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AREA OF EXPERTISE: Marine Biology
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DISSERTATION TITLE: *Diversity and community dynamics of protists and their viruses in the Skagerrak*

Marine coastal areas are among the most productive ecosystems in the world. Protists are an extremely diverse group of mostly unicellular microeukaryotes and includes the microalgae. They are the basis for the majority of the marine life and play key ecological roles in marine ecosystems. This makes it essential to characterise who the main players are. In addition, protists have an important biotechnological value. Further, some microalgae may be toxic and have adverse effects, negatively impacting on the economy, animal and human health and tourism. Yet, protist diversity in marine habitats, especially the smaller nano- and picoplankton, is still poorly described and under-sampled.

Due to their small size, protists can be difficult to identify by microscopy. Molecular methods, such as metabarcoding, which is based on the analysis of the DNA sequences in an environmental sample, may be powerful tools to provide qualitative and quantitative genomic information on microbial communities.

A new doctoral thesis at the University of Oslo is the first to perform studies on the diversity and seasonal patterns of protists and their co-occurring viruses in the Skagerrak coastal waters by metabarcoding. In her doctoral research, Sandra Gran and co-workers found a greater diversity of marine protists compared to previous surveys by microscopy through decades, giving a better understanding of the microbial community in the outer Oslofjorden, Skagerrak.

Sandra Gran's thesis revealed a strong seasonal variation of protists and their viruses. The protist diversity was highest during late summer – early autumn and lowest in winter. The algal viruses also showed temporal variation in diversity, but without a clear seasonal pattern when studying the community as a whole.

Several biotic and abiotic factors can drive changes both in abundance and diversity of these microorganisms. Sandra Gran's findings revealed that temperature and salinity could explain some of the annual variation in protist community composition. However, the greatest part could not be explained by any other chemical or physical factor tested.

These results demonstrate that a vast diversity of microalgae and other protists in the sea remains to be described both morphologically and genetically, even in a well-studied area as the outer Oslofjorden. Consequently, this thesis may serve as a baseline for future studies and monitoring programs to reveal the effects of environmental and climate changes on marine life and water quality.

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