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**DEGREE:** Philosophiae Doctor  
**FACULTY:** Faculty of Mathematics and Natural Sciences  
**DEPARTMENT:** Department of Biosciences  
**AREA OF EXPERTISE:** Marine biology, phycology, monitoring  
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**DISSERTATION TITLE:** *Identification and quantification of ichthyotoxic flagellates*

The world's oceans contain billions upon billions of microscopic organisms called microalgae. These single celled organisms make up the lowest level in the marine food web; they are the basis for all marine life. While the vast majority of microalgae are completely harmless, some species produce a range of different toxins which can be harmful towards humans, other mammals and fish.

My work focused on a group of microalgae often not prioritized in research- and monitoring efforts; small flagellates that are harmful to fish. The work resulted in a qPCR assay which both can detect the presence of the targeted species and calculate how many cells there was in the water sample. The assay was tested on samples collected monthly for three years in Outer Oslofjorden and can, if applied, be utilized in the microalgal monitoring effort.

The main objective of my PhD work was to develop a fast, reliable and cost-efficient detection- and enumeration method, which could be used for species currently present along the Norwegian coast. However, to develop the qPCR assay it was necessary to learn more about the targeted species. Therefore I conducted extensive genetic and morphological studies on algal material gathered from around the world, resulting in the description of a species new to science. The field material from Oslofjorden was analysed extensively with more traditional microscopy methods, providing new information on the distribution and occurrence of fish-toxic species. It also allowed for comparison between our local strains of the species with populations from other areas.

This study has been a part of TOXALGAE, a collaboration project between scientists from Norwegian Institute for Water Research (NIVA), University of Oslo (UiO), Ocean Research Institute (HI) and University of North Carolina at Wilmington (UNC-W), funded by the Norwegian Research Council.