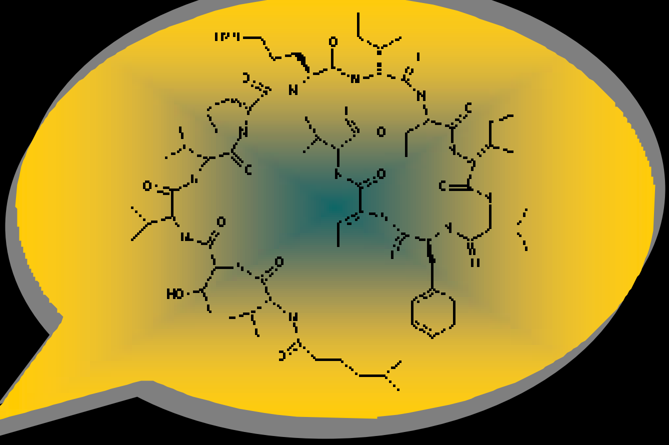


ROSEMEB

Role of Secondary Metaboltes in Ecosystem Biodiversit

Adrianna Ianora and Raffaella Casotti

AIM: Integrate Activities on Chemical Ecology within the MarBEF NOE

Training Courses, Workshops, Sabbaticals

Other Activities (writing of position papers, exchange of information, data and samples)

List of Participants

- Stazione Zoologica of Naples, Italy
- Roscoff Marine Laboratory, France
- Institute of Bio-Molecular Chemistry, Pozzuoli (Naples)
- Helgoland Marine Station (AWI), Germany
- Tjärnö Marine Laboratory, Sweden
- Centro Interdisciplinar de Investigação Marinha Ambiental(CIMAR)/
  Instituto Nacional de Engenharia, Tecnologia e Inovação (INETI), Portugal
- Max-Planck-Institute for Marine Microbiology, Germany
- Villefranche Marine Station, France

ROSEMEB Activities for 2005-2006

-Kick-off meeting in Ischia, Italy, 3- 4 November 2005
-Position paper “New Trends in Marine Chemical Ecology” by Ianora and 8 co-authors under revision for “Estuaries”
-List of relevant publications posted on MarBEF-ROSEMEB webpage
-Training course on “Bioassay Methods in Chemical Ecology” 9-14 September 2006 in Tjärnö, Sweden
-Exchange of samples
-Short sabbaticals

marbef

ROSEMEB

Role of Secondary Metabolites

In driving ecosystem functionality and maintaining ecosystem biodiversity

New reference list of relevant publications in chemical ecology

This is a list of published scientific papers, relevant to the general field of marine chemical ecology, meaning by this all fields of research dealing with secondary metabolites of marine organisms and their effects at the molecular, cellular, population, community, and ecosystem level. This list has several aims, from providing general reading to interested scientists, to offering a starting point for potential researchers in chemical ecology, to presenting supporting evidences from different models on the role of secondary metabolites in marine systems. It reflects the expertise of the participants in the MarBEF-ROSEMEB subproject, and is not intended to be exhaustive or final and will be updated as necessary.

Stazione Zoologica Anton Dohrn

marbef

MARBEF Advanced Course on

Chemical ecology and bioassay methods

Marine Biological Laboratory
Tjärnö, Sweden, 9-14 September 2006

Course Coordinators

Adrianna Ianora
Henrik Pavia

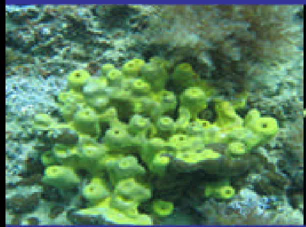
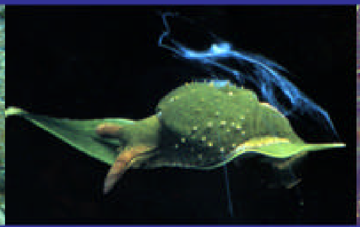
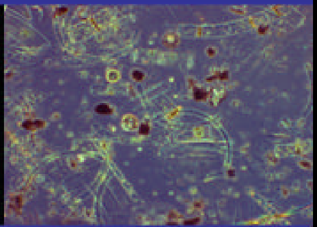
Scientific Board

