REPORT ON POGO-PAP GreenSeas FELLOWSHIP PROGRAMME 2013

Trainee’s Report

Name of Trainee: Bellineth Valencia Ramirez Giraldo

Supervisor (Parent Institution): Dr Alan Giraldo

Supervisor (Host Institution): Dr Marja Koski

Dates of Training: 23/04/13 – 11/07/13

Subject of Training: Copepods grazing and pellet production: there are changes in particle production according to the sexual condition and vertical distribution?

1) Please provide a brief description of activities during the training period:

The activities done during the training can be divided in three periods: before the cruise (April 29 to May 29), during the cruise (May 29 to June 18), and after the cruise (June 19 to July 11).

During the period before the cruise all activities that I did were directed towards preparation of a work plan to be carried out during the cruise, as well as to develop the skills needed to work with live copepods during the cruise. After defining the target species for the experiments, I searched and read the methodology and results of around 70 research articles published for the copepod Calanus. As a result of these readings, I prepared a draft plan with possible methodology to be followed during the cruise and the experiments to be performed: egg production, hatching success, pellet production, grazing by copepods, grazing by microzooplankton (dilution experiment), and gut clearance. Likewise, during the period before the cruise, I did laboratory work that consisted mainly of learning to recognize female vs. male copepods, to sort out live females from a sample, and to carried out laboratory experiments (e.g. respiration, grazing, and egg production) with the guidance of Marja and DTU Aqua master students.

During the cruise, every day we carried out vertical tows to collect zooplankton samples with a WP2 net (200m to surface). From these samples, I sorted out Centropages sp. females because the copepod Calanus sp. were not observed during the first days of sampling. The samples collected and the experiments performed during the cruise were directed to assess the carbon budget of Centropages sp. by developing reproduction (egg production and hatching success), grazing, pellet, and respiration experiments (WP2 samples), and vertical distribution analysis by collecting stratified samples (Multinet). During twelve days of the cruise, I did a 24h egg production and pellet production experiments by sorting out 20 females and putting them individually in Petri dishes. From the eggs obtained, during four days of the cruise, I did hatching success experiments allowing eggs to hatch during four days. Additionally, I did two grazing experiments to quantify how much Centropages were eating and if they showed some preference for autotrophic organisms (measured by chlorophyll extraction during the cruise) or for heterotrophic organisms (microzooplankton counts). For this purpose, I collected water from the rosette from two different depths (chlorophyll maximum and below the chlorophyll maximum), and I took initial and final samples for chlorophyll analysis and microzooplankton counts (samples...
preserved in Lugol). Likewise, I did one experiment for microzooplankton grazing (dilution experiment) using also water collected from the two different depths, and I did two gut clearance experiments by performing five or six zooplankton tows, freezing the samples at -80°C, and sorting out the copepods and putting them in acetone for chlorophyll extraction.

After the cruise, most of the time was directed toward the analysis of the 40 microzooplankton samples collected during the two grazing experiments for copepods. Also, Marja and I had some meetings to talk about the analysis of the information obtained during the cruise and we planned the preparation of a manuscript with this information.

2) What applications of the training received do you envision at your parent institution?

There are mainly three applications of the knowledge that I gained during the training period, one that can be applied in a short term and two that can be applied in a long term of time. In a short term, the first purpose is to share the knowledge gained with undergraduate and graduate students that work with plankton in the Research Group in Oceanographic Sciences at University of Valle, letting them know about the research that other researchers are doing (DTU Aqua and PAP researchers) with the aim to attract their interest to explore a new line of research, and to encourage them to start to do small experiments with live zooplankton. In a long term, the aim will be to explore the possibility to do a project of carbon flux in the Colombian Pacific in collaboration with DTU and/or PAP researchers, and to explore the possibility to do a zooplankton course with Colombian professors that are working with zooplankton and DTU and other international researchers.

3) Please provide your comments on the Fellowship Programme.

For me, to have the opportunity to participate in this fellowship programme was an enriching experience. I learned a lot during the time that I spent at DTU Aqua laboratories, not only because of the facilities that they have to work with live zooplankton, also because I had the opportunity to share with master and Ph.D. students, and highly experienced researchers. Likewise, the experience during the cruise was very good. It was the first time that I participated in a so complete research in biological oceanography and in a research vessel so well equipped with large laboratories with everything that you need to do a state of the art research. Also, I had the opportunity to share with researchers from different countries that work in different areas. For all these reasons, I consider that I accomplished my purpose of participating in this fellowship programme and I consider that this is a very good opportunity for researches working in developing countries to learn from highly experienced researchers, to work in well equipped laboratories, to try to agree future collaborations between institutions (host and parent institutions), and in this way strengthen the research capabilities at the parent institutions.

