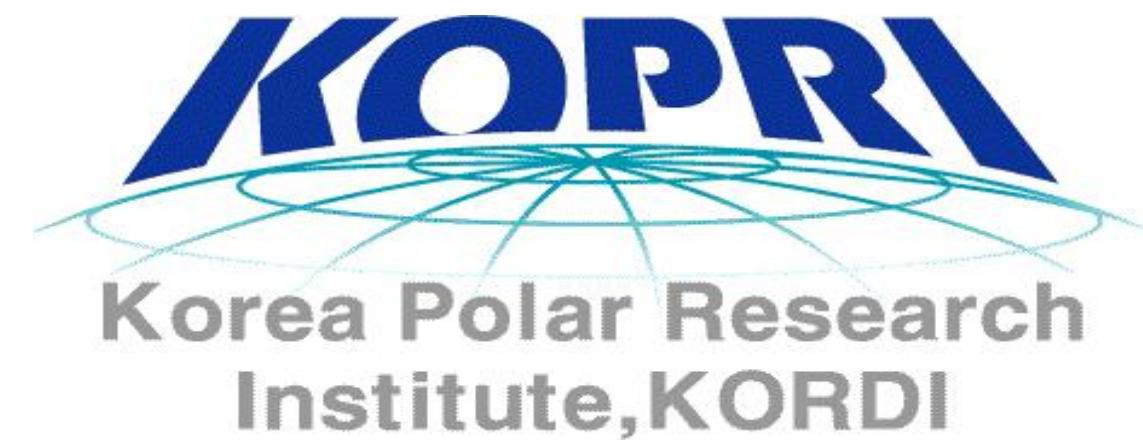




# KOPRI Culture Collection for Polar Microorganisms (KCCPM)

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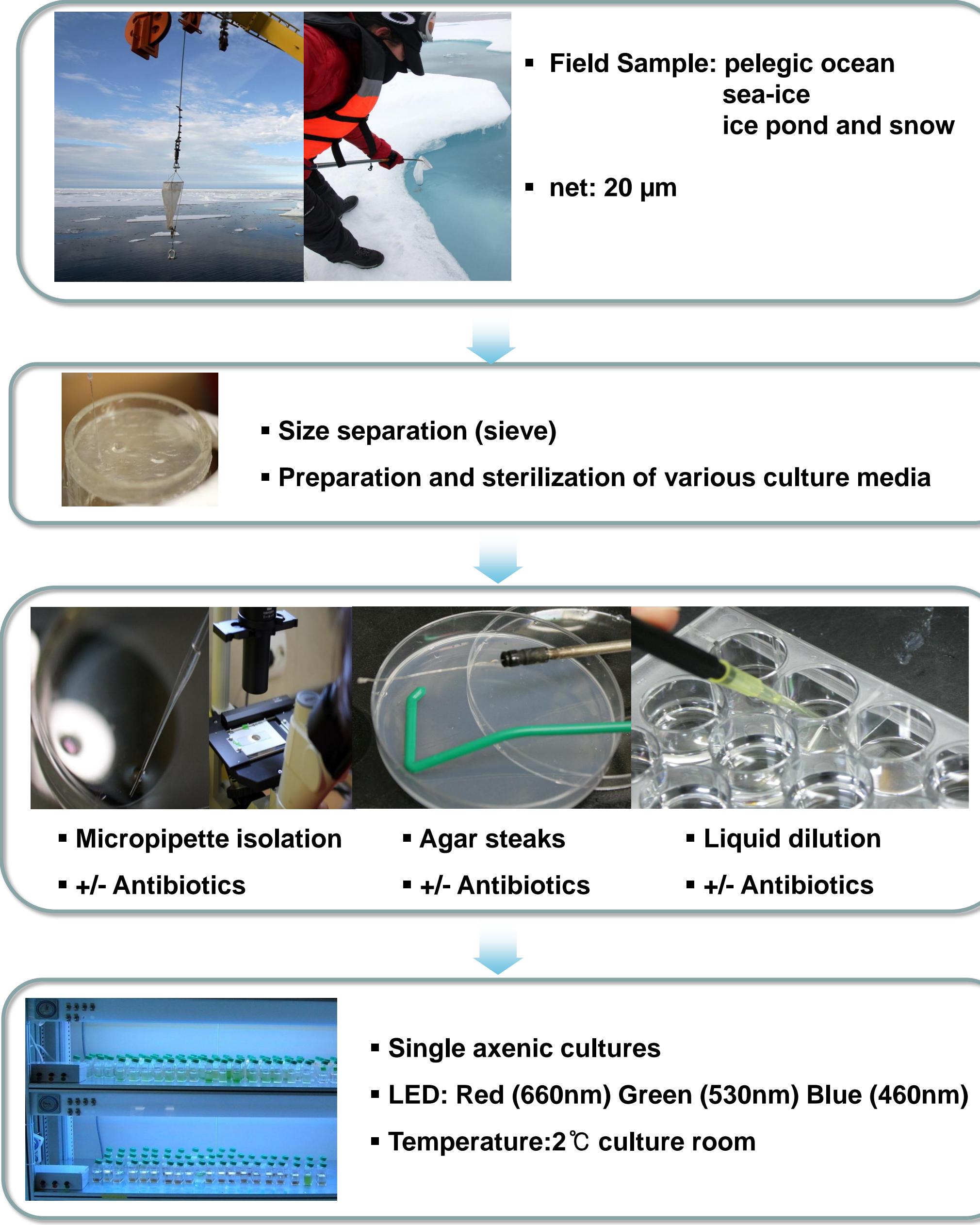
