

## Content

- > **Jellyfish born at ILVO laboratories | 1**
- > **MEMO Workshop Genetica Molecular analysis techniques | 2**
- > **Can native predators control *Mnemiopsis leidyi* blooms? Partner 3: ULCO-LOG | 3**
- > **Interview of the month | 4**  
An introduction to Thomas Raud, Engineer at ULCO-LOG

## Colophon

**editorial:** Sabrine Derveaux, Lies Vansteenbrugge, Stefan Hoffman, Victor Langenberg, Lodewijk van Walraven, Dorothée Vincent, Thomas Raud, Johan Robbens, Greet Riebbels, Filip Matthijs, Miriam Levenson, Elvire Antajan, Jean-Michel Brylinski, Sophie Pitois, Jan Van Dalfsen  
**Lay-out:** Kliek Creatieve Communicatie, www.kliek.be  
**Research Leadership:** Johan Robbens

[www.ilvo.vlaanderen.be/memo](http://www.ilvo.vlaanderen.be/memo)

'The document reflects the author's views. The INTERREG IVA 2 Seas Programme Authorities are not liable for any use that may be made of the information contained therein.'

## Jellyfish born at ILVO laboratories

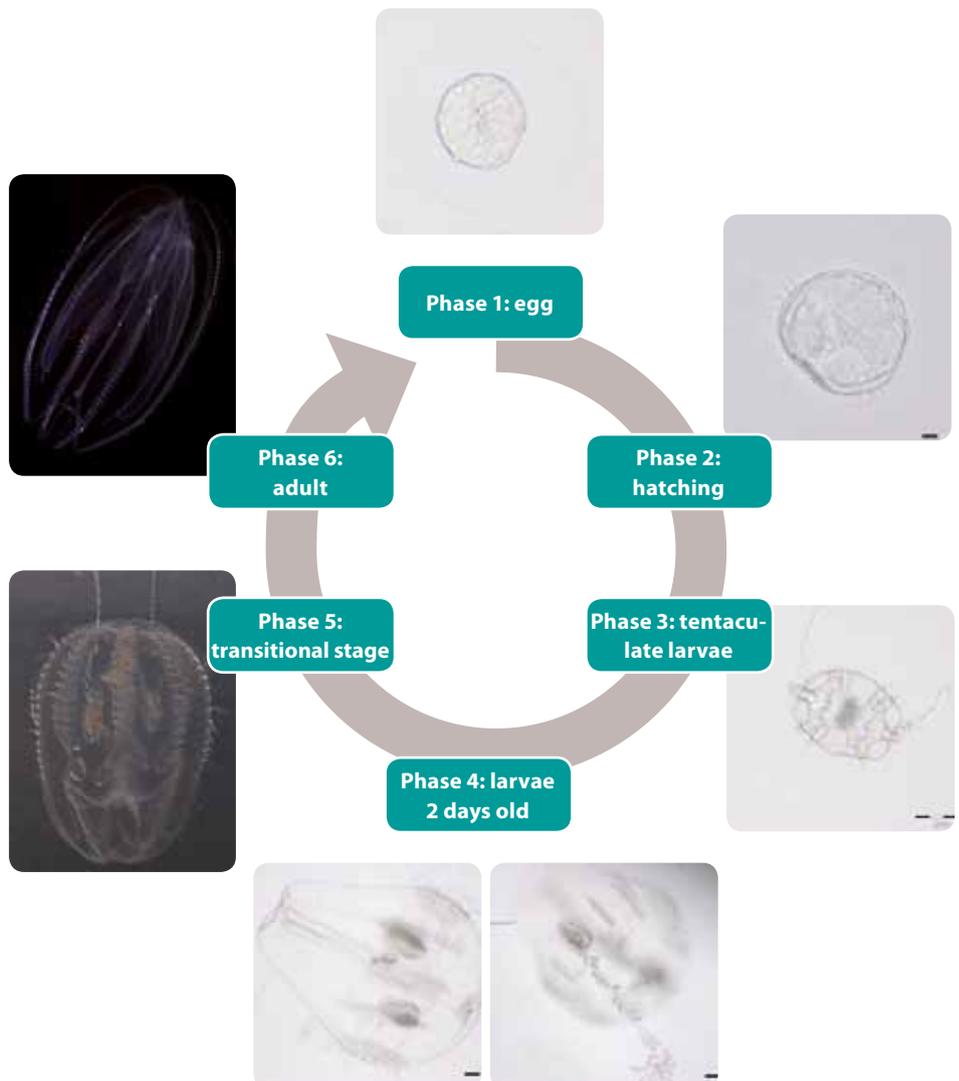
To assess the position of *Mnemiopsis leidyi* in the food web of the Southern North Sea, various experiments will be carried out at ILVO. For this, there will be a need for many of these animals. It is therefore crucial to have a stock culture of *Mnemiopsis*.