Jens Harder
Raffaella Casotti
Adrianna Ianora
Gunilla Toth
Angelo Fontana

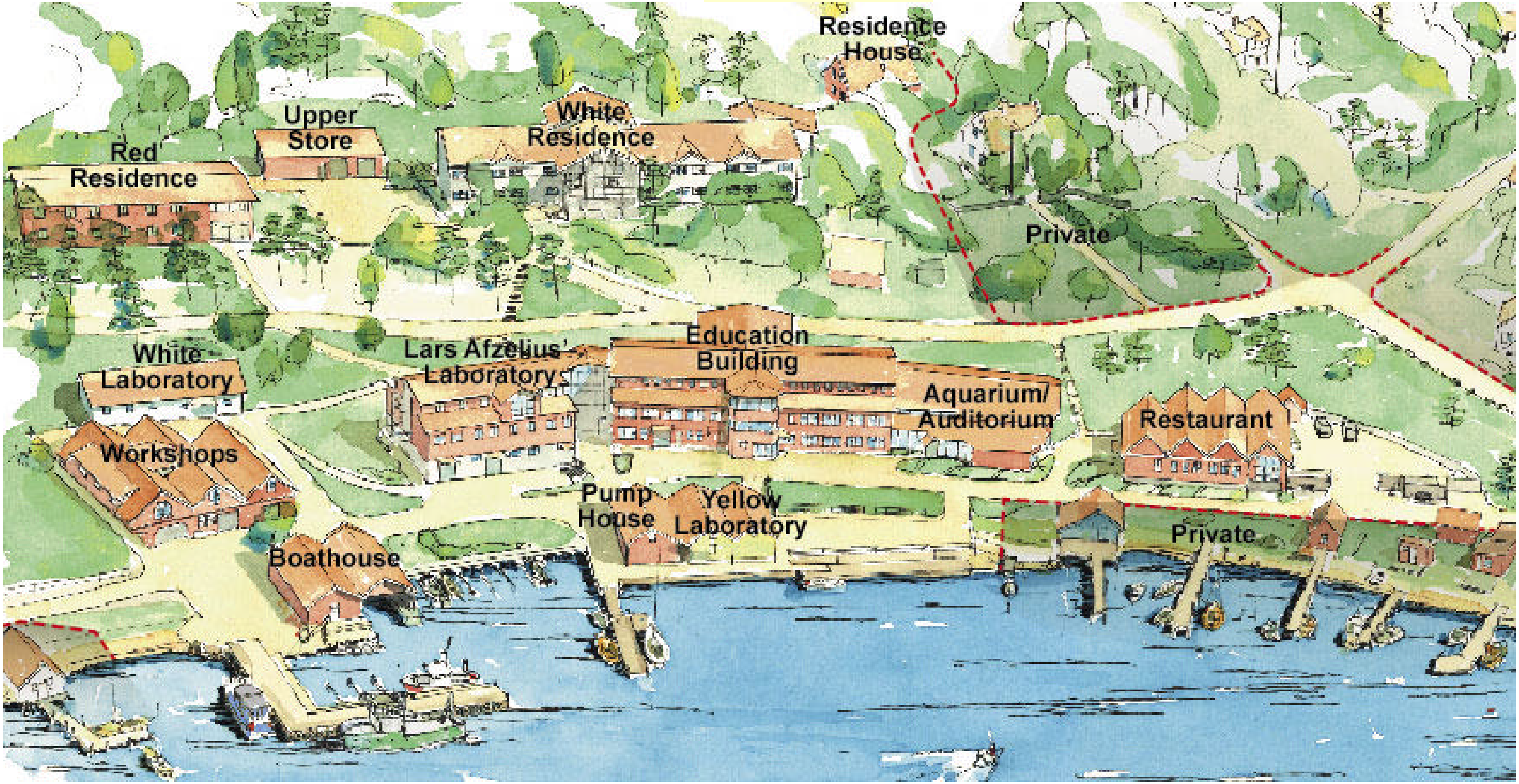
Faculty

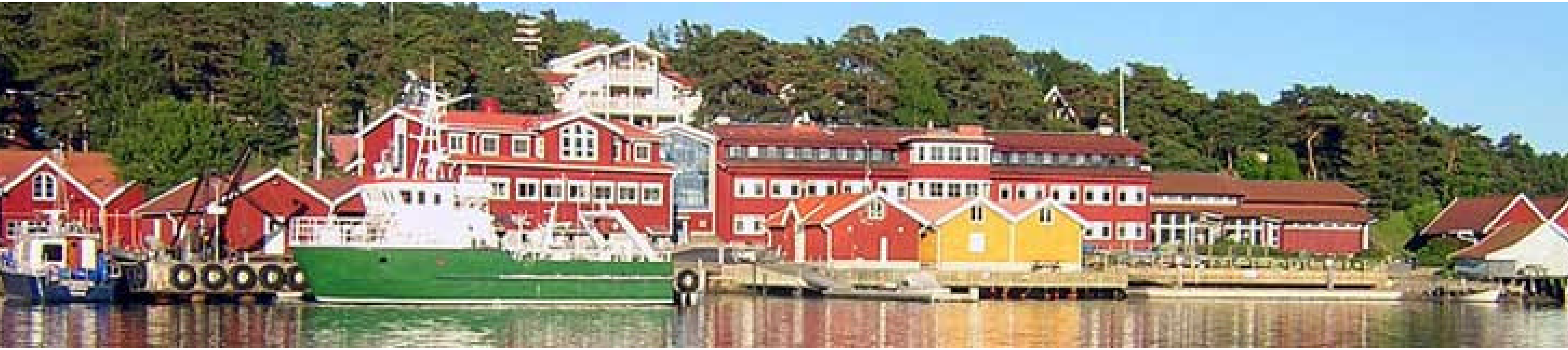
Maarten Boersma (D)
Raffaella Casotti (I)
Angelo Fontana (I)
Jens Harder (D)
Mark E. Hay (USA)
Friederike Hoffmann (D)
Adrianna Ianora (I)
Catherine Legrand (SE)
Henrik Pavia (SE)
Joe R. Pawlik (USA)
Philippe Potin (F)
Serge Poulet (F)
Giovanna Romano (I)
Michael Steinke (UK)
Gunilla Toth (SE)

TOPICS: Chemical Ecology, Marine Natural Products, Ecotoxicology, Allelochemicals, Bioassays of natural compounds, Chemical defense, Deterrency, Trophic Interactions, Methods

