

Title:

Cultivation and analytical screening of *Kremastochrysis* sp. (Chrysophyceae) isolated from alpine snow

Authors & affiliations:

Cecilia Nicoletti, Klaus Krennhuber and Daniel Remias
University of Applied Sciences Upper Austria, Wels, Austria

Abstract:

Unicellular photoautotrophic Chrysophyceae (golden algae) are predominantly known for their presence in plankton during spring and autumn. They also occur in long-lasting, melting snowfields in polar and mountainous environments, where they give the snow a yellowish color. Little is known about their adaptations to cold and oligotrophic habitats or about their biotechnological potential.

A species was isolated from a seasonal snowfield in the Austrian Alps, 2000 m above sea level. The strain was preliminarily assigned to the genus *Kremastochrysis*. Cultures were grown in inorganic DY-V medium, aerated, illuminated at 30 to 40 $\mu\text{mol PAR m}^{-2} \text{s}^{-1}$ and exposed either to 1 or 15°C. The cells occurred mainly as heterokont flagellates or, in older batches, as loose aggregates of immotile capsal stage cells. The lyophilised algae were analyzed for fatty acids (GC/MS), pigments and amino acids (LC/DAD+FLD) in order to evaluate the occurrence of valuable metabolites.

It was found that *Kremastochrysis* sp. DR75b accumulated the polyunsaturated fatty acid eicosapentaenoic acid (EPA; C20:5), which has become popular as a substitute for fish oil in vegan diets.

Further steps will include improving growth conditions and the EPA output, as well as a transcriptomic comparison of the two tested temperature levels.