mar600 - Profile Module Methods in Aquatic Microbial Ecology

Module label: Profile Module Methods in Aquatic Microbial Ecology
Module code: mar600
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master's Programme Microbiology > Mastermodule

Module responsibility
- Meinhard Simon

Authorized examiners
- Alle hier genannten

Module counselling
- Thorsten Henning Brinkhoff

Entry requirements
For the practical course lecture: Methods in Aquatic Microbial Ecology

Skills to be acquired in this module
- The students learn to:
  - Analyze bacterial substrates at ambient concentrations such as dissolved amino acids and carbohydrates by high performance liquid chromatography (HPLC), organic carbon by TOC and POC/PON analyser and the composition of the pool of dissolved organic matter by Fourier-Transform Ion Cyclotron Resonance Mass spectrometry (FT-ICR-MS).
  - Determine bacterial cell numbers by flow cytometry and epifluorescence microscopy and to analyse these data by image analysis.
  - Extract bacterial DNA from water and sediment samples.
  - To amplify bacterial genes by specific primers and PCR.
  - Assess bacterial communities by culture-independent methods such as denaturing gradient gel electrophoresis.
  - Present and discuss scientific results
  - Write a scientific protocol
  - The students gain competences in:
    - Understanding how to analyse dissolved substrates of heterotrophic aquatic bacterial communities by state of the art approaches.
    - How to assess the abundance of aquatic bacterial communities by state of the art approaches.
    - Analyzing the composition of bacterial communities by PCR-based culture-independent approaches.

Module contents
Methods in Aquatic Microbial Ecology: The course starts with a lecture introducing basic issues of aquatic microbial ecology with an emphasis on methodological aspects. This lecture is completed before the practical work starts. During the practical course of a block of two weeks the participants carry out analyses and experiments on:
- Determining the concentration of dissolved organic substrates (amino acids, carbohydrates, dissolved and particulate organic carbon).
- The abundance of bacterial communities in aquatic systems
- The composition of bacterial communities in environmental samples by denaturing gradient gel electrophoresis (DGGE) of 16S rRNA targeted gene fragments.

The main emphasis is on analyses and approaches of bacterial communities in the water column.

Reader's advisory
Lecture notes, available on Stud.IP

Links
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Reference text: 6 CP | SE; PR | 1. or 3. FS | Simon
Modullevel: MM (Mastermodul)
Modulart: Wahlpflicht
Lern-/Lehrform / Type of program: Lecture, seminar (2 CP, 1 SPPW), practical course (4 CP, 4 SPPW)
Vorkenntnisse / Previous knowledge
<table>
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<tr>
<th>Examination</th>
<th>Time of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
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<td>One assessment of examination: Portfolio (seminar presentation, written protocol) Protocol (100 %), seminar presentation (no mark). Active participation (Active and documented participation in practical courses (labs, exercises, seminars, field trips) and courses. These include e.g. the delivery of exercises, writing a lab report or seminar presentations according to the advice of the course supervisor.)</td>
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**Total time of attendance for the module**

70 h