

## **9th International Conference and Workshop on Lobster Biology and Management, a conference summary**

The lobster conference is over for now, and it is wrap-up time. For me as convener, I have a good feeling that this conference went down pretty well. This according to the feed-back I've had and also from the buzz in the corridors and the good spirit in the presentation halls I had time to visit during the conference, and especially during the midweek cruise and the banquet. The meet-and-greet at the Institute of Marine Research cantina Sunday night June 19<sup>th</sup> gathered a good group of enthusiastic and expectant participants, greeted by the Director General of Fisheries in Norway, Liv Holmefjord. All in all, 135 participants were present, from 21 different countries and all the inhabitant continents of the world.

The conference was officially opened by the Managing Director of IMR, Tore Nepstad on Monday June 20<sup>th</sup> and closed Friday June 24<sup>th</sup>, with summaries of the workshops and special seminar leaders and closing remarks by leader of the IMR Aquaculture Research Programme, Karin Kroon Boxaspen and the convener.

Between these events, it was a week filled with 'new, cool, and interesting' talks and posters on lobsters of all kinds. Three themes were selected for special focus, Aquaculture, Disease and Sensory Biology from the neurologic base to behavioral patterns. See summaries below from guest collaborators.

The chosen best student presentation of the conference went to Mahima Jaini, and the best poster presentation went to Hilke Alberts-Hubach. Thanks to donation by the crustacean Society Elena Mente could present a one year student membership along with a money gift to the best overall student presentation.

Three talented students were awarded the newly established 'Paul Kanciruk Student Travel Award': Nancy Herrera Salvatierra, Andrew Kough and Dan Hines. Great thanks to prof. William Herrnkind, who made the donation from the late Paul Kanciruk legation to this wonderful student support, and to Mark Butler, Alison MacDiarmid and Raquel Goñi for their task to select the lucky awardees. Hopefully the travel award will grow to be a permanent and attractive way to get students to keep participating in future lobster conferences.

In between the oral presentations and a disease workshop, the poster session took place, as usually with refreshments being served. The midweek break was arranged as a fjord cruise, thanks to the generosity of the directorship of the IMR. We do hope all 130 participating passengers enjoyed the fjords south of Bergen and the refreshments served on board the magnificent tall ship, a three-masted barque, Statsraad Lehmkuhl of Bergen, Norway.

For the banquet, the venue hotel had prepared an excellent halibut dinner, jazz singer-songwriter Oded ben-Horin had composed a special lobster song 'Deep Down Lobster', which he included in a jazz concert, along with other of 'The Science Fair' compositions and performed by himself along with Thomas Dahl and Stein Inge Brækhus. With further entertainment like Jelle Atema's talk 'On the evolution of civilisations of humans and lobsters', using fossilized bones, bones and lobster claws for flutes, and a swinging Per Pahr

Band playing dance music, no complaints have been reported to the convener, except from hotel guests not included in the conference.

At the moment, publication preparations are in progress and we still have a hope that the five conference editors, who generously have taken upon them the important task, will receive enough good manuscripts to allow us to have five special-issues of the excellent journals: Aquaculture (a.jeffs@auckland.ac.nz), Diseases of Aquatic Organisms (behringer@ufl.edu), Frontiers in Aquatic Physiology (steffen.harzsch@uni-greifswald.de), Fisheries Research, and Marine biology Research ([friedrich.buchholz@awi.de](mailto:friedrich.buchholz@awi.de) and [Adrian.linnane@sa.gov.au](mailto:Adrian.linnane@sa.gov.au)). For MBR, the list of MS is delivered the journal editor, and absolutely dead-line is in August 2011 for the rest of the journals.

The convener and her colleagues and staff at the IMR will extend our thanks to all our guests, making our preparations so worthwhile, and being so patient with the misses and flaws we certainly did on our way to get the 9<sup>th</sup> ICWL going, making it a conference we will remember with pride and happiness forever. Please stay tuned with the conference web-site ([http://www.imr.no/icwl\\_bergen](http://www.imr.no/icwl_bergen)), as it will continue to release information from the conference in the next months and years, at least until the 10<sup>th</sup> ICWL conference in Mexico.