In late summer and autumn of 2011, the *Mnemiopsis* bloom started in Belgium and ILVO could start their stock by catching a few wild individuals and keeping them in aquaria.

Unlike jellyfish, ctenophores do not have two life stages (polyp and medusa). A fertilized egg of a ctenophore develops to a larva with tentacles,

resembling a miniature sea gooseberry (*Pleurobrachia pileus*) and swims freely in the water column. As it grows, lobes develop. The stage in which both lobes and tentacles are present is called the transition stage. Over time, the tentacles degenerate and an adult *Mnemiopsis* with lobes remains.

In September last year, ILVO obtained eggs, larvae and transition stages by feeding a varied diet to cultivating adults. Other factors (such as temperature, light regime, etc.) are possibly also important for growing *Mnemiopsis leidyi*.



## MEMO Workshop on Genetics

The second meeting of the project took place on 27 and 28 October, 2011 at ILVO, the lead partner (Ostend, Belgium).

There, a number of administrative issues were addressed and a workshop about genetics was organized. Information was given about FINS-PCR, population genetics and data analysis. Guest speakers were Gregory Maes (KU Leuven, Belgium) and Soren Bolte (IFM - Geomar, Germany) who gave a presentation titled "Genomics in the Sea: the application of genetic tools for invasive species analysis and monitoring" and "Population genetics and Mnemiopsis- what can we learn?". A press conference was also given in which Dr. Marco Faasse gave some background about the invasion of the feared voracious species.



» Memo workshop on genetics at ILVO in Ostend on 27th and 28th October 2011.

## Molecular analysis techniques help to identify *Mnemiopsis leidyi* individuals

The unambiguous identification of *Mnemiopsis leidyi* individuals was an essential issue at the start of MEMO-project. The project needed to be sure that *Mnemiopsis leidyi* could be discriminated from other ctenophores like *Bolinopsis infundibulum*, something that was difficult in the past.

The concerns were that *Mnemiopsis leidyi* has been mistakenly identified in the past, and *Mnemiopsis leidyi* individuals need to be detected in bulk plankton samples where, due to the fragility of small gelatinous plankton, morphological features are destroyed and visual identification is impossible. At the MEMO genetics workshop, a *Mnemiopsis leidyi* identification method based on molecular analysis was presented. In essence it exists of a DNA extraction followed by a PCR amplification of the ITS1 ('the internally transcribed spacer1') marker. The obtained sequence is subsequently submitted to a BLAST search in the NCBI-genbank database where a match with reference ITS1 sequences of *Mnemiopsis leidyi* is expressed in percent similarity. In this way, the presence of *Mnemiopsis leidyi* in the BPNS (Belgian part of the North Sea) and in the Baye de Seine could be confirmed. Future use of the ITS1 marker will consist in the preparation of a *Mnemiopsis leidyi* specific probe and primer

couple for the detection of *Mnemiopsis leidyi* individuals in fish stomach.



» Jellyfish in ethanol.

## VARIA

### New staff

Hannelore Theetaert (ILVO) will work on genetic identification of ctenophores.



