production of transparent exopolymer particles and chitinous threads nor toxicity can explain the observed response. The cohesion of the threads into pentagonal stars was observed only in the avoided mesoflagellate and might cause a mechanical hindrance for the ingestion of mesoflagellates. Our results suggest that grazing loss and trophic transfer efficiency might be overestimated when solitary cells are treated as a single functional group with regard to their trophic position.

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Dutz, J. (Intern), Koski, M. (Intern)
Pages: 1230-1238
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Limnology and Oceanography
Volume: 51
Issue number: 3
ISSN (Print): 0024-3590
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
Inhibition of copepod feeding by exudates and transparent exopolymer particles (TEP) derived from a Phaeocystis globosa dominated phytoplankton community

We investigated if (1) dissolved compounds excreted by Phaeocystis globosa and (2) transparent exopolymer particles (TEP) formed from carbohydrates excreted into the water affect the feeding of nauplii and females of the calanoid copepod Temora longicornis during a P. globosa bloom. Copepod grazing on the diatom Thalassiosira weissflogii in the presence of these possible grazing deterrents was measured during three successive weeks of a mesocosm study, simulating the development of a P. globosa bloom. Our results demonstrate no indication for the presence of feeding deterrents in the dissolved phase, but a strong inhibitory effect of transparent exopolymer particles (TEP) on the consumption of algae by both nauplii and adult copepods. The inhibitory effect of TEP was connected to the accumulation of DOM during the progress of the bloom. We suggest that a reduction in the grazing pressure of zooplankton may increase the survival of the liberated single cells during disruption of colonies and allow seeding populations to persist. Furthermore, P. globosa reduces the trophic efficiency of the food web not only by withdrawal of its colonies from grazing but also by a relaxation of the grazing pressure on co-occurring phytoplankton and by alteration of the food web structure via TEP production.

General information
State: Published
Organisations: Royal Netherlands Institute for Sea Research - NIOZ
Authors: Dutz, J. (Intern), Klein Breteler, W. (Ekstern), Kramer, G. (Ekstern)
Pages: 929-940
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Harmful Algae
Volume: 4
Issue number: 5
ISSN (Print): 1568-9883
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.98 SJR 1.04 SNIP 1.243
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.612 SNIP 1.439 CiteScore 3.56
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.542 SNIP 1.712 CiteScore 3.66
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.202 SNIP 1.444 CiteScore 3.38
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.211 SNIP 1.487 CiteScore 3.57
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.767 SNIP 1.686 CiteScore 3.53
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.369 SNIP 1.704
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.218 SNIP 1.299
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.15 SNIP 1.447
Scopus rating (2007): SJR 1.197 SNIP 1.218
Scopus rating (2006): SJR 1.226 SNIP 1.528
Selective grazing of Temora longicornis in different stages of a Phaeocystis globosa bloom - a mesocosm study

Selective grazing of a calanoid copepod Temora longicornis was measured during different stages of a Phaeocystis globosa bloom, in order to reveal (1) if T longicornis feeds on single cells and/or colonies of P. globosa in the presence of alternative food sources, (2) if copepod food selection changes during the initiation, maintenance, collapse and decay of a P. globosa bloom and (3) if P. globosa dominated food assemblage provides a good diet for copepod egg production. Our results show low but constant feeding on small colonies of P. globosa, irrespective of the type or concentration of alternative food sources. In contrast, feeding on single cells was never significant, and the total contribution of P globosa to carbon ingestion of T longicornis was minor. T longicornis fed most actively on the decaying colonies, whereas during the peak of the bloom copepods selected against P globosa. Mostly, T longicornis fed unselectively on different food particles: before the bloom, the major part of the diet consisted of diatoms, whereas during and after the bloom copepod diet was dominated by dinoflagellates and ciliates. Egg production was highest during the decay of the bloom, coinciding with highest proportional ingestion of heterotrophic organisms, but was not seriously reduced even during the peak of the bloom. We conclude that P globosa blooms should not threaten survival of copepod populations, but the population recruitment may depend on the type (and concentration) of the dominant heterotrophs present during the blooms. Due to relatively unselective grazing, the impact of T longicornis to the initiation of a Phaeocystis bloom is considered small, although grazing on decaying colonies may contribute to the faster termination of a bloom. (C) 2005 Elsevier B.V. All rights reserved.
Synchronous ecological regime shifts in the Central Baltic and the North Sea in the late 1980s