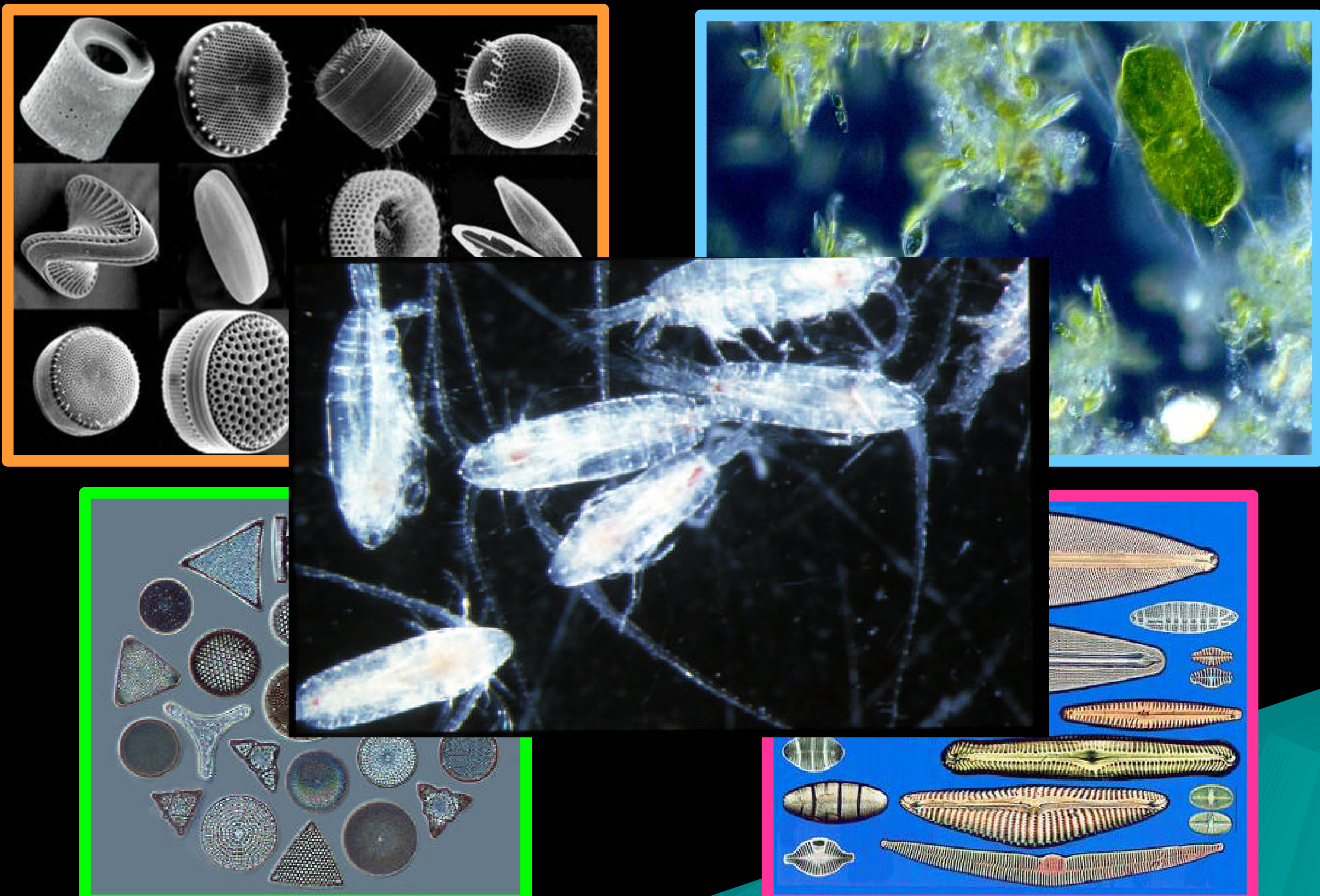




More info and application forms: www.marbef.org
Contact person: gunilla.toth@tmbl.gu.se
Deadline for application: June30th, 2006

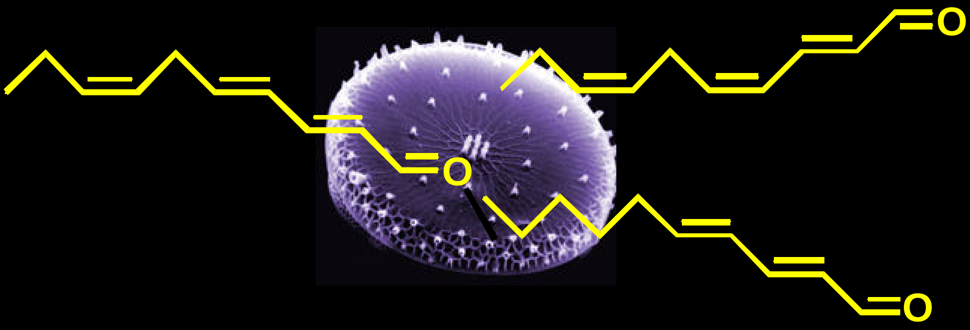

Residence House
Upper Store
White Residence
Red Residence
Private
Education Building
White Laboratory
Lars Afzelius' Laboratory
Aquarium/ Auditorium
Restaurant
Workshops
Pump House
Yellow Laboratory
Private
Boathouse



Diatom-Copepod Interactions



Cytotoxic PUAs are produced by *specific* diatoms

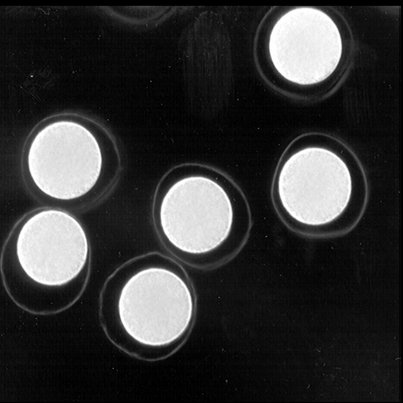


Aldehydes from *T. rotula, and S. costatum* have been shown to inhibit cell division in copepods and other invertebrates.