4) Please provide details as to how your contribution towards living expenses was spent. Attach receipts for all major expenses.

For my fellowship programme, I received from POGO 1150 Euros per month for 2 months. For the first period, the stipend was spent as follows: 55% in accommodation, 11% in transportation, 25% in feeding, and 9% in laundry. For the second period, the stipend was spent as follows: 41% in accommodation, 9% in transportation, 25% in feeding, and 12% in laundry. There are no receipts for laundry because these were coin machines that did not provide receipts.
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Trainee’s Report

Name of Trainee: Veli Caglar Yumruktepe         Supervisor (Parent Institution): Dr Baris Salihoglu

Supervisor (Host Institution): Dr Richard Lampitt     Dates of Training: 05/05/13 – 23/07/13

Subject of Training: Model-Data Integration of Key Nitrogen Cycle Processes

1) Please provide a brief description of activities during the training period:

I can divide my activities at Southampton to three different parts. The first part was the pre-cruise time, where I have spent considerable amount of time for the preparation of equipment for the experiments. The experiments included incubations on deck, therefore we had to build a conceptual marine environment with different light levels, and constant temperatures in 4 parallel incubators. We had gained experience by discussing with the scientists that did similar work in previous cruises, and used their techniques and procedures for successful experiments. Use of similar techniques also provided us a comparison with their previous work. Apart from cruise preparation, I also had the chance to discuss with experts the modelling work that I am carrying on. I gave a brief talk about my previous modelling work for the PAP site, and later on had individual meetings with the experts. This way, we managed to discuss the problems in my model, and the ways to overcome those.

The second part of my fellowship was the PAP Site cruise in June. We carried out experiments focusing on the uptake of nitrate and ammonium by phytoplankton, and nitrification processes by nitrifiers. The experiments included incubations on deck representing the different light levels and depths in the marine environment, where at the end of the cruise, we further investigated the effect of changing pH on these processes. The idea behind this was to evaluate the influence of ocean acidification on the nitrogen cycle in the marine environment. We are hoping that the results will provide a direct estimate of crucial life cycle processes to be used in models, especially for the PAP site.

Third part of my fellowship was the post-cruise period, where I had intense discussions with experts from different fields. I needed guidance for the theoretical details in the model. These were the important processes of carbon and nutrient flow through state variables used in the models. I had discussions with experts about the fate of matter in the marine environment, mostly organic matter export to deep ocean, which is the main focus of my modelling study. These discussions included field observations and experiments, to satellite estimations. I also had the chance to talk to modelling experts, and discussed the theoretical background of my model and the strategy to be taken to incorporate new ideas, or new observations in the field.
2) What applications of the training received do you envision at your parent institution?

After the expertise I gained from this fellowship, we now have the conceptual experimental knowledge on how to build incubations on deck, sampling at sea, necessary laboratory work and their limitations. Our institute has the access to three different seas, with three unique ecosystems, the Mediterranean, the Marmara and the Black Sea. The technique followed at the PAP site will be carried on to these three seas and unique estimations of vital rates will be made. We are also planning to train new students, so that the technique can be sustained in time, and hoping that this study will be used in our time series stations at different regions.

Scientists in our institute are also running physical and ecosystem models in all of the seas mentioned. The modelling expertise will be transferred, and I will personally be involved in this issue, hoping to improve the modelling skills of my colleagues and their individual models.

3) Please provide your comments on the Fellowship Programme.

I can say that I truly gained a lot from this programme. I had the chance to work in a highly professional environment, and managed to meet many experts of my field. The personal communications I made was exceptionally valuable. I really believe that I will carry on working with them and hopefully collaborate on future scientific works. Also, the chance for me to attend a different and highly advanced vessel, and observe the state-of-the-art work scientists are carrying on was remarkable. I witnessed a well planned, and successful cruise, with all the scientific works linking with each other for a better bigger picture. I will try hard to achieve such a thing in our cruises back home.

I also thank all the POGO members, that made it possible for me have such an experience. From the beginning to the end, everything was flawless. Even though the fellowship was for nearly three months, including the planning and managing, it was much more than that, and really appreciate the effort taken.

4) Please provide details as to how your contribution towards living expenses was spent. Attach receipts for all major expenses.

I have spent 1300£ for the accommodation, including electricity, water, heating, internet and buss pass. This adds up to nearly 75% of what I had been offered by POGO. The remaining part of my scholarship was spent on food expenses alone.