

An understanding of evolutionary history benefits people who manage the Earth's bio-resources for society. The aim of this project is to improve our understanding of the recent evolutionary history of an Antarctic salp (Chordata: Tunicata: Thaliacea: Salpidae), from the present day to hundreds of thousands of years ago, to ultimately benefit the management of marine polar resources.

Salpidae, in contrast to the Antarctic crustaceans, are characterized by a higher flexibility to their environment including a higher thermal spectrum. Salps effective life cycle (metagenesis), which includes both a sexual blastozoid and asexual oozoid form, causes a rapid development of salps leading to mass aggregations known as "blooms". This phenomenon results in the simultaneous exclusion of the other zooplankton representatives, leading to significant changes in polar marine ecosystem structure and function.

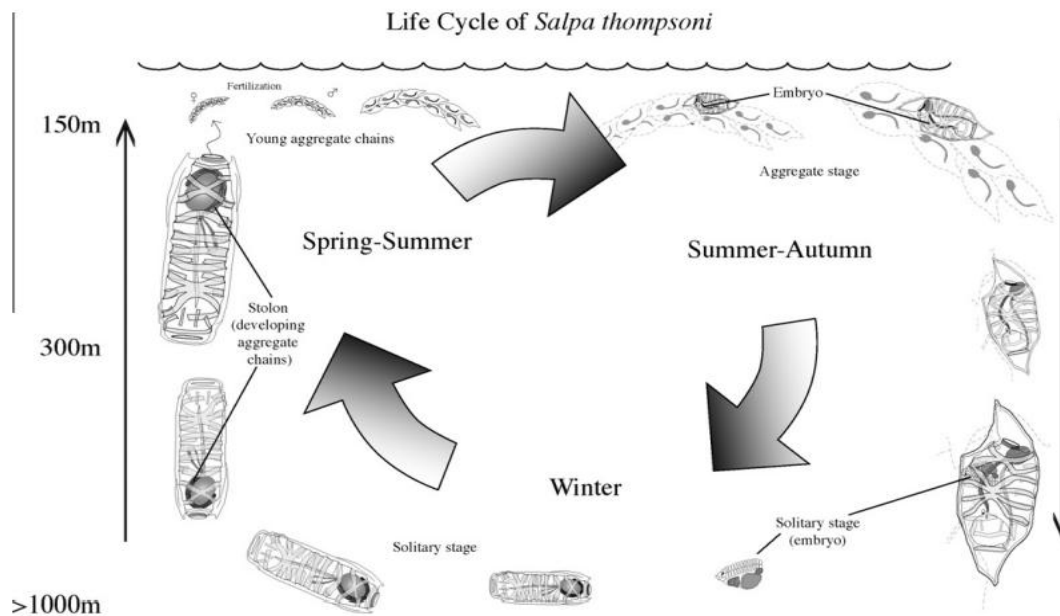


Fig. 1. Life cycle and migration of *S.thompsoni*; divided into two reproductive forms- blastozoid and oozoid (Loeb and Santora, 2012).

The purpose of this project is to reconstruct a demographic trajectory for the Antarctic salp *Salpa thompsoni*. Despite several ecological studies considering present day population dynamics, there have been no DNA-based inferences of the historical demography of this salp. Ecological studies suggest that salp numbers have increased in the Southern Ocean as a response to recent global warming; however, it is not clear if this is a short-term process or part of a longer-term period of demographic change. By reconstructing the demographic trajectory of *S. thompsoni*, it will be possible to place the short term changes in salp numbers observed in ecological studies into a longer term evolutionary context.

This project will take advantage of next-generation sequencing technologies and the most up-to-date analytical techniques to generate robust estimates of salp historical demography. To maximize the value of output from the project for biodiversity management purposes, analyses will also be conducted to investigate links between the demographic trajectories obtained, data on present day salp abundance, reproduction efficiency and life cycle, and reconstructions of past climate change. This will help management bodies to understand the status of the studied salp populations and how they might respond to future climate change.