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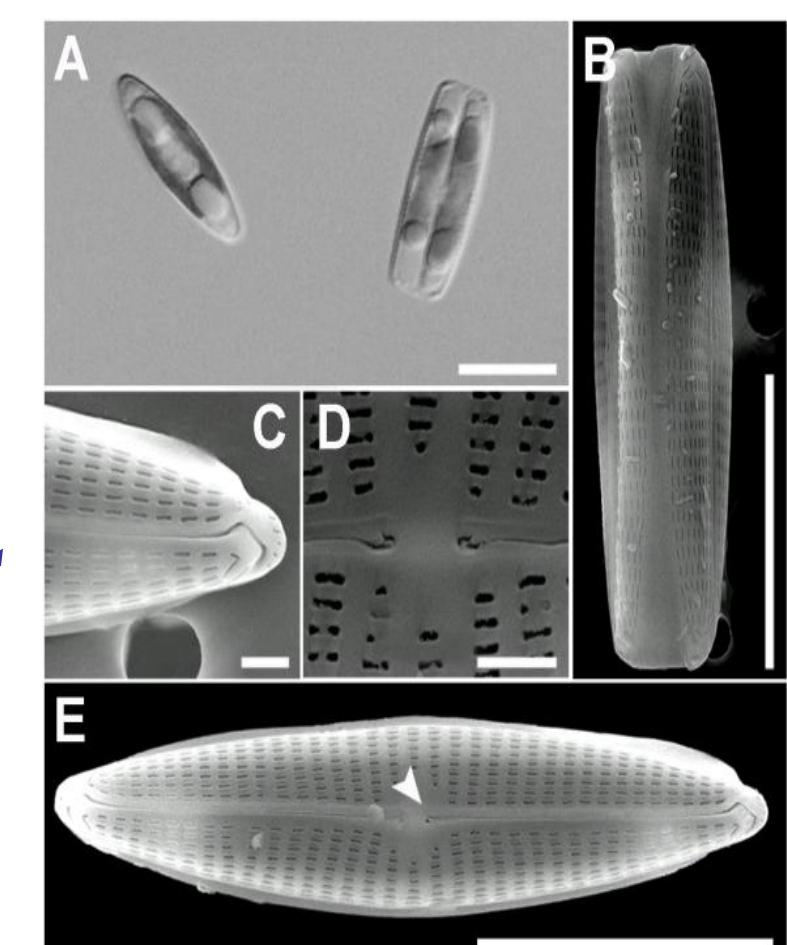
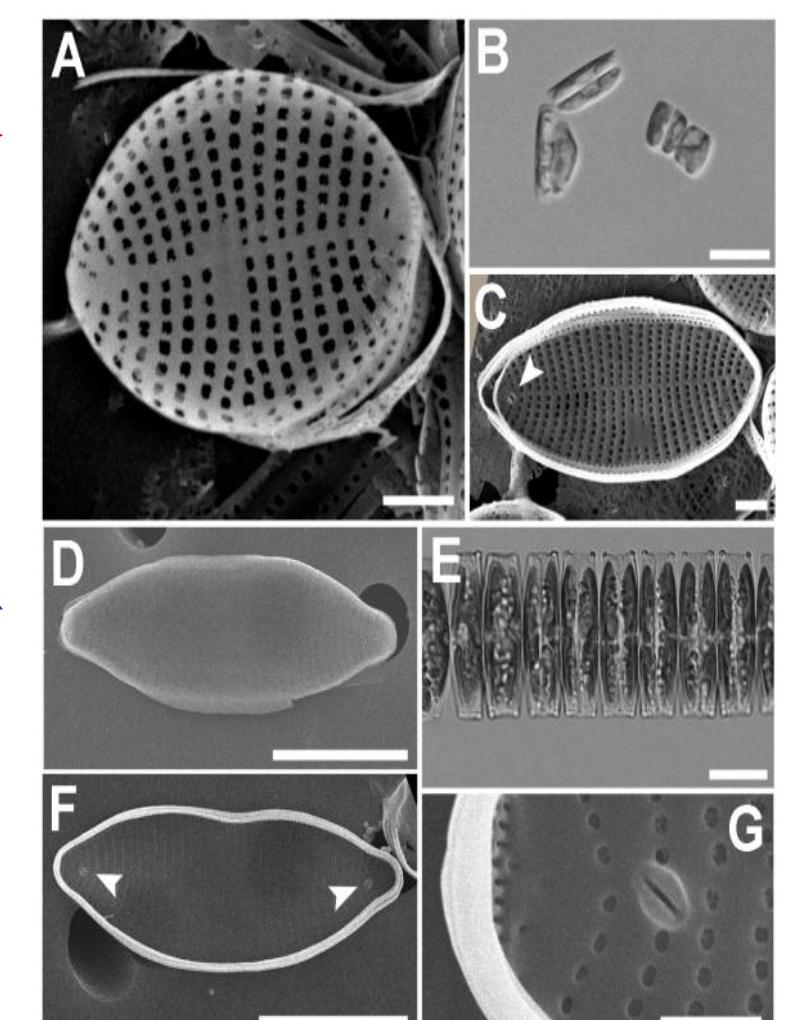
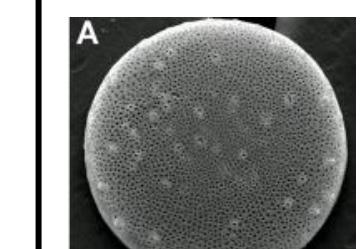
