

Climate-Mediated Reproductive Variation in Pipefish (*Syngnathus typhle*)

Purpose of the Visit:

The principal aim of my research visit to the Department of Hydrobiology and General Ecology at Odessa National University in the Ukraine was to formalize collaborative work with a group of Ukrainian researchers interested in the aquatic biodiversity of the Black Sea region. In addition to discussions concerning future collaborative projects, I was offered the possibility to take part in the sampling of nearshore fishes in the region surrounding Odessa.

Visit activities:

During my visit, I was based at the hydrobiological station of the department, a field station based on the shore of the Black Sea, south of the main city of Odessa. While the infrastructure of the station is quite basic, its director, Dr. Oleg Kovtun, has extensive knowledge of the biological diversity in the region, and both informal and formal discussions over the course of my stay provided new insights into the work of Russian and Ukrainian scientists on Black Sea fishes. Given my limited knowledge of Russian, all of our communications were only possible through the tireless translating assistance of Anastasiya Tarasenko, a Ph.D. student based at the station who is also the national coordinator of a non-governmental program aimed at increasing public awareness of Black Sea diversity.

Together with Dr. Kovtun, I sampled pipefish populations in the region of the biological station and in the Tiligulsky Estuary, a site 50 kilometers east of Odessa which experiences extreme fluctuations in salinity. Given the rocky structure and depth profile of these habitats, it was only possible to collect pipefish by SCUBA diving, a rather different experience from my previous experiences with pipefish, which are typically collected by beach seining.

One day of my visit was spent on the campus of the University, where I had a chance to meet Dr. Veniamin Zamorov, the Dean of the Biological Faculty, and Professor Vladimir Ivanitsa, the Prorector of Science at the National University and the head of the Department of Microbiology. We had a frank discussion about the state of science in our respective countries in which I took the opportunity to tell them more about programs of scientific exchange supported by both the ESF and the University of Zurich. They expressed particular interest in the University of Zurich's international undergraduate summer school in biology, which gives students from outside Switzerland the chance to visit Zurich for an intense ten week program, where they have the opportunity to work on an independent research project and to learn more about recent advances in the biological sciences. As the National University in Odessa hopes to soon secure funding for new investments in molecular biology infrastructure, both Dr. Zamorov and Prof. Ivanitsa were excited about the possibility that one or more students could first receive exposure to these techniques in Zurich. It was agreed that this program would be an excellent vehicle to foster collaboration among our laboratories.

I also presented my research to the Department in a talk entitled, "Environmentally-mediated reproductive variation in nearshore pipefishes". Once again, as language was a barrier to scientific communication, Ms. Tarasenko provided a "real-time" translation of my talk, another new experience for me and one which appeared to be successful, given the diversity of questions from faculty and students after my presentation. I ended my presentation with a short introduction to opportunities for Ukrainian undergraduate and graduate students and, once again, several individuals were very enthusiastic and seem likely to visit Zurich in the near future.

Main results obtained:

The pipefish samples collected during my visit will be integrated into an existing dataset investigating morphological and genetic variation in European populations of pipefish. The analysis of this material seems certain to yield unique insights into the evolutionary history of Black Sea pipefishes.

Future collaboration with the host institute:

While laboratory facilities in Odessa remain quite basic, the exceptional local knowledge of ecological and environmental variation and keen interest in modern molecular methodologies suggest that this ESF-funded visit was only the first in what is likely to be a long-term collaboration between Ukrainian and Swiss scientists. Two collaborative projects have already been initiated, the first a study on temporal variation in the reproductive behaviour in local pipefish (with Oleg Kovtun) and the second, a study together with Veniamin Zamorov investigating genetic structure in Ukrainian populations of the commercially important round goby (*Neogobius melanostomus*). Students from the Ukraine will likely be involved in both of these projects.

Projected publications resulting from the grant:

As outlined above, the analysis of the Black Sea collections of pipefish will be integrated into an as yet unpublished dataset including pipefish populations from Sweden, France, Portugal, Spain, Italy, and Turkey. This exceptionally broad geographically sampling will offer a unique perspective on both the morphological and genetic diversity of syngnathid fishes in Europe and will provide an excellent model for future studies investigating aquatic biodiversity in European waters.