JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/Conference Title: Siberia 2008: The Baikalian Oilfish Project.....

Travel Dates: 15/08/2008 - 21/09/2008.....

Location: Irkutsk region, Russian Federation .....

Group Member(s): Anna Ermakova, Piotr Gierszewski, Marta Sarzynska, Lukasz Szydlowski, Angela Rose Thomas.....

Aims: Expedition aims:

1. To check the effect of melatonin and other photoreceptors like opsin in Golomyanka photoperiodism, by checking their concentrations at different times within the 24 hour cycle.
2. To investigate ecological-evolutionary peculiarities of population structure of Comephorus baicalensis:
    - investigate the population structure of big Golomyanka using genetic markers and a set of morphometric features
    - investigate the interspecies polymorphism of 2 Golomyanka species via the analysis of nuclear genome
3. To investigate the structure of blood in Comephorus baicalensis and Comephorus dybowskii as a physiological adaptation to living in depth.

Research topic 1 was our own research whereas topics 2 and 3 were the projects currently run by the Limnological Institute, which we participated in. Unfortunately, due to difficulties in obtaining necessary reagents (melatonin ELISA kit) we were unable to perform research topic 1. After the arrival, it turned out that the Institute has limited the research projects mentioned in point 1 and 2. Instead, we were offered to participate in an ongoing project investigating sensoric systems in Cottoid fish of Lake Baikal, and perform the Golomyanka's population structure studies, but on a smaller scale.

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OUTCOME (not less than 300 words):-

After arrival to Irkutsk, we were first shown around the Institute's facilities for the few days (18-26 August). From 26/08 to 02/09 we where doing fieldwork, being situated at the Institute's Biological Station in Bolshiye Koty, on the Lake Baikal shore. Our fieldwork included:

- putting and collecting nets to catch Comephoridae and other Cottoid species (Cottocomephoridae) for further examination
- fixing muscle samples used for genetic research in ethanol
- fixing brain samples used for auditory system research in glutaraldehyde
- washing brain samples from glutaraldehyde with phosphate buffer and further fixing using osmium

Brain samples consisted of otolithic organ and epithelial macula that is stimulated by otolith movement. Both of them are a part of fish hearing apparatus and are responsible for fish balance.
Muscle samples were used for further purification of mitochondrial DNA.
Fixed samples were then taken to the Limnological Institute in Irkutsk and further analysed in the laboratory. The lab work included:

- Extracting and sequencing cytochrome B DNA from muscle tissue samples of *Cottocomephoridae,* using PCR technique for DNA amplification and primers selective for cytochrome B gene
- Analysing the polarity of hair cells in macula using SEM (Scanning Electron Microscope)

Expedition outcomes/benefits:

Both of the research projects we were involved in had been run for longer, Nevertheless, the study of fish hearing apparatus resulted in a scientific publication “Growth of the Otolith of Baikal Cottoid Fishes (*Cottoidei*) in connection with the Development of Touch Acoustical Epithelium” that we co-authored.
The team members learnt the PCR technique during the population genetic studies, as well as operating SEM. During fieldwork, such skills like identification of caught species and taking samples were also developed. This is beneficial for our further studies.

Data and materials collected by us are going to be used by the Limnological Institute as the projects are still running.