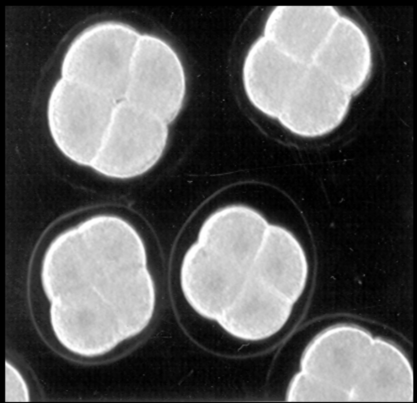
Miralto *et al.* Nature 1999
Ianora *et al*. Nature 2004

Presence of PUAs in diatoms does not reduce the feeding activity of herbivorous copepods.

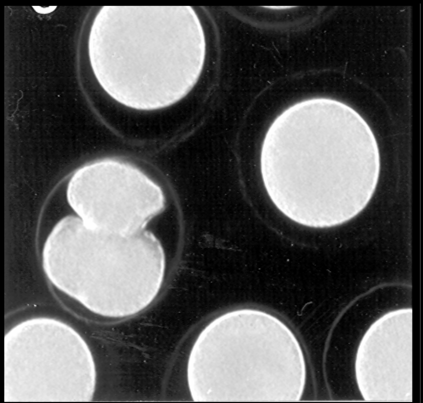
Bioassays with sea urchin eggs



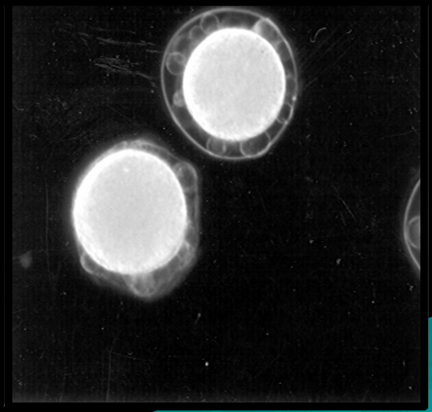
Control t = 10 min



Control t = 4h



After addition of decadienal (1mg / l)



