

Announcement: Master thesis project in the department of Biological Oceanography

Topic: Global distribution of newly discovered marine fungi based on molecular evidence from metabarcoding studies

Description: Parasitic fungi are key to microbial interactions and biogeochemical cycles in the global ocean. By infecting phytoplankton, they act directly at the base of aquatic food webs, affecting, e.g., primary production and nutrient fluxes. Despite this anticipated importance, however, little is known about their diversity and biogeography in the global ocean. In recent years, new fungal species have been isolated from the environment. As these novel species were only recently described, they were likely overlooked in previous surveys of fungal diversity in the ocean. In this master project, we therefore aim to use genetic markers of novel fungal species to estimate their global distribution by mining available sequencing data sets from marine plankton samples. The project will pursue the following approach:

- 1) Review of public sequence data sets to identify suitable taxa for analysis.
- 2) Creation of a reference database including the genetic marker sequence of the novel species as well as those of close relatives.
- 3) In-silico assessment of primer performance to determine if (i) the available public data sets may theoretically contain sequences of the novel fungal species and (ii) the phylogenetic resolution of the theoretically amplified fragment is sufficient to distinguish the novel species from other taxa.
- 4) Bioinformatic analysis of the selected data sets from public repositories to obtain geo-referenced occurrence data for the novel fungal species.

The analyses for the project are computer-based and can be completed in home office (if home office is required by the effective regulations) provided that a stable internet connection and laptop or desktop PC (with online conferencing equipment) are available. Prior experience with R and/or the linux command line is advantageous.

Start: TBD (no earlier than February 2022)

Duration: 6 months

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