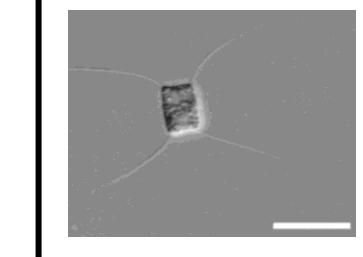
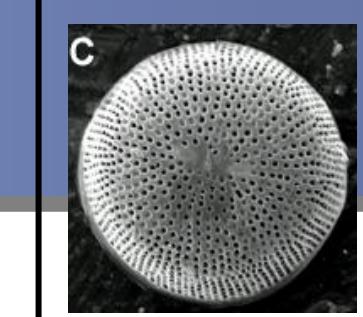
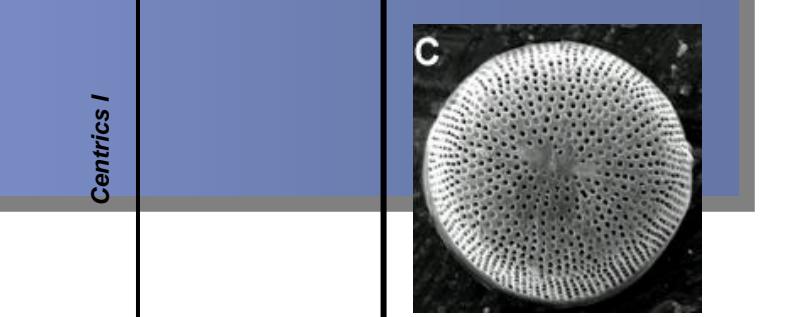
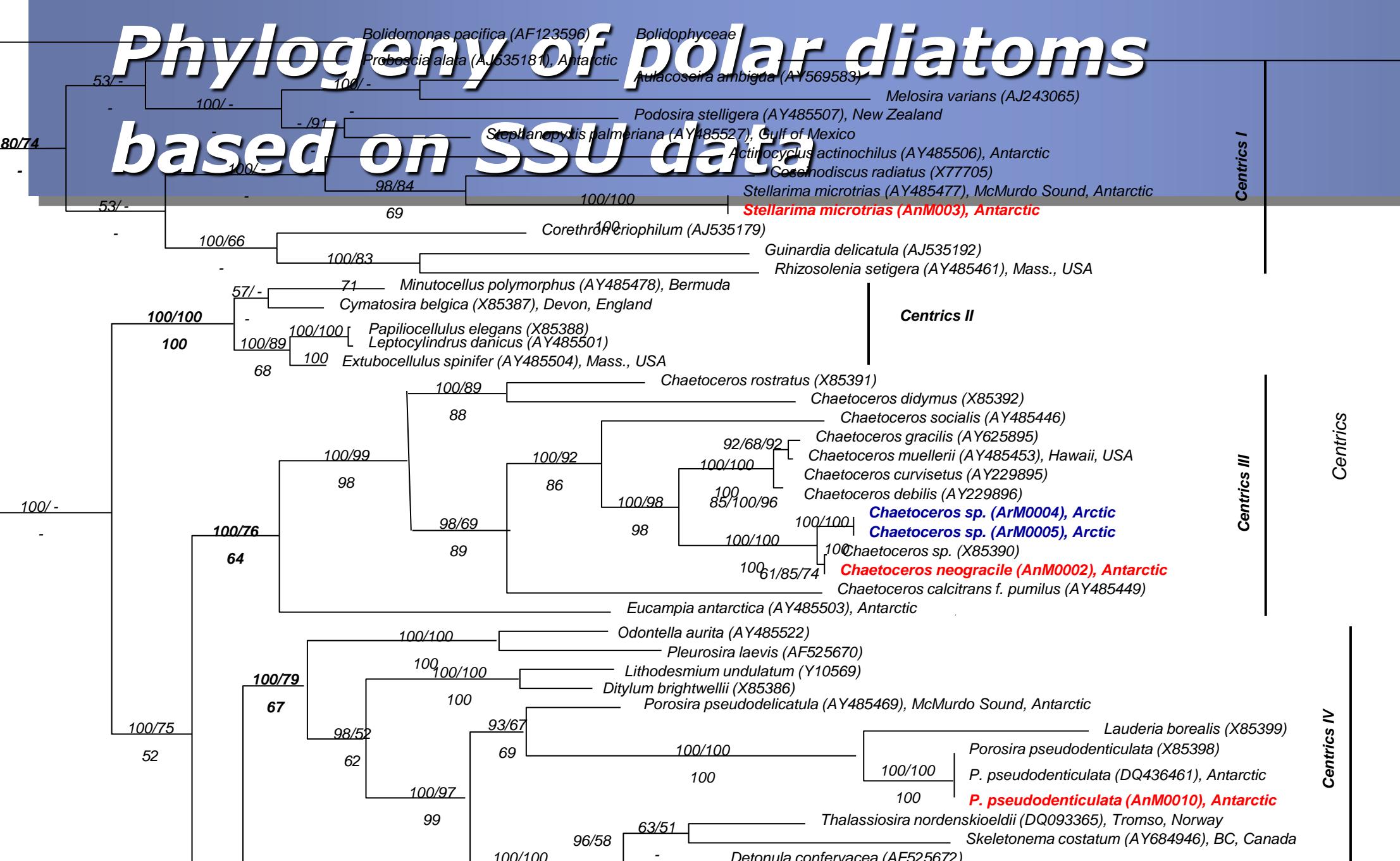
## Abstract

