Freshwater lake bacteria isolated from Lake Ekoln and Lake Erken

by modified cultivation techniques

Jiazhao Zhang

Microorganisms play an important role in aquatic ecosystems and food webs. The high diversity of microorganisms may provide enormous potential in biotechnology. Still the majority do not have representative cultured isolates as a result of their complex requirements for growth. Cultivation and resulting pure cultures are very powerful when studying the metabolic features and ecological roles of microorganisms. However, traditional isolation techniques are not suitable for most microorganisms that inhabit nutrient poor environments. Thus many culture-independent molecular analysis tools have been applied over the last decade which have revealed the immense diversity and first insights into the metabolic capabilities and ecological roles of microorganisms in their natural environments. Still, cultures are essential for many methods used in the study of microorganisms.

In this project, a combinative ultrafiltration system was used to prepare media from natural lake water. This technique allows media preparation most closely reflecting the natural environmental conditions. At the same time, initial bacterial concentration was diluted to approximately 1 cell/ml resulting in enrichments and pure cultures.

Several isolates of freshwater lake bacteria were obtained. Most of them belong to abundant and typical groups in the surface water of lakes. This project provides a proof of principle and encourages for future attempts to isolate and culture novel freshwater lake bacteria using the established method.

Degree project in applied biotechnology, Master of Science (2 year), 2012
Examensarbete i tillämpad bioteknologi 30hp till masterexamen, 2012
Biology Education Centre and Department of Ecology and Genetics, Limnology, Uppsala University
Supervisor: Alexander Eiler