Executive Summary

This report provides a concise overview of the various microbiological methods that were considered, tested and developed within the framework of the Techneau project within work area 3. Four different research groups, namely Eawag, TZW, Vermicon and RTU, were involved. Whereas Eawag focused on flow cytometric methods for analyzing the general microbial water quality (entire community), TZW, Vermicon and RTU developed various fluorescent *in situ* hybridisation (FISH) based methods for the specific detection of pathogens and indicator bacteria. Out of a broad range of different methods tested and developed only some selected were finally considered to be suitable for full scale application:

1. For the quantification of the **total cell counts** in water the use of SYBR Green I in combination with flow cytometry (alternatively with epifluorescence microscopy) is recommended.

2. For **total cell counts in biofilms**, the use of nucleic acid dyes in combination with epifluorescence microscopy is possible.

3. For assessing the **total viable cell counts** (membrane integrity) in water samples the use of SYBR Green I / Propidium Iodide (SG/PI) in combination with flow cytometry (alternatively with epifluorescence microscopy), as well as the measurement of both cellular and free ATP (bulk parameter) is recommended.

4. For the **specific detection and quantification of pathogens or indicator organisms** in all kind of waters, the assays Microcolony-DNA-FISH and DVC-PNA-FISH are proposed.

More information

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