**Introduction**

- Factors driving speciation are still enigmatic, especially among protists.
- In macrorganisms, geographical barrier was considered as the most important factor.
- On the contrary, microbes are often thought to have unlimited dispersal, therefore speciation would take place in sympathy.

**Goals**

- To infer population structure of *Synura petersenii* using RADseq
- To evaluate importance of geographical and ecological factors shaping the population structure using environmental data and gradient experiments with cultured strains

**Sample map**

**Phylogeny** IQTREE, 85626 positions

- Populations cluster by their geographical origin rather than conductivity.
- Strains from the same regions can prefer different values of conductivity.
- Conductivity was measured at the time of sampling.

**Bioclimatic variables**

- Ancestral state reconstruction of maximal growth rate of cultures in a gradient of temperature.
  - Two groups – first adapted to all temperatures and second adapted to moderate and high.

**Max growth rate - temperature**

**Structure – population structure**

- Similar pattern revealed for both assumed numbers of populations (K).
- Strains were mostly separated into two populations.
- Few strains had mixed origin, which suggests a possible gene flow among them.

**Conclusions**

- There are two major groups within *S. petersenii*
- Group 1 – Czechia and Sweden and group 2 – France, Canada and Norway
- Both groups contain samples with high and low conductivity. Variation partitioning showed that climate and geography are the most important.
- Gradient experiments with cultures revealed that group 1 is adapted to all temperatures, while group 2 is adapted and moderate to high temperatures.

**Methods**

- Organism – *Synura petersenii* (Chrysophyceae, Stramenopiles)
- Sampling, environmental condition measurement – conductivity, pH, temperature
- Culturing in gradient of conductivity and temperature – growth rate
- RADseq
- Phylogeny, Structure and ancestral state reconstruction