

ALGIERS - BARCELONA Saturday, Sept. 26 to Thursday, October 1

REPORT by Christian Sardet, October 6, 2009

- **ANNEXES** are only to be included in later messages addressed to personal Emails of coordinators for file size reasons. For people on Tara: **ANNEX 1, ANNEX 2 and ANNEX 3** are on board.
- **(1), (2), (3)**, etc. provide access in a separate page to documents (photos, videos, texts) which illustrate parts of the report In a link page (not included in messages addressed to people on board).

We received a very warm welcome in Algiers. After the arrival of Romain and Eric, many visits were organized with schools, institutes, local authorities and the French embassy. After an enthusiastic visit on the boat by motivated students from the Marine Environment Institute, Tara left "Alger la blanche" Saturday morning in high spirits and with perfect weather conditions.

Participants : On board were -- the crew: Hervé Bourmaud, Sam Audrain, Mathilde Menard, Marion Lanterce, Julien Daniel, and Mike ("from New Zealand")Lunn; a journalist, Sacha Bollet (see photo of crew **ANNEX 1**); the scientists: Hervé Le Goff, Margaux Carmichael, Julie Poulain, Jared Sawlwell; the Thalassa /MC4 media team: Bertrand Manzano, and Christophe Castagne. In Algiers Anne Gouraud joined the media team, replacing Loic Evenard, and Christian Sardet took the place of Stéphane Pesant on the scientific team.

Navigation and Stations :

Sunday and Monday we headed north/ north east to successively sample 2 stations in 2 gyre areas clearly visible on the Mercator/Coriolis maps sent by Gaby Gorsky (**ANNEX 1**).

The 3rd station (which at first was supposed to be "light" but turned out to be "heavy"), was sampled on Wednesday on the way from the Balears to Barcelona. The location is a reference open-water site called "D Station" by the Barcelona Marine Institute, which they've been sampling for many years. Silvia and Gaby provided the necessary information for the location and sampling.

Julie Poulain has established a comparative chart which uses colors to show at a glance the differences and similarities between the different stations sampled between Tangiers and Barcelona (see **ANNEX 2**).

We strictly followed the sampling plans established by Stéphane Pesant who had been mission chief from Tangiers to Algiers. We used protocols tested during that week and previously by people during trials or on board since Lorient (see reports of Hugo and the thorough report from Stéphane Pesant last week and the video: (see **ANNEX 2 : Une nuit sur Tara**).

Collecting :

The sampling started with the 2 Hervés: Hervé le Goff and Hervé Bourmaud had established the DCM, and proper sampling depths. Julie took care of bacteria and virus/girus sampling, and Margaux did protists. These 2 tasks represent a particularly heavy load of tube/chemical preparation, cleaning filtration and post-filtration work. Julie and Margaux assumed this challenging job, which requires many manipulations for several days in a cramped space. They used their previous experience of sampling to make improvements, but these manipulations are difficult. As a general rule we should not do a normal (heavy) sampling on 2 consecutive days. This is just too much and will lead to problems. (**ANNEX 3: Julie's's work and genomics**)

Fortunately, a very efficient and motivated team -- including many members of the crew -- ensured that the necessary pumping, manipulation of heavy gear and bottles, and their rinsing, filling, as well as net and Niskin bottle deployments proceeded smoothly over the course of a day (about 10-12 hours of pretty continuous work, except for lunch and dinner). The conditions helped us. We had good weather, not too much rolling, and only one interruption due to a brief thunderstorm on the 3rd sampling day.

Pressed by the need to setup the imaging equipment on board (a Stereodiscovery Macroscope from Zeiss), and by a need (clearly voiced by our MC4/Thalassa companions) to at last "get images", I could not spend as much time on deck as is usually expected of a mission chief. So, I ran up and down to take care of setting up imaging inside Tara. Luckily, Marion our wonderful cook (with oceanography training!) filled in and did an excellent job at collecting (nets and bottle sampling) as well as filtering and processing samples for carbonates and pigments (HPLC). Marion regularly provided me throughout the day with plankton samples from nets (180, 330 microns) -- a necessity considering that the temperature inside Tara sometimes rose to 30 degrees centigrade (!), and that plankton samples quickly go bad under such conditions.

