Source-specific Detection of Faecal Pollution

Real time PCR | microbial faecal source tracking | water quality analysis

The present invention relates to real time PCR methods for the source-specific detection and quantification of ruminant and human faecal pollution in environmental samples. It is a highly specific, fast and reliable, as well as cost effective method for water quality analysis and quantitative risk assessment.

Background

Faecal pollution of water resources poses health risk to consumers and users all around the world. The investigation of classical faecal indicator parameters (e.g. Escherichia coli, enterococci) as required by regulations are able to detect faecal pollution but provide no information about the contamination source which might be human waste water or non-point sources like grazing livestock or wildlife.

The identification and apportioning of the source of faecal contamination allow improved catchment management and improved protection of water resources (microbial source tracking - MST).

Technology

The new technology is based on the molecular biological detection of faecal genetic markers specific for human and ruminant sources, respectively. The markers are detected by highly sensitive real-time PCR assays with detection limits in the range of nanograms to picograms of fresh faecal material per investigated volume of water. The technique is highly specific for the respective source groups. The method is quantitative allowing comparison and correlation to classical faecal indicator counts or other water quality parameters. It has been tested and applied in numerous studies accross Europe, the US, Asia and Oceania.

Benefits

The method allows specific detection of ruminant and human faecal pollution. It is:

- 100-1000 x more sensitive than E. coli
- highly specific for respective faecal sources
- quantitative, standardized, fast and reliable
- cultivation independent
- inexpensive and cost effective

Potential applications

Environmental diagnostics and microbial faecal source tracking in water quality analysis, water resource management and quantitative risk assessment in the context of Water Safety Plans.

IPR

Patents lapsed

Options

Tests and analyses, R&D co-operations

Inventors

Georg REISCHER, Andreas FARNLEITNER, Robert MACH, David KASPER