Korea Polar Research Institute (KOPRI) Culture Collection for Polar Microorganisms (KCCPM) is the culture collection for polar algae. Since 1989, we have collected various psychrophilic polar organisms including microalgae and macroalgae near King Sejong Station, Maxwell Bay, King George Island in the Antarctic, and more recently near Dasan Station, Ny-Ålesund, Svalbard in the Arctic. We maintains around 170 strains from Antarctic and Arctic, the preponderance marine diatoms, and we also keep up some chlorophytes, cyanophytes, small flagellates, and freshwater organisms as well. From these collections, we have cultivated in the 2°C culture room with LED lights consisting of three single wavelength red (660nm), green (530nm) and blue (460nm). We have assessed the diversity of psychrophilic polar diatoms cultivated in the KCCPM and attempted to establish phylogenetic relationships among the diverse micro-algae based on light microscopic and electron microscopic observations as well as molecular investigations. An important consequence of our results is the establishment of a database for psychrophilic polar micro-algae based on morphological observations and molecular investigations in the KCCPM. The first arctic cruise using the Korea Ice breaker, ARAON was conducted from 14<sup>th</sup> July to 13<sup>th</sup> August 2010 at Canada Basin, Northwind Ridge and Chukchi Sea. During the cruise, we collected various plankton samples using plankton net (20 µm) for biodiversity and community studies. We will continuously expand our culture collections through the oncoming expeditions using ARAON and the collecting trips from various polar regions.

### Flow diagram of purification steps of unialgal culture



Establishment of a database for psychrophilic polar micro-algae



Tree constructed with Bayesian inference for the SSU alignment (GTR+Γ+I model). (Choi et al. 2008)

## KCCPM

- No. of strains from the Antarctic marine: 82
- No. of strains from the Arctic marine: 69
- No. of strains from the Antarctic freshwater: 39
- No. of strains from the Arctic freshwater: 34
- The KCCPM maintains over 200 strains from the Antarctic and the Arctic. The preponderance is marine phytoplankton but we also have freshwater and cyanophyceae.

## Conclusion

- We have studied the mechanisms of cold adaptation in various psychrophilic polar microalgae. Furthermore, we have screened the physiological characteristics under various temperature gradients for them and analyzed the molecular biological characteristics of these purified genes.
- We are also pending a patent entitled "Microalgae Chlamydomonas strain high-producing lipid isolated from arctic ocean and uses thereof" from Arctic microalga, ArM0029 as a by-product of the project.

## Acknowledgement

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