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# The DNA Fingerprints of Beer Spoiler No.1 (*L. brevis*) – Tracing & Troubleshooting Tool

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## Introduction:

*Lactobacillus brevis* is the most prevalent beer spoilage bacteria species (figure 1). Figure 2 shows pictures with typical microscopic cell morphologies and typical product changes (turbidity, acidity, viscosity, surface flocs). *L. brevis* is the beer spoiler number one and can cause primary and secondary contaminations. Various strains can occur in a brewery environment with different adaption levels to microbiological relevant beer parameters (pH, alcohol, bitter units, etc.).

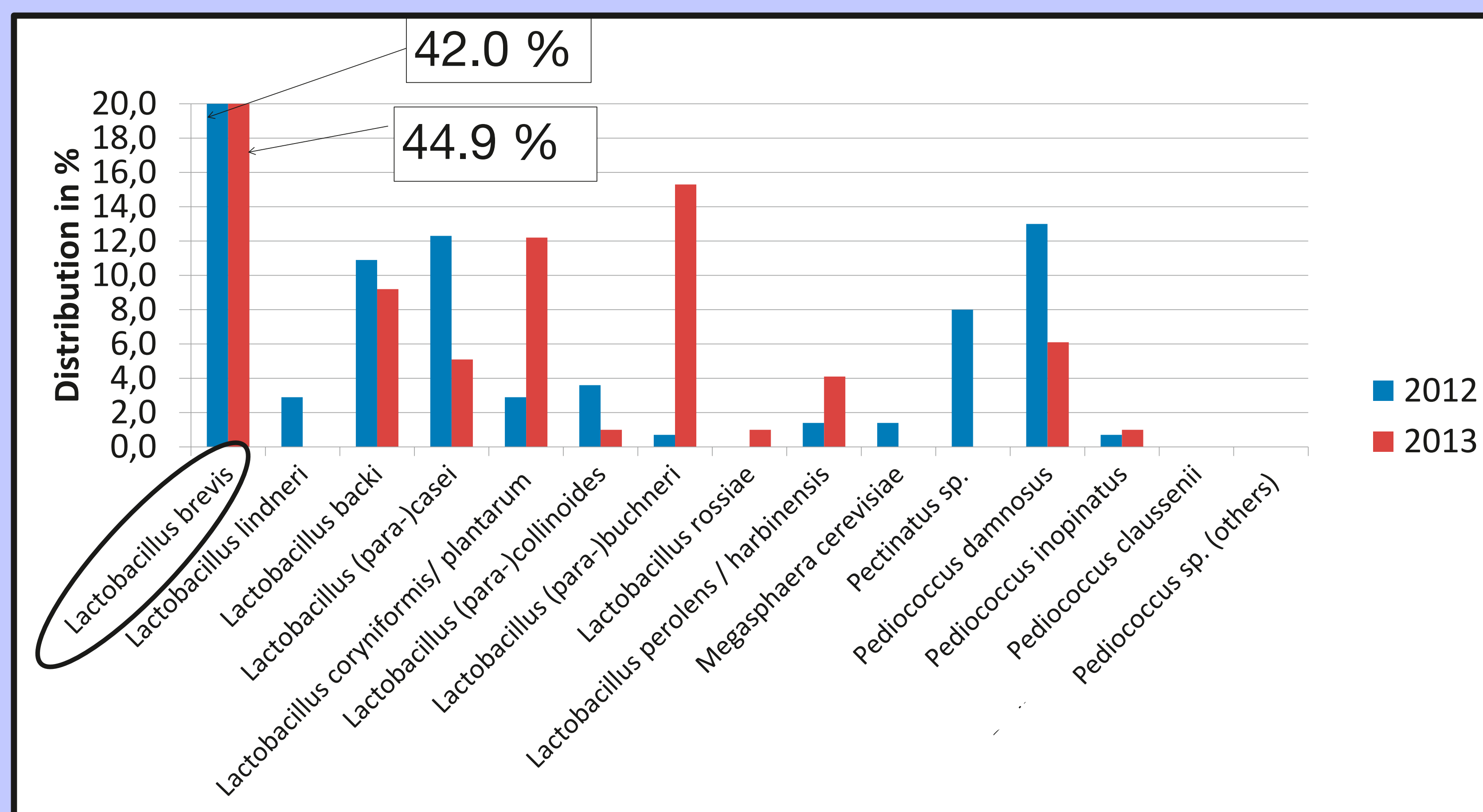


Figure 1: Percentaged distribution of Real-Time PCR identifications of beer spoilage bacteria of the Research Center Weihenstephan in 2012 and 2013