#### **General ecology, biology and physiology** (selection by Friedrich Buchholz)

At the Bergen ICWL the scope of the presentations were wide and the following topics by prominent international authors in lobster research shows this.

Spiny lobsters were as usual well covered, by topics different as larvae riding on jellyfish, using them as weapon and food source, through a record of mechanisms of mate choice and then timing of recruitment pulses - feeding into management issues, on seasonal aggregation including a model for management, and finally studies of interfacing research and support of governmental stock management.

Early benthic phase lobster are evasive, but a first record in a slipper lobster was presented, as well as new methods and outcome of an encompassing study of benthic recruitment of a clawed lobster, followed by a behavioural study on trap efficiency. Additional, the intrinsic structure of the lobster's cuticle as an interface to environment on the American lobster was demonstrated.

One study on the European counterpart of the American lobster reports temperature effects on moulting and motility with a view to climatic change and management issues, one study focused on the mud dwelling Norway lobster where moult staging is proposed as a pre-requisite for ecological reasoning. Evolutionary traits in terms of predator defence mechanisms was compared between the slipper lobster and horseshoe crabs.

**Aquaculture** (summarized by Jason Goldstein, coordinator. Ann-Lisbeth Agnalt was assistant coordinator.)

Larval Culturing, Diet & Nutrition, Culturing Operations. Disease was included in the disease session.

### *Larval Culturing and juvenile seeding for stock enhancement*

#### What was new, cool, and interesting:

- *P. ornatus* success and scale-up production
- *P. h. homarus* culture using advanced rearing techniques
- Use of ozone and chemical disinfectants to control bacterial communities in culture
- Use of probiotics in phyllosoma gut tracks
- Genetic tracking of broodstock in hatcheries
- Integrated juvenile growout using polyculture)
- Stage IV seeding projects need to be local and community-based
- Conditioning studies may modify behavior and ability to compete for shelter (Need to look much more at this)
- The incidence of disease to in sea cages 30-50% loss in production!

#### What do we want to see next?:

- Improved tank designs, Scale-up for production; Nutritionally optimal feeds; Commercial hatchery production; Other species to try?
- How to control disease?; Opportunities for land-based production systems; Use of pelleted feeds; Alternative species?; Impact of juvenile hatchery supply of juveniles; Improve sustainability of seed stocks; Develop effective growout systems; Improve sustainability in industry

### *Diet & Nutrition*

#### What was new, cool, and interesting:

- Feeding requirements for growout between fresh and pelleted feeds (biofouling on sea cages beneficial, increased digestibility from formulated feeds .
- Trash fish feeding in sea cages provide higher growth (compared with pellets), but increased organic wastes and very variable.
- Postlarval competency in clawed lobster (*H. americanus*) increased using a lipid-rich diet.)

#### What do we want to see next?

Further improvement in artificial feeds – sustainable protein sources, role of carbohydrates, improved performance. Vital link to improving environmental performance of lobster aquaculture.

### *Culturing Operations*

#### Reconciling Aquaculture and the Environment

#### Issues

Very little available information; Sustainability of harvesting post-larvae and juvenile tropical species is unclear; Impact of use of “trash fish”; Biosecurity and externalities

### Solutions

Hatchery production of juveniles; Development of cost-effective artificial feeds; Studies of environmental impact of farming activities

### *Suggestions for the next meeting*

Lessons from other related species – Crabs; How to organize sessions with more talks?; Perhaps integrating some aquaculture talks with other themes?; Creation of a panel discussion

**Diseases** (Don Behringer, along with Mark Butler and Kathy Castro)

**Neurobiology, sensory biology and behavior** (prepared by Steffen Hartsch and Thomas Breithaupt, led by Win Watson and Jelle Atema)