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Alheit, J. (Ekstern), Möllmann, C. (Ekstern), Dutz, J. (Intern), Kornilovs, G. (Ekstern), Loewe, P. (Ekstern), Mohrholz, V. (Ekstern), Wasmund, N. (Ekstern)
Pages: 1205-1216
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES Journal of Marine Science
Volume: 62
Issue number: 7
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Identification of critical stages in the population dynamics of key copepod species in the Bornholm Basin (Baltic Sea): potential linkages to physical forcing and climate variability

General information
State: Published
Organisations: Alfred Wegener Institute for Polar and Marine Research, University of Bremen, Leibniz-Institute for Baltic Sea Research
Authors: Dutz, J. (Intern), Mohrholz, V. (Ekstern), Peters, J. (Ekstern), Renz, J. (Ekstern), Alheit, J. (Ekstern)
Pages: 1-11
Publication date: 2004

Host publication information
Title of host publication: ICES C.M.
Volume: L:12
Place of publication: Copenhagen
Publisher: International Council for the Exploration of the Sea
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 281330
Publication: Research › Article in proceedings – Annual report year: 2004

Synchronous ecological regime shifts in the North and Central Baltic Sea in 1988/89

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources
Authors: Alheit, J. (Ekstern), Möllmann, C. (Ekstern), Dutz, J. (Intern), Feistel, R. (Ekstern), Kornilovs, G. (Ekstern), Mohrholz, V. (Ekstern), Wasmund, N. (Ekstern)
A strong impact of winter temperature on spring recruitment of a key copepod species in the Bornholm Basin

Selective feeding of Temora longicornis adults vs. nauplii in a Phaeocystis dominated mesocosm

Strain-specific grazing and development on Phaeocystis globosa by nauplii of Temora longicornis

Compartments of the pelagic system and material exchange at the Abrolhos Bank coral reefs, Brazil
and inner shelf realms of the pelagic system. The inshore realm was mesotrophic with typical estuarine phytoplankton and the others, fed by the Brazil Current, were oligotrophic with oceanic phyto- and zooplankton. Foreshore shoals, governed by terrigenous resuspended material, were the main source of matter to the coastal realm. The seaward transport of material was hampered by a hydrodynamic barrier set-up by strong shore-parallel currents and the inner arc of the reefs. Land impact upon the reef waters was mitigated due to efficient flushing by the Brazil Current.

**General information**

State: Published
Organisations: Universidade Federal Fluminense, Federal University of Parana, Leibniz-Institute for Baltic Sea Research, Alfred Wegener Institute for Polar and Marine Research, GEOMAR - Helmholtz Centre for Ocean Research Kiel
Authors: Knoppers, B. (Ekstern), Meyerhoefer, M. (Ekstern), Marone, E. (Ekstern), Dutz, J. (Intern), Lopes, R. (Ekstern), Leipe, T. (Ekstern), de Camargo, R. (Ekstern)
Pages: 285-306
Publication date: 1999
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Archive of Fishery and Marine Research
Volume: 47
Issue number: 2-3
ISSN (Print): 0944-1921
Ratings:
BFI (2008): BFI-level 1
Scopus rating (2006): SJR 0.289 SNIP 0.495
Scopus rating (2005): SJR 0.389 SNIP 0.933
Scopus rating (2004): SJR 0.302 SNIP 0.84
Scopus rating (2003): SJR 0.417 SNIP 0.797
Scopus rating (2002): SJR 0.546 SNIP 0.412
Scopus rating (2001): SJR 0.492 SNIP 0.538
Scopus rating (2000): SJR 0.361 SNIP 0.449
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.473 SNIP 0.895
Original language: English
Source: orbit
Source-ID: 282569
Publication: Research - peer-review › Journal article – Annual report year: 1999