Toxic effects

Adolph *et al*., 2004; Poulet 2005

Aldehyde suppression of copepod larval growth

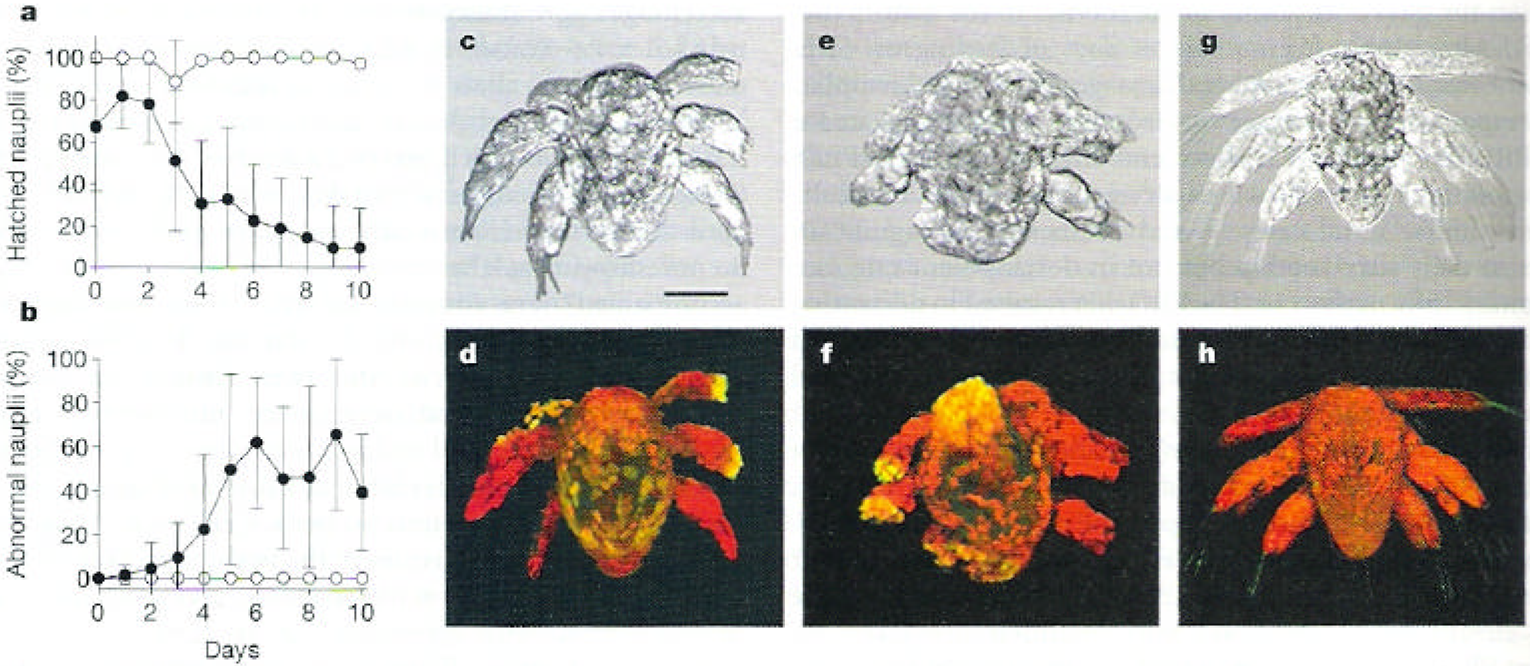
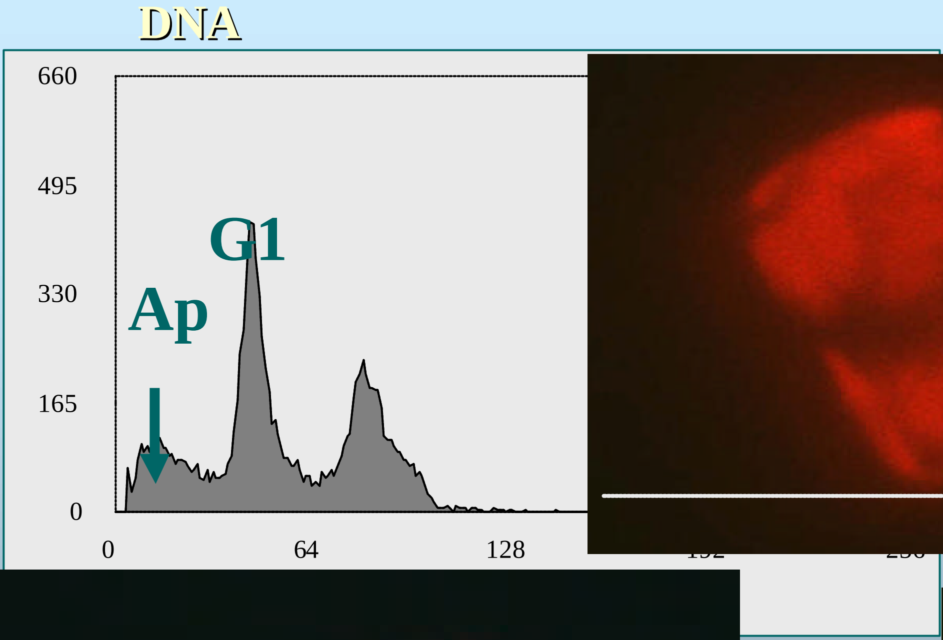
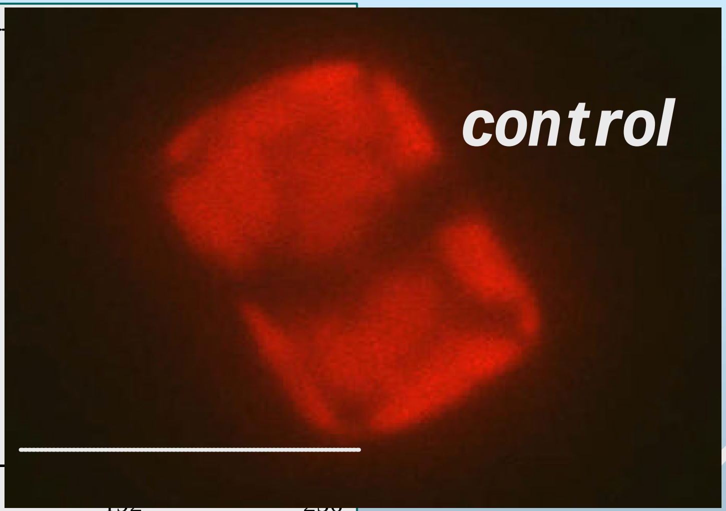


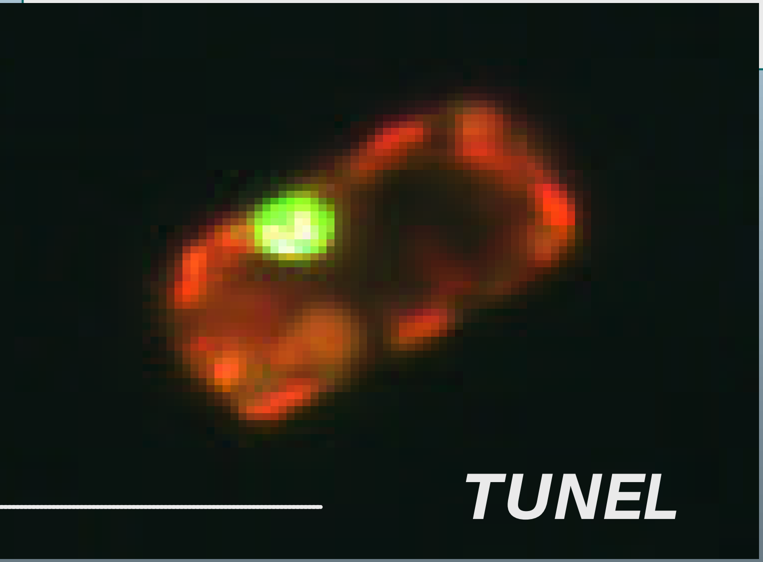
Figure 3 Effects of diet on *C. helgolandicus* offspring fitness. **a**, After ten days of feeding, the viability of eggs spawned by *C. helgolandicus* females fed the diatom *S. costatum* SKE (filled circles) dropped to <20% compared with >95% with the control dinoflagellate *P. minimum* PRO (open circles). **b**, After five days of feeding on SKE, 45–65% of the hatched nauplii were abnormal. **c**, **d**, Such nauplii had deformed limbs that were positive for TUNEL staining (yellow, **d**) specific for apoptosis. **e**, **f**, After nine days of feeding on SKE, the degree of teratogenesis increased and nauplii were strongly deformed. **g**, **h**, Nauplii generated from females fed the control PRO diet appeared normal and stained negatively with TUNEL (**h**), indicating that nuclei were not apoptotic. Scale bar, 90 μm.

