Production of microalgal biomass, triacyl glycerols and polyunsaturated fatty acids under simulated north temperate light and temperature conditions

Nielsen, Søren Laurentius

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Production of microalgal biomass, TAGs and PUFAs under simulated North temperate conditions

Søren Laurentius Nielsen & Giovanni del Frari
ENSPAC, Roskilde University,
Roskilde, Denmark

RUC
Roskilde University

Aims:

To test if the production of microalgal biomass is feasible under North temperate conditions
- Low light intensities
- Low temperatures

To quantify
- Growth rates
- Biomass production
- TAG (triacylglycerol) content
- PUFA (poly-unsaturated fatty acids) content

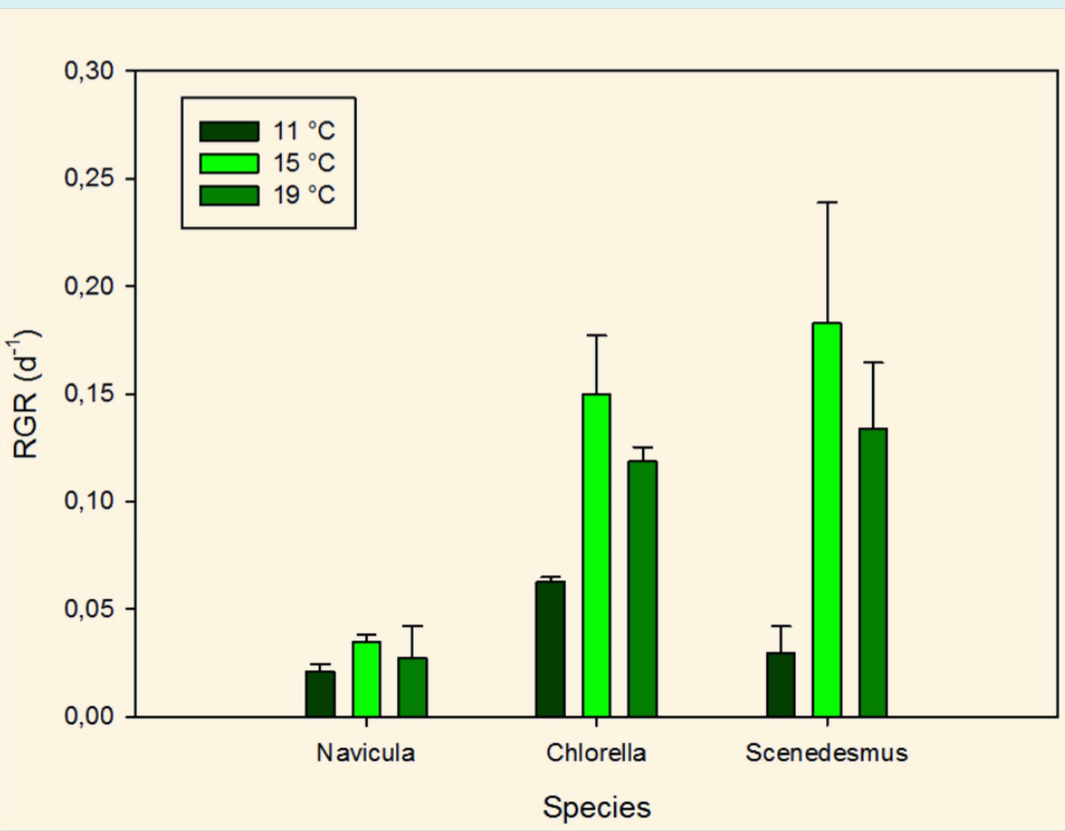
Methodology:

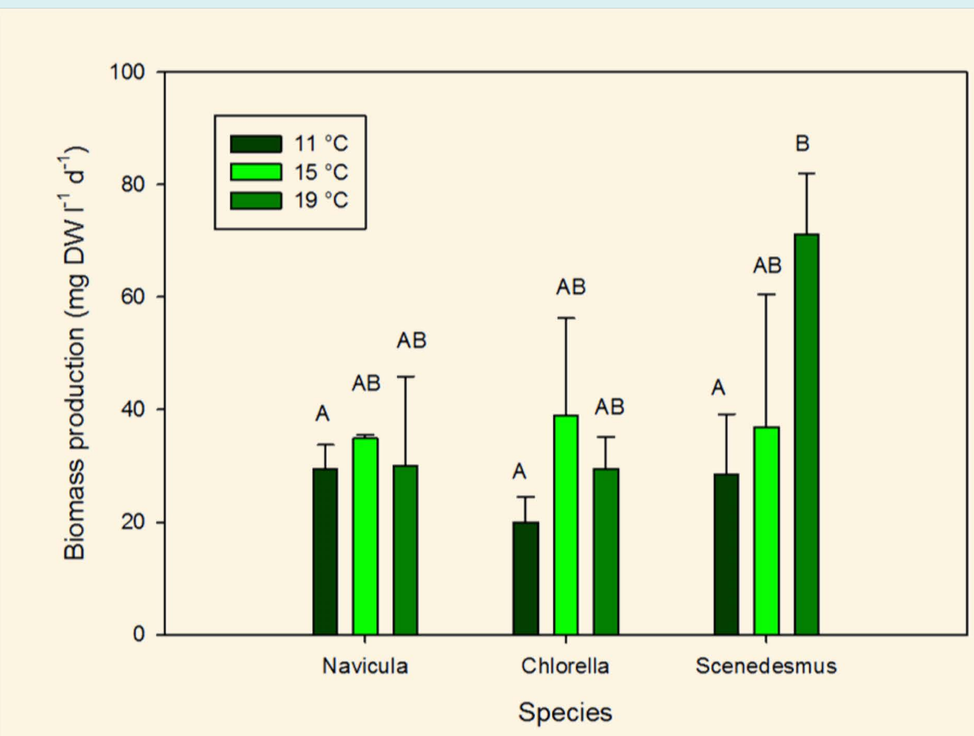
Three species of algae:
- *Navicula pelliculosa* (marine diatom
- *Chlorella vulgaris* (green freshwater algae)
- *Scenedesmus dimorpha* (green freshwater algae)

Three temperatures:
11 °C
15 °C
19 °C

Two light intensities:
- 280 µmol m^{-2} s^{-1}
- 450 µmol m^{-2} s^{-1}

Measured parameters:
Relative growth rate
Biomass production
TAG content
PUFA content





Conclusions:

Microalgal biomass production may be feasible under North temperate conditions, given
- The right species is chosen
- The purpose of the production

Outdoor production is feasible April – October (with diatoms)
Much longer production periods can be achived in even unheated greenhouses

Light will never be a limiting factor for growth. Temperature will determine the potential growth season

The diatom used warrants interest for PUFA production, based on its PUFA profile and high biomass production rate at low temperatures

Chlorella vulgaris is a potential candidate for TAG production, also under these conditions, especially if combined with waster water treatment