**Repression of fecundity in the neritic copepod Acartia clausi exposed to the toxic dinoflagellate Alexandrium lusitanicum: Relationship between feeding and egg production**

The effect of the saxitoxin-producing dinoflagellate Alexandrium lusitanicum on the reproductive success of the calanoid copepod Acartia clausi was examined in the laboratory. Experiments were carried out to investigate the functional response of feeding and fecundity of copepod females at increasing concentrations (200 to 1600 mug C l-1) of either the toxic A. lusitanicum or the non-toxic Rhodomonas baltica as food sources. Additional experiments were performed to determine if prolonged exposure to A. lusitanicum affects copepod survival and fecundity. Results demonstrate that A. clausi fed on toxic cells at high rates without lethal effects and was able to produce eggs. Survival of females was similar with both diets. Depending on the food source, different functional responses were found. Feeding and fecundity of A. clausi on a diet of R. baltica followed simultaneously a typical satiation response. Fecundity was high and attained maximal rates of 32 to 36 eggs female-1 d-1. In contrast, functional responses of ingestion and fecundity by A. clausi fed on A. lusitanicum were not closely associated. Whereas feeding rates increased linearly with increasing food concentrations, egg production was limited and stayed constant at 16 to 20 eggs female-1 d-1 over the range of food concentrations offered. The comparison of calculated gross growth efficiencies for females feeding on both algae indicated an inefficient utilization of ingested toxic food. High feeding rates on toxic A. lusitanicum suggest that saxitoxins do not act as allelopathic chemicals against grazing in A. clausi. Nevertheless, fecundity was adversely affected. It is suggested that ingested toxins probably interfere with digestive processes or cause an enhanced energy expenditure due to detoxification because copepods could cope with toxic algae. As a result, less energy is available and this might explain the reduced fecundity in females.

**General information**

State: Published
Organisations: Alfred Wegener Institute for Polar and Marine Research
Authors: Dutz, J. (Intern)
Pages: 97-107
Publication date: 1998
The impact of the toxic dinoflagellate Alexandrium lusitanicum on feeding behavior and egg production of the calanoid copepod Acartia clausi
Ingestion and faecal pellet production of three zooplankton size fractions in coastal waters of the Abrolhos Bank (Brazil)

**General information**
State: Published
Organisations: Unknown
Authors: Dutz, J. (Intern), Lopez, R. (Ekstern), Bathmann, U. (Ekstern)
Publication date: 1996
Event: Poster session presented at International Conference on Copepoda, Oldenburg, Germany.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 282572
Publication: Research › Poster – Annual report year: 1996

Projects:

Baltic zooplankton; eco-physiology and adaptation

National Institute of Aquatic Resources
Period: 01/06/2014 → 30/08/2017
Number of participants: 6
Phd Student:
Christensen, Anette Maria (Intern)
Supervisor:
Dutz, Jörg (Intern)
Main Supervisor:
Koski, Marja (Intern)
Examiner:
Jonasdottir, Sigrun (Intern)
Guerrero, Han G. Dam (Ekstern)
Tiselius, Peter (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Biodiversity changes - causes, consequences and management implications (BIO-C3) (39117)
BIO-C3 will investigate the dynamics of biodiversity in the Baltic Sea, their causes and the consequences for the function of food webs, including implications for biodiversity management policies.

Baltic biodiversity is historically dynamic responding to various drivers operating at different time and space scales. Species diversity is generally low and contains many recent immigrants and glacial relict species because of low salinity and relatively young age. Nevertheless, Baltic food webs sustain many goods and services valued by society.

