

Evolutionary and taxonomic diversity of marine invertebrates

August 2017, St Petersburg and White Sea, Russia

ECTS: 7
Level: Masters, PhD
Language: English
Fees: transport, accommodation and living expenses; please contact organizers to inquire about estimates
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Application deadline: 15 February 2017

Application form and detailed timeline will be on zoology.bio.spbu.ru

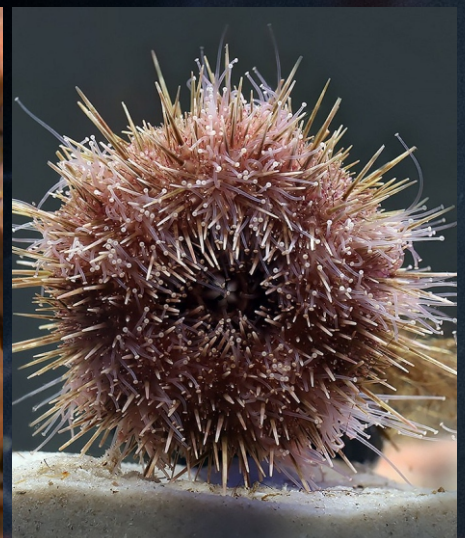
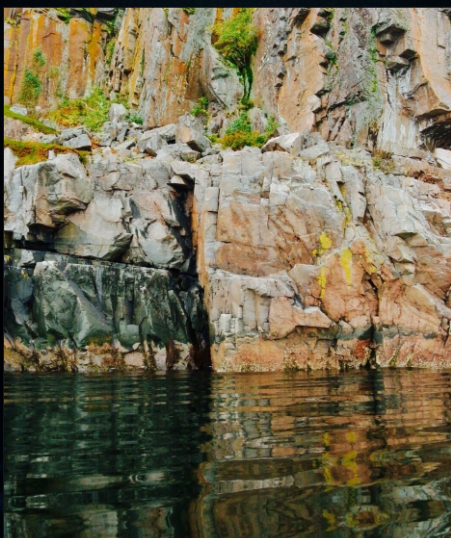
Academic content

The main objective of this course is to demonstrate evolutionary and taxonomic aspects of marine invertebrate biodiversity and the impact of ecological factors on adaptive radiation within different phyla. The students will get familiar with the current phylogeny of Metazoa, with main phyla of marine invertebrates and traits of their evolution. The course has a special emphasis on the invertebrate diversity in major types of marine communities. Lectures provide the general framework, while extensive field and lab activities will enable students to follow the patterns of invertebrate life strategies. This approach gives experience of implying general zoology to ecosystem studies.

Learning outcomes

Upon completing the course the students will:

- have an idea of the Metazoa macrosystem and taxonomic structure of the main phyla;
- be able to attribute an animal to the high-level taxa (phylum, class, order);
- be able to use keys for genus and species level identification;
- know the abundant species of invertebrates;
- know major components of invertebrate fauna in different types of marine communities;
- know the features of invertebrate fauna in Arctic and Subarctic seas;
- be able to collect samples in nature and deal with living animals in the lab;
- be able to summarize observations on animals' external and internal morphology in a zoological drawing.



Part 1. St Petersburg, Department of Invertebrate Zoology (SPbU)

Classes will run for 4 days from 9 am to 5 pm with short breaks and a lunch break.

Evenings will be free with optional cultural and entertainment activities.

One full day will be provided to prepare for an assessment.

Total: 14 hours lectures, 10 hours lab classes, 10 hours self-study, 2 hours exam

Lectures and relevant labwork:

- Eukaryotic diversity. Multicellular design.
- Design of Porifera vs Eumetazoa.
- The diploblastic design: Cnidaria.
- The life history in the cnidarians: metagenesis. Colonial animals.
- Bilateria. Acoelomate animals: Plathelminthes.
- The body cavities: pseudocoel and coelom. The coelomic design.
- Metamery and tagmata: Arthropoda.
- Embryogenesis and early development in Metazoa.
- Phylogeny of Metazoa. Body plan complexity.

Assessment format:

multiple choice test

Part 2. Marine Biological Station (SPbU)

Classes will take 8 hours a day. Actual timetable will depend on station schedule, weather and tides.

There will be one day-off and one free day to prepare for an assessment.

Total: 34 hours fieldwork, 20 hours lectures on ecology and communities, 20 hours lectures on animal taxa, 34 hours lab work, 12 hours self-study, 4 hours exam.

Fieldwork sampling localities:

intertidal mudflat, rocky intertidal, rocky and soft-bottom subtidal, mussel bank, tide pools, kelp forest.

Lectures on ecology and communities:

- Marine environment
- White Sea
- Intertidal and subtidal environments (rocky and mud-flat intertidal community, kelp forest community etc.)
- Epibiosis
- Feeding strategies in marine invertebrates
- Plankton
- Parasites in fish and marine invertebrates

Lectures and relevant lab activities on animal taxa:

- Porifera
- Ctenophora
- Cnidaria
- Turbellaria
- Priapulida
- Chaetognatha
- Crustacea
- Pycnogonida
- Nemertea
- Bryozoa
- Brachiopoda
- Polychaeta
- Polyplacophora
- Gastropoda
- Bivalvia
- Hemichordata
- Echinodermata
- Ascidia

Lab activities include observations, identification using keys, drawing and dissections.

Assessment format:

- two written questions (description of a taxon and community)
- identifying 4 unknown animals using keys
- oral quiz on common species identity and ecology
- evaluation of drawings made throughout the course

All assessment components (including the test in the city) contribute to the final grade equally.

All components must be passed in order to pass the course.