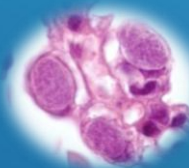
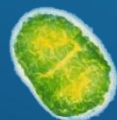


Bactoprofile



What is Bactoprofile

Metabarcoding is a sequencing technology that enables the analysis of the DNA composition of complex biological samples. This technology can be used to identify the presence and composition of specific groups of organisms, such as bacteria or animals. Bactoprofile is a metabarcoding method that focuses on the sequencing of the bacterial 16S gene, a highly conserved marker in bacteria. Bactoprofile provides insights into the relative proportions of bacteria in a sample, offering a snap-picture of the microbial community. This data enables mapping, ongoing monitoring, and direct comparisons between different units at a site, making it an invaluable tool for understanding the microbial community at the facility.

What does the microbial community do

In closed aquaculture systems with high levels of water recycling, the microbial community plays a crucial role in fish health, even more so than in flow-through systems. These closed systems offer greater opportunity to adjust and optimize water parameters for fish growth. However, changes in the water parameters can significantly influence the microbial community. Microorganisms respond quickly to environmental changes, potentially altering the bacterial composition, which can enhance or degrade the environment for the fish. The biofilter is designed to support the presence of nitrifying bacteria that purify the water by converting ammonia and nitrite into the less toxic nitrate through the process of nitrification. This crucial function removes waste products and maintains a stable microbial balance, which is important for fish health and ensures optimal performance in the facility.

How can you use Bactoprofile

Each aquaculture facility will have its own unique bacterial community, which is influenced by factors such as their water source, fish stock, feed, operations, design and geographical location. Bactoprofile provides a tool for monitoring this bacterial composition, which is crucial for maintaining biofilter functionality and water quality. Bactoprofile enables a better understanding of issues in the biofilter or fish health by tracking the changes in the bacterial community over time. Identifying bacterial shifts associated with adverse outcomes, and understanding how these changes occur, makes it possible to prevent recurring problems. Moreover, it allows for evaluation of system adjustments, assessing whether implemented

changes positively affect the bacterial community. In the long term, tools such as Bactoprofile can act as early warning systems, detecting undesirable bacterial profiles or harmful bacteria before they escalate into significant problems, helping ensure a stable and healthy aquaculture environment.

How are the results presented

To ensure that Bactoprofile results are clear and easy to interpret, the data it is presented in two key formats:

1. **The 15 most prevalent bacterial genera:** Time series of the relative abundance of the 15 most prevalent bacterial genera from a fixed bed biofilter. Comparing the same sampling site in the biofilter over time, allows for easy visualization of the changes in the microbial community. Providing insight into potential environmental or operational impacts.
2. **Key bacterial groups:** The relative abundance of bacterial groups of interest, including ammonia-oxidizing bacteria (AOB), nitrite-oxidizing bacteria (NOB), and disease-associated genera, from the same samples shown in Figure 1. This plot highlights key functional and pathogenic bacterial groups, offering insights into biofilter performance and potential health risks.

Figure 1: The 15 most prevalent bacterial genera

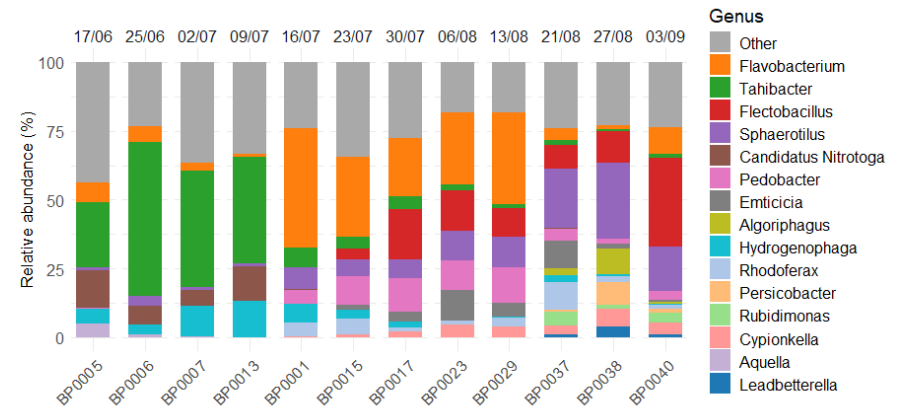
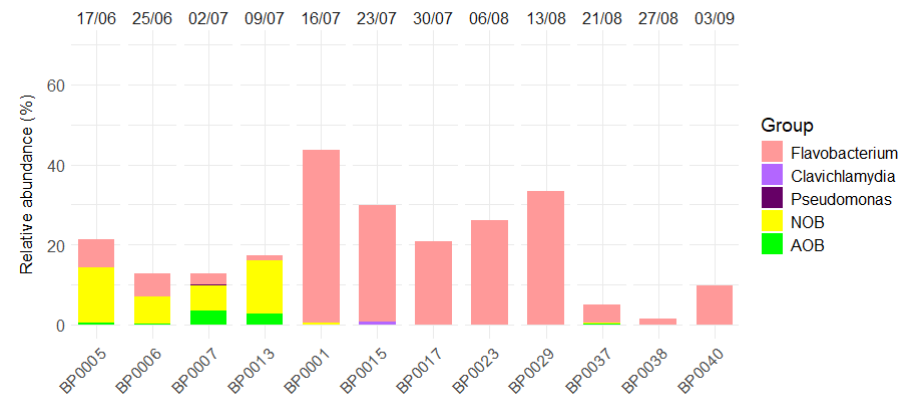


Figure 2: Key bacterial groups



Sample submission

It is important to be consistent with the naming of the same sampling points over time, so that the results easily can be presented in a time series. Sampling forms and sampling guides for this service can be found under “Forms and guides” at our website: <https://patogen.no/>

Possibility for customer projects

If there are wishes to surveil the microbial community outside of the presented format. Customers are encouraged to contact our sales team to discuss this as a potential customer project. For example, surveillance of skin or gills.