We focus on functional consequences of ongoing and projected distributional and compositional changes of benthic and pelagic communities with a focus on invasive and resident key species. Using spatial and temporal projections of abiotic/biotic drivers including their interaction (climate change, eutrophication, species invasions, fisheries), we will assess how biodiversity (e.g., of species, traits, habitats) responds in time, space and along gradients of human impact and hydrography. We will investigate the potential and genetic basis for colonisation, acclimation and adaptation of species and populations to the Baltic Sea, and how compositional and adaptive changes of Baltic biodiversity affect ecosystem functions with an emphasis on trophic linkage and food web dynamics.
Results will feed into impact assessments that guide management policies including improved operationalization of status indicators, and guidelines for MPAs.

The project is coordinated by Helmholtz Centre for Ocean Research, Kiel (GEOMAR). DTU Aqua is co-coordinator.

The project is funded equally by EU, BONUS (Science for a Better Future of the Baltic Sea Region), ERA-NET.

National Institute of Aquatic Resources
Section for Marine Ecology and Oceanography
GEOMAR - Helmholtz Centre for Ocean Research Kiel
University of Hamburg
Stockholm University
National Marine Fisheries Research Institute
University of Tartu
Finnish Environment Institute
Klaipeda University
DHI Denmark
University of Gothenburg
Johann Heinrich von Thünen-Institute
Swedish Meteorological and Hydrological Institute
Åbo Academy University
Period: 01/03/2014 → 28/02/2018
Number of participants: 10
Research areas: Marine Populations and Ecosystem Dynamics & Fish Biology & Population Gentic & Ecosystem based Marine Management
Project participant:
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MacKenzie, Brian (Intern)
Eero, Margit (Intern)
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Dutz, Jörg (Intern)
Behrens, Jane (Intern)
Huwer, Bastian (Intern)
Project Manager, organisational:
Neuenfeldt, Stefan (Intern)
Project Manager, academic:
Jaspers, Cornelia (Intern)
Project Coordinator:
Köster, Fritz (Intern)
Project

Investigation of causes for declines in fish abundance in coastal areas (KYSTFISK-I) (39031)
Danish fishermen complained of drastic declines in coastal fish populations, negatively impacting their fisheries opportunities but the nature and magnitude of the problem was uncertain.

This project aimed to collate information from fishers to map the problem, including which species and geographical areas involved. In total 74 fishers were interviewed and the problem mapped in Stettrup et al. (2014a). The project further aimed to explore existing survey data that could support the observed changes in fish distribution (Stettrup et al. 2014b) and conduct a literature review to explore if similar trends had occurred in neighboring countries and potential causes for the developments had been identified (Dutz et al. in revision).

The project is coordinated by DTU Aqua.

The project was funded by the Danish Ministry of Food, Agriculture and Fisheries and the European Fisheries Fund (EFF).
Response of pelagic food webs to warmer, acidified oceans (Pelagic foods) (38923)
Atmospheric CO2 is projected to double by 2100, resulting in increased global temperature, ocean acidification (OA) and changes in the balance of marine ecosystems. A general lack of multifactorial studies means very limited knowledge on the combined effects of these pressures on ecosystem structure and function. Preliminary mono-factorial data indicate important but little studied appendicularians (pan-global pelagic urochordates) may be strongly impacted, directly and indirectly via altered phytoplankton growth and chemical composition. Effects on other key plankton such as copepods may depend on phytoplankton size. Appendicularians repetitively secrete and discard filter-feeding houses. Discarded houses with trapped particles make a significant contribution to global vertical carbon flux. We will study combined effects of temperature and CO2 on these dominant zooplankton by manipulating natural plankton in mesocosms. We hypothesize climate change will impact the important zooplanktonic trophic level through top down altered predation fields and bottom up changes in prey type and size. Copepods are size-selective feeders and recent data suggest appendicularians are bottom up regulated by large and spiny particles. We will test these hypotheses in mesocosms by generating blooms of diatoms (large) or flagellates (small) and evaluate subsequent zooplankton population dynamics. Under these different conditions, we will also examine competitive predatory interactions between copepods and appendicularians, leading to models of projected effects of p(CO2) and temperature on appendicularians and copepods through alterations in phytoplankton community structure and uni-directional predatory pressure. Both appendicularians and copepods are important in oceanic carbon sequestration, but do so via different pathways. Data from these experiments should also have important predictive value on the nature and extent of future carbon sequestration in marine pelagic communities.