### Workshops

MEMO Workshop on habitat modelling; 23-24 May 2012, CEFAS (UK)

### News

For the moment the European Commission is organizing a consultation round on Invasive alien species for a dedicated European legislative instrument. Consultation period is from 27.01.2012 to 12.04.2012. When Interested? [http://ec.europa.eu/environment/consultations/invasive\\_alien.htm](http://ec.europa.eu/environment/consultations/invasive_alien.htm)

## Can native predators control *Mnemiopsis leidyi* blooms?

Along with the other MEMO partners, Deltares (in cooperation with the Royal Netherlands Research Institute (NIOZ)) are experimenting with different ways to keep and culture comb jellies. Currently they have their comb jellies in a large round tank called a "planktonkreisel". Although this tank is too large for controlled experiments, it works well for stocking cultures and behavioral observations. In autumn 2011, they began catching many small *Beroe gracilis* comb jellies, which are known

to predate on other ctenophore species like *Mnemiopsis leidyi*. In their "planktonkreisel" they observed that even small *Beroes* attacked *Mnemiopsis leidyi* much larger than themselves, ingesting chunks of lobes and even pieces of the body itself! Through their next planned experiments they want to study the feeding behavior of *Beroe gracilis* and determine whether "handicapped" *Mnemiopsis leidyi* themselves will have decreased feeding rates.



» The ctenophore *Beroe gracilis* attacks the much bigger *M. leidyi*.

## Partner 3: ULCO-LOG

ULCO-LOG means 'Université du littoral Côte d'Opale - Laboratoire d'Océanologie et de Géosciences.'

The themes addressed by the LOG refer to Oceanology and Geosciences in coastal and littoral areas. The LOG is mainly, but not exclusively, focused on the Eastern Channel. Other research areas include French Guyana, the North Atlantic Ocean and the Mediterranean Sea. The LOG is organized into five research teams, each having their own objectives and expertise, but also working towards common goals and projects, such as the Observation of the Littoral Environment (SOMLIT) and the Automatic Monitoring Network for the Littoral Environment (MAREL), micro-scale studies, estuarine studies and development of ecosystem indicators.

The five research teams are:

→ Plankton ecology (bacterioplankton, phytoplankton, zooplankton, biological diversity,

fluxes, food webs)

- Benthic ecosystems and interface processes (shallow intertidal and subtidal zones)
- Biodiversity and climate (biodiversity, global change and natural fluctuations)

- Coastal morphodynamics (hydrodynamical, aerodynamical and sedimentary processes)
- Physical oceanography, transport and remote sensing (hydrodynamics, turbulence, remote sensing)



» Wimereux Marine Station (Université Lille 1) Maison de la Recherche en Environnement Naturel (Université du Littoral) in Wimereux (Pas-de-Calais)

## ULCO-LOG and MEMO

For activity 1, ULCO-LOG participated in the set-up of the Standard Operational Protocols (SOP) for sampling and preservation of gelatinous plankton through testing the SOP on existing and additional surveys in 2010 and 2011. ULCO-LOG contributes to the integrated database with (existing and new) data on the seasonal distribution of *Mnemiopsis leidyi* gathered via their SOMLIT network. Present data on the plankton and hydrology of the sampling points will also be collected to develop a habitat model by Ifremer. ULCO-LOG will collect samples of *Mnemiopsis leidyi* for

the genetic analyses carried out by ILVO.

In activity 2, ULCO-LOG contributed to a preliminary study on the maintenance and breeding of *Mnemiopsis leidyi* during the first year of the project. ULCO-LOG also assists in the sampling of life organisms. ULCO-LOG participates in setting up experiments and defining specific incubation devices. They contribute to the culture of *Mnemiopsis leidyi* and other key comb jelly species, will participate in the lab experiments in 2012-2013, and will provide a scanning electron microscopy device for stomach content analyses. ULCO-LOG

will contribute to the life cycle model by providing and sharing the data obtained during specific experiments with all partners. ULCO-LOG is involved in activity 3 in the construction of the dataset needed for the plankton ecosystem models and their participation in the development of the different casestudies. They will perform an ecological validation of the mathematical simulations and predictions that result from the different models. They will host the ecosystem modeling workshop in 2013.

