

DNA barcoding zooplankton

Zooplankton play an essential role as secondary producers in marine pelagic food webs and typically exhibit rapid responses to environmental change making them suitable as indicators of ecosystem health and biodiversity. However, they are notoriously difficult to identify using taxonomic keys. DNA barcoding and metabarcoding have been proposed to rapidly characterize biodiversity but require taxonomically complete and geographically comprehensive reference databases of DNA sequences to accurately identify organisms to species level. There is a paucity of DNA barcode records for marine zooplankton taxa occurring in South African waters. This project will generate DNA barcode records (COI) and 16S rDNA sequences for zooplankton groups focusing on the Euphausiidae (krill), Amphipoda and Chaetognatha (arrow worms). These groups have thus far been neglected for DNA barcoding studies. The potential impacts of this study will be contributions to generating a comprehensive DNA barcode reference library for zooplankton. It will also provide unique opportunities for discovery of new species, for revision of taxonomic ambiguities, and highlight key species for further phylogenetic studies using suites of molecular markers. The reference library will greatly enhance the potential of using DNA metabarcoding for swiftly surveying biodiversity and as a tool for long-term monitoring of zooplankton assemblages at selected sentinel sites. Rapid and long-term monitoring surveys of zooplankton diversity will be important for benchmarking present biodiversity so that future shifts in species distribution due to climate change can be measured.