The project is coordinated by University of Bergen, Norway.

Arctic plankton in a changing climate (38783)
Climate change impacts the marine arctic environment through changes in ice cover, ice thickness, irradiance, freshwater outflow, concentrations of nutrients and CO2 and the stratification. These factors determine the production, seasonality
and fate of the planktonic primary production in the marine ecosystem. Plankton is fueling stocks of fish, marine birds and mammals and through that constitutes the base of the Greenlandic economy.

The aim of the project was to gain knowledge about the interaction between climate, oceanography and plankton in the vulnerable Greenlandic marine ecosystem through field and laboratory experiments. The project was interdisciplinary and closely coordinated with the other projects under the Greenland Climate Research Centre.

The project was funded by the Commission for Scientific Investigations in Greenland (KVUG), Greenland Climate Research Centre, Danish Centre for Marine Research, and Carlsberg Foundation.

The project was coordinated by DTU Aqua.

National Institute of Aquatic Resources
Section for Marine Ecology and Oceanography
Aarhus University
Greenland Institute of Natural Resources

Period: 01/01/2010 → 31/12/2014
Number of participants: 7
Research areas: Oceanography & Marine Populations and Ecosystem Dynamics
Project participant:
Jonasdottir, Sigrun (Intern)
Koski, Marja (Intern)
Dutz, Jörg (Intern)
Kjellerup, Sanne (Intern)
Swalethorp, Rasmus (Intern)
Munk, Peter (Intern)

Project Manager, academic:
Nielsen, Torkel Gissel (Intern)

Fehmarn Belt science provision project: Fehmarn Belt fish and fisheries and related environmental investigations (38669)

Objectives and Background
The purpose of the project was to investigate main exploited fish stock and fisheries dynamics in relation to the marine environment with focus on the Fehmarn Belt area in the Western Baltic Sea, and to provide science and research based investigations and results, as well as reports and scientific peer reviewed journal papers on this. The work was associated to the scientific baseline investigations (2009-13) and impact assessment of the projection of the Fehmarn Belt Fixed Link between Denmark and Germany involving a science cooperation between DTU Aqua, Thünen-Institute and Femern Bælt A/S in order to generate knowledge on potential impacts of establishment of the fixed link. Focus was on the most important commercial fisheries and fish stocks in the area (cod, herring, and sprat, but also flatfish and eels).

Tasks and Deliverables
The work covered WP0: Prospecting, planning and development of the investigations, producing outline and main contents of the science provision contract and coordination of tasks hereunder with DTU Aqua as inter-national project coordinator; WP1: Review of known-ledge: Review, provision of data, and analyses of selected historical data on fish stock and fisheries dynamics; WP2: Extension of existing, standard research surveys and linking to standard survey time series to detect potential effects on important fish stocks; WP3: Evaluation of potential integrated effects on important fish stocks and fisheries; WP4: Evaluation of potential effects of change and variability in hydrographic features and conditions on recruitment for important fish stocks (cod, herring, sprat); WP5: Evaluation of herring occurrences and migrations as well as separation of spring and autumn spawning herring stock components in the area.

WP1 included provision of state of the art knowledge from historical surveys and review of quality of survey indices, commercial fisheries data, and information on recruitment dynamics with emphasis on fluctuations in distribution and productivity with respect to environmental and anthropogenic drivers of change including species interactions and fisheries.

WP 2 included extension of existing standard surveys in the near field area and analyses of both the standard and extended time series with respect to variability in distribution, density and abundance patterns of relevant stocks, as well as developing advanced scientific survey evaluation models and methods for this.