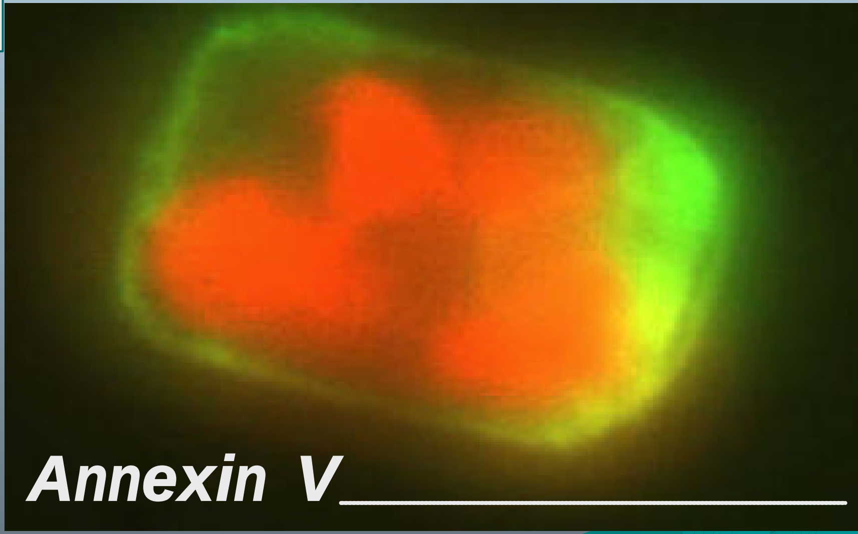
Ianora et al. Nature 2004

Effects of unsaturated aldehydes on diatoms

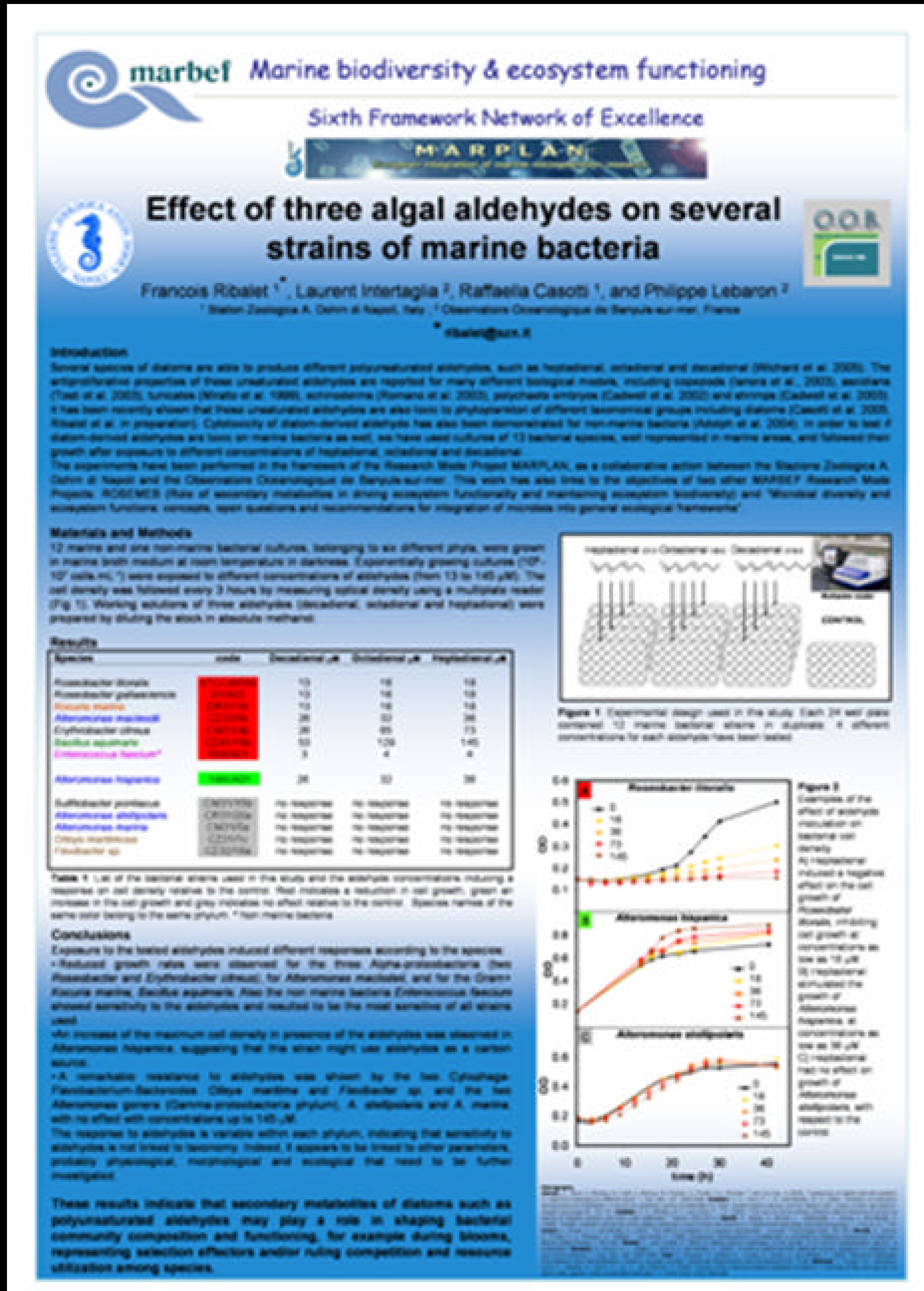






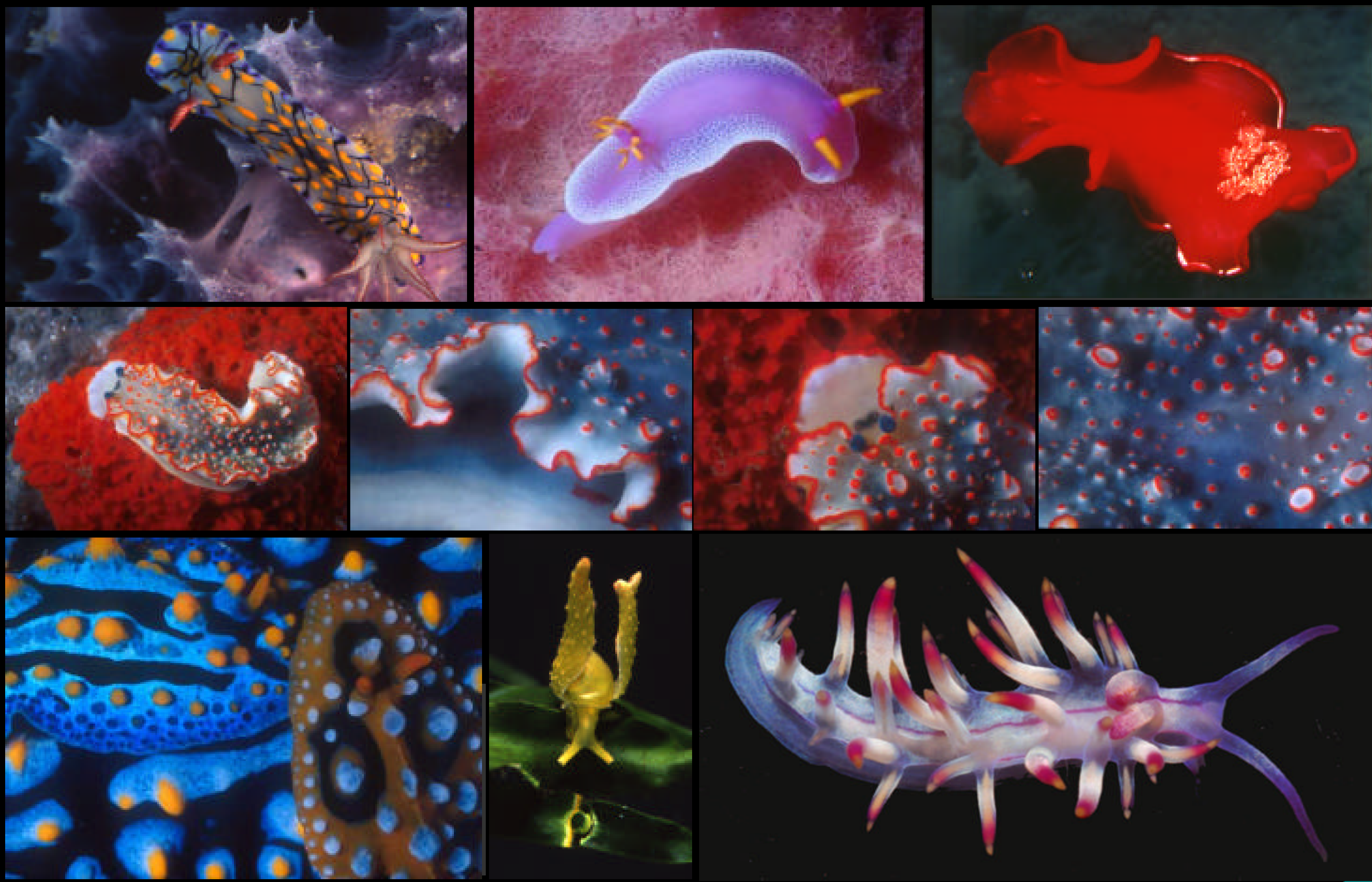


Casotti et al. 2005



Ribalet et al. 2006

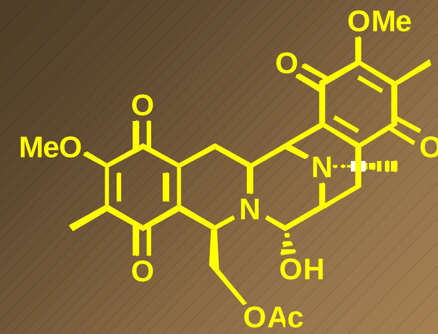
Repulsive for potential predators



Attractive for marine chemists

Mollo et al. 2005

Zalypsis®

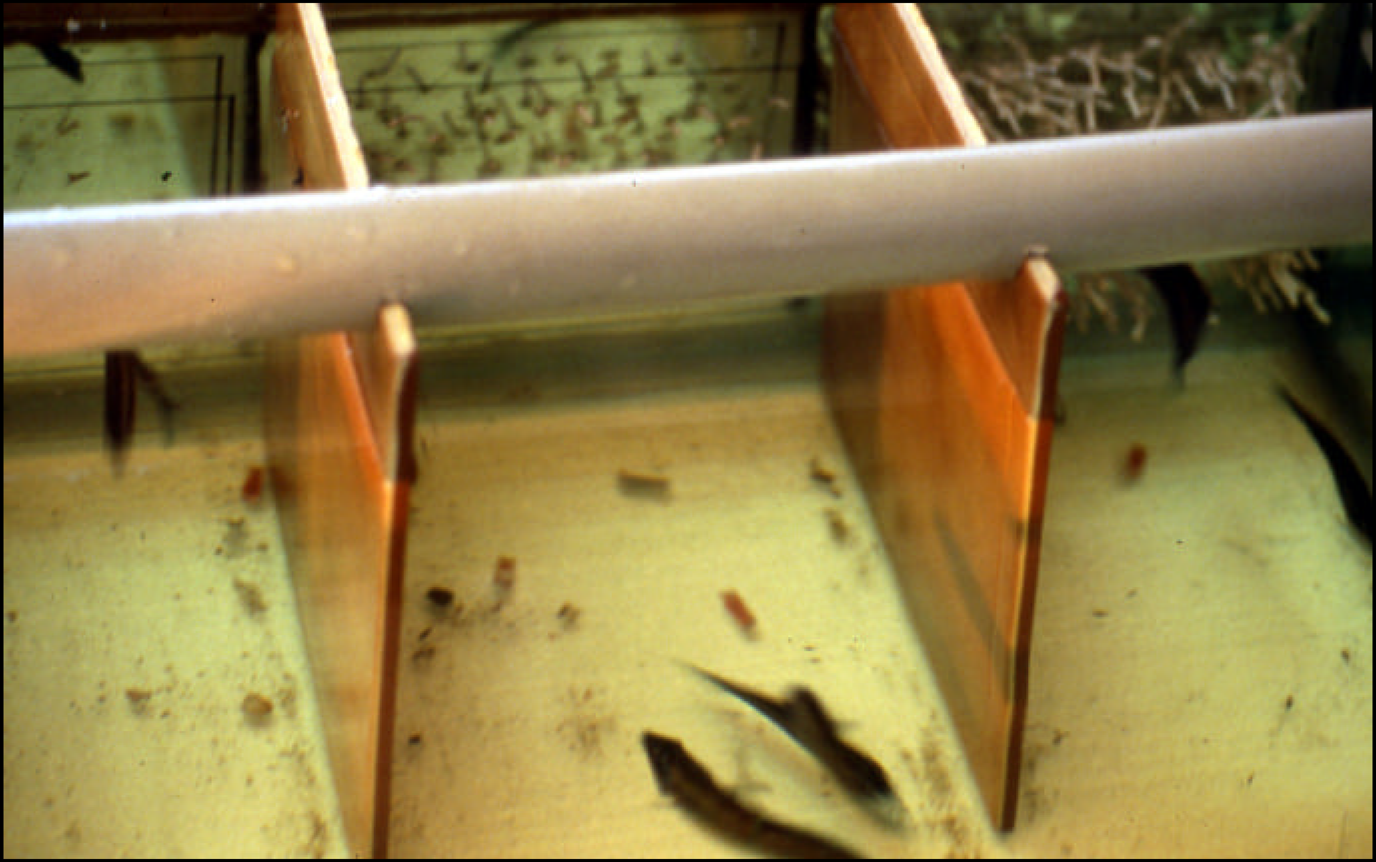


jorumycin

- Zalypsis® (PM00104/50) is PharmaMar's fi marine derived compound that has begun Phas nical trials for the treatment of solid tumours.
- Zalypsis® is a novel chemical entity related to the marine natural compounds Jorumycin and the family of Renieramycins, obtained from molluscs and sponges, respectively.

Fontana et al. 2005

Ecological activity: feeding deterrency of marine opisthobranchs



Fontana et al. 2005

Summary:

to compare the biological activity of secondary metabolites and distinguish those that act as allelochemicals and growth inhibitors, or induce antifouling, feeding deterrency, toxicity and death

to differentiate between the effects induced due to nutritional deficiency and from those induced by toxins and growth inhibitors

to study the biochemical pathways and the biochemical control that underlie synthesis of secondary metabolites

to exchange samples for chemical and biological screening among network members

to intercalibrate methods