## Interview of the month:

# An Introduction to Thomas Raud, Engineer at ULCO-LOG

Meet Thomas Raud, engineer at the Laboratory of Oceanology and Geosciences (LOG – UMR 8187 CNRS) of the University du Littoral Côte d’Opale (ULCO), Wimereux, France.

### **Thomas, can you briefly introduce yourself and explain why you work on gelatinous plankton?**

I will work on the MEMO project work as an engineer in marine biology. In 2004 I started my studies in geography and environmental sciences at the University of Lille. After I graduated, I obtained a Master’s Degree in marine and coastal environment at ULCO (Calais). During my Master’s studies, I worked specifically on copepod feeding under the supervision of Dorothée Vincent (PhD, ULCO-LOG). I really enjoyed working on zooplankton and this motivated me to continue my research on small bugs. I was therefore very enthusiastic when Dorothée Vincent and Jean-Michel Brylinski (Pr, ULCO-LOG) offered me to work on the new MEMO Interreg IVA 2 Seas project. Gelatinous plankton is a new field of research for me and is particularly interesting as the MEMO project concerns newly introduced species in the 2 Seas area.



» Thomas Raud.

The very surprising thing about *Mnemiopsis leidyi* is how this species, which originates from Northeast America, has adapted very well and is having a significant impact on ecosystems.

### **What will be your role within the MEMO Project?**

I joined the project in September 2011. I will contribute to the main activities of all the partners. I will participate on defining the spacial and temporal distribution of *Mnemiopsis leidyi* within the 2 Seas area. This includes sorting zooplankton samples collected along the French coasts of the Eastern English Channel as well as the North Sea. On the other hand, I study *Mnemiopsis* reproduction and feeding in the lab. This includes the setting up of feeding experiments in which physical and biological parameters (prey size, type, abundance; predator abundance) can be

modified. These experiments will give further insights into the successful way *Mnemiopsis* has spread in Northern Europe.

### **Why are you interested in studying *Mnemiopsis leidyi*?**

The very surprising thing about *Mnemiopsis leidyi* is how this species, which originates from Northeast America, has adapted very well and is having a significant impact on ecosystems that differ significantly in terms of salinity, temperature and prey assemblages. Given its high reproduction rate, *Mnemiopsis* is able to spread into a new environment each summer, although it nearly disappears from the field in winter due to low temperatures. In the Black Sea, *Mnemiopsis* induced drastic decreases in commercial fish species and caused dramatic economic loss.

Finally, *Mnemiopsis* seems to spread much more efficiently in enclosed seas or in calm water environments such as estuaries. This is the reason why turbulence and hydrodynamics are factors that will be considered in our experiments.

### **How are your work and integration within the project going?**

The MEMO project allows me to collaborate with a number of partners. The partnership developed with ILVO, particularly with Lies Vansteenbrugge and David Vuylsteke for cultivating *Mnemiopsis*, is really rewarding. The same holds for partnerships developed with Ifremer (Boulogne-Sur-Mer, FR), CEFAS (Lowestoft, UK) and DELTARES (Delft, NL). The MEMO project allows great communication between partners on the common subject of *Mnemiopsis*. The MEMO project has also permitted us to create a partnership with the Nausicaa Center of Boulogne-Sur-Mer so we can maintain the species in specific plankton devices (Plankton kreisel) and reproduce them efficiently. This will guarantee us to have a sufficient number of individuals for feeding experiments. Collaborations and partnerships developed within the MEMO project will give further insights into the understanding of *Mnemiopsis* biology and physiology and will allow a better prediction of its potential impact in the 2 Seas area.

Next time we present Lodewijk van Walraven. (Deltares/Nioz)