WP 3 analyzed stock and fisheries dynamics by use and development of complex multi-fleet-multi-stock bio-economic management evaluation models performing analyses on a very high spatial and temporal resolution scale using integrated fisheries, stock and survey data. The models evaluated different management options and scenarios relevant for the establishment of the fixed link.

WP 4 evaluated variability in recruitment and important spawning areas according to hydrographic features and in relation to impact of the fixed link among other by use and further development of complex hydro-dynamic models.
WP Sevaluated herring stock occurrence and migration patterns in the Baltic areas by use of genetic identity markers, otolith micro-structures and information from fisheries and research surveys in order to evaluate impact of the fixed link. The project has besides a long row of project reports produced around 30 scientific peer reviewed journal papers where DTU Aqua are first author on more than half and co-author on more than 20 of the papers. The project was coordinated by DTU Aqua. The project was funded by the 3 partners with external funding from Femern Bælt A/S.

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Johann Heinrich von Thünen-Institute
Femern A/S
Period: 01/01/2009 → 31/12/2013
Number of participants: 15
Research areas: Fisheries Management & Fish Biology & Marine Living Resources & Population Genetics
Project participant:
Worsøe Clausen, Lotte (Intern)
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Bekkevold, Dorte (Intern)
Huwer, Bastian (Intern)
Hüssy, Karin (Intern)
Storr-Paulsen, Marie (Intern)
Stæhr, Karl-Johan (Intern)
Sparrevohn, Claus Reedtz (Intern)
Jepsen, Niels (Intern)
Lewy, Peter (Intern)
Kristensen, Kasper (Intern)
Dutz, Jörg (Intern)
Christensen, Asbjørn (Intern)
Geitner, Kerstin (Intern)
Project Coordinator:
Nielsen, J. Rasmus (Intern)

The biological pump in the Nordic seas: Copepods and appendicularians as producers and consumers of sinking particles (BIOPUMP) (38757)
BIOPUMP is a research network investigating the vertical flux, its production and consumption, and how it is affected by the climate change. The main activities of the network are annual research workshops concentrating on diverse aspects of vertical flux, such as the role of different zooplankton groups in producing and degrading of sinking particles, and how will the changing temperature and CO2 concentrations of the ocean influence the dynamics of these groups. BIOPUMP is also involved in organizing a Nordic PhD course on vertical flux and factors influencing it. The project is coordinated by DTU Aqua.

National Institute of Aquatic Resources
Centre for Ocean Life
University of Tromsø
University of Bergen
University of Oslo
University of Gothenburg
Stockholm University
Greenland Institute of Natural Resources
National Environmental Research Institute
Fatty acids in the marine food chain (38160)
Primary production by autotrophic phytoplankton fuels the marine ecosystem and this energy is passed through the food web by trophic interactions. Understanding how energy flows through these interactions is vital for understanding how marine ecosystems function. The efficiency of energy transfer from primary producers to higher trophic levels depends on the efficiency of secondary producers utilizing the new carbon. This crucial link is still poorly understood and most often we observe that secondary production is not simply correlated with phytoplankton biomass. However, reproduction and growth of secondary producers, such as copepods, depend also on food quality. The goal of this project is to investigate the effect of essential fatty acids on copepod reproduction, growth and survival. Essential fatty acid are the ones the copepod need but has to attain from the food, as it cannot synthesize those de-novo. The project is based on series of laboratory, field and mesocosm studies with the focus on understanding on how food composition, both chemical composition and type affect growth and mortality all contribution to population dynamics of the copepod species. In addition the project has a strong teaching factor for masters and PhD students in form of advanced summer schools.

The project is coordinated by DTU Aqua.

National Institute of Aquatic Resources
Centre for Ocean Life
Aarhus University
Uni Research AS
Period: 01/01/2004 → 31/12/2013
Number of participants: 3
Research area: Oceanography
Project participant:
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Project Manager, academic:
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Project