

Diversity and Geographical Distribution of *Flavobacterium psychrophilum* Isolates and Their Phages: Patterns of Susceptibility to Phage Infection and Phage Host Range

Castillo, Daniel

Christiansen, Rói Hammershaimb

Espejo, Romilio

Middelboe, Mathias

Flavobacterium psychrophilum is an important fish pathogen worldwide that causes cold water disease (CWD) or rainbow trout fry syndrome (RTFS). Phage therapy has been suggested as an alternative method for the control of this pathogen in aquaculture. However, effective use of bacteriophages in disease control requires detailed knowledge about the diversity and dynamics of host susceptibility to phage infection. For this reason, we examined the genetic diversity of 49 *F. psychrophilum* strains isolated in three different areas (Chile, Denmark, and USA) through direct genome restriction enzyme analysis (DGREA) and their susceptibility to 33 bacteriophages isolated in Chile and Denmark, thus covering large geographical (>12,000 km) and temporal (>60 years) scales of isolation. An additional 40 phage-resistant isolates obtained from culture experiments after exposure to specific phages were examined for changes in phage susceptibility against the 33 phages. The *F. psychrophilum* and phage po