Research Center Weihenstephan for Brewing and Food Quality Cechnische Universität München

Real-Time PCR

Detection and Identification of Beer-Spoiling Bacteria with Real-Time PCR

Detection spectrum for (potential) **beer-spoiling bacteria**

L. brevis/L. brevisimilis

- L. lindneri
- L. casei/L. paracasei
- L. buchneri/L. parabuchneri
- L. collinoides
- L. rossiae
- L. backi
- P. damnosus
- P. inopinatus
- P. claussenii
- M. cerevisiae
- * Lactobacillus coryniformis, Lactobacillus plantarum, Lactobacillus paraplantarum, Lactobacillus pentosus, Lactobacillus perolens
- ** Pediococcus parvulus, Pediococcus pentosaceus, Pediococcus acidilactici
- *** Pectinatus cerevisiiphilus, Pectinatus frisingensis, Pectinatus sp.

Table 1: Species of beer-spoiling bacteria (+ potential beer-spoilers) that are detected by the real-time PCR system. In samples contaminated with various microbes (depending on the relative concentrations of each), only the primary contaminating species can be identified reliably. The beer-spoiling species marked with * can only be identified as groups.



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The Weihenstephan Research Center for Brewing and Food Quality offers the detection and identification of beer-spoiling and potentially beer-spoiling bacteria as contract analysis.

This methods also **detects bacteria** that have recently **been described** as *Lactobacillus backi, Lactobacillus rossiae* and *Lactobacillus collinoides.*

Figure 1:

A beer-spoiling *Lactobacillus brevis* strain which produces visible slime (consisting mainly of exopoly-saccharides).

Figure 2:

Overview of a real-time PCR procedure for testing a potentially contaminated sample. The real-time PCR can be combined with a variety of culture media.

Figure 3:

The **real-time PCR cycler** after a completed run.

Figure 4:

Brewery samples are tested for the presence of beer-spoiling bacterial strains. After realtime PCR is completed, a melt curve analysis is performed, enabling the identification of *Lactobacillus backi* and *Lactobacillus brevis*.



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Focus:

- · Weihenstephan medium for the enrichment of beer-spoiling bacteria
- · rapid differentiation of bottom and top fermenting brewing yeasts
- · identification of bacteria and yeast by rDNA sequencing





Fig. 4