Record keeping:

Samples were properly collected and recorded in books, as done in previous weeks by Hugo and Stéphane. (In addition, Stéphane's records have barcodes, temporarily on hold.) But these books proved to be unsatisfactory as a way of keeping and passing along permanent records of exactly what was collected, and how it was collected, processed and stored. Excel sheets listing all parameters have recently been provided by Stéphane Pesant. Steffi, Julie, Margaux and Marion filled out these sheets (to be added later as **ANNEX 4** of this report). We extensively discussed the issue of sample tracking and storage in Barcelona with Steffi. Rainer (who will transport the samples to their destinations) was in Barcelona and also participated in these discussions. I feel that the solution is near, using computerized tracking combined with barcoding and the server/database now being set up.

Another issue is protocols. I've attempted to condense the zooplankton sampling protocol into a 1-page color-coded text with 5 key photos extracted from video sequences made by Eric (filming Gaby demonstrating sample collection on the first leg. (see **ANNEX 3**). This simplified 1-page protocol is available in the sample collection area on deck. The same idea could be extended to other protocols. Sylvia said she would write the 1-page protocol for Bacteria, and Nadia Loddo, (the journalist from Metro who boarded Tara in Barcelona) said she would film Sylvia demonstrating. I could edit "video protocols" from short sequences made with the Kodak mini-camera that is now permanently on board. But this would require a lot of work!

Imaging :

Freed from sampling tasks, I mostly concentrated on getting a functional micro/macro imaging setup on board. Our reporter Sacha Bollet enthusiastically joined in. Setting up the superb Zeiss-loaned Macroscope & accompanying software required help from our expert cytofluorometer developer/programmer Jarred, who figured out some Axiovision software problems with Zeiss France on the phone. We captured about 100 images and films of the larger organisms collected with the different nets. With some differences among stations, they were mainly: large and small chaetognats, heliozoans of many sizes, various embryos and larvae, and many species of copepods. See **(4): The first images from Tara Oceans**

In terms of “gelatinous” organisms, besides different species of moderately abundant jellyfishes (micro to 10 cm) the most prevalent organisms in the nets by far were Muggiaes -- siphonophores which look like small rockets. See **(5) Siphonophore films**.

As far as establishing protocols for imaging, Urosh is making a “How to best handle the Macroscope and software” and I am starting to make up a “main organism checklist” that could join the Excel sheet (to be discussed). Protocols for Jarred’s cytofluorometer, and the FRRF machine, are in the works, and Flowcam on board should soon be activated .

For those who want to see images on board (acquired/unprocessed) they are in a Tara Images folder on the desk top of the Axioskop computer organized by stations (Stations 8, 9, 10). Or even better, ask Sacha Bollet to show you a selection of improved images. We will put a selection on display soon.

Another “imaging task” was setting up a small moveable wet lab in the “petite carré”. We could sort plankton on Gaby ‘s “Megatoscope”, and I ran tests with a newly acquired Canon 5D to shoot macro photos and videos of larger organisms (5mm to 20 mm). Using a small aquarium and a “photo arm” kindly provided by Christophe (who films for FR3 -- see videos on link page), we got some decent results. With improved lighting of the organisms, this setup will work even better. The equipment (including various sized aquariums) will be improved in Nice/Villefranche with Christian Rouviere and Patrick Chang from our Villefranche lab. All this equipment and aquariums can be stored in the bunks and on nearby shelves when not in use. We have discussed all this with Urosh who now takes care of imaging on board. He and Emmanuel Reynaud will work with us in Nice on finalizing the configuration. We may also be able to image some fixed protist samples collected by Colombar and Margaux this week using highpower microscopes in Villefranche.

Barcelona

Very intense days meeting the European Commission and journalists from many countries who came for a meeting organized by the EC. Excellent and complementary Tara Oceans talks by Etienne, Eric, Colombar, Chris and Michael at the meeting with the Press organized by the EC should help draw support. For those interested I have recorded all the talks.

Some remarks

Many issues were already raised in Stéphane Pesant’s report last week. This should be carefully read by all and discussed in Nice/Villefranche.

Here are some other points to reflect on:

- Improve the chain of command/communication about : why the stations are interesting / who are the scientific participants? / what they can do / not do / adapted sampling plan / installation and tests of new instruments / protocols.
- Complete / shorten / improve / color code / illustrate protocols
- Improve flow of collecting/ documenting / storage/ shipping
- Complete zooplankton collecting and quality of live material (light traps/ hand nets/ palettes)
- Complete imaging instrumentation (Emmanuel) . Discuss future and use of Fluorocytometer (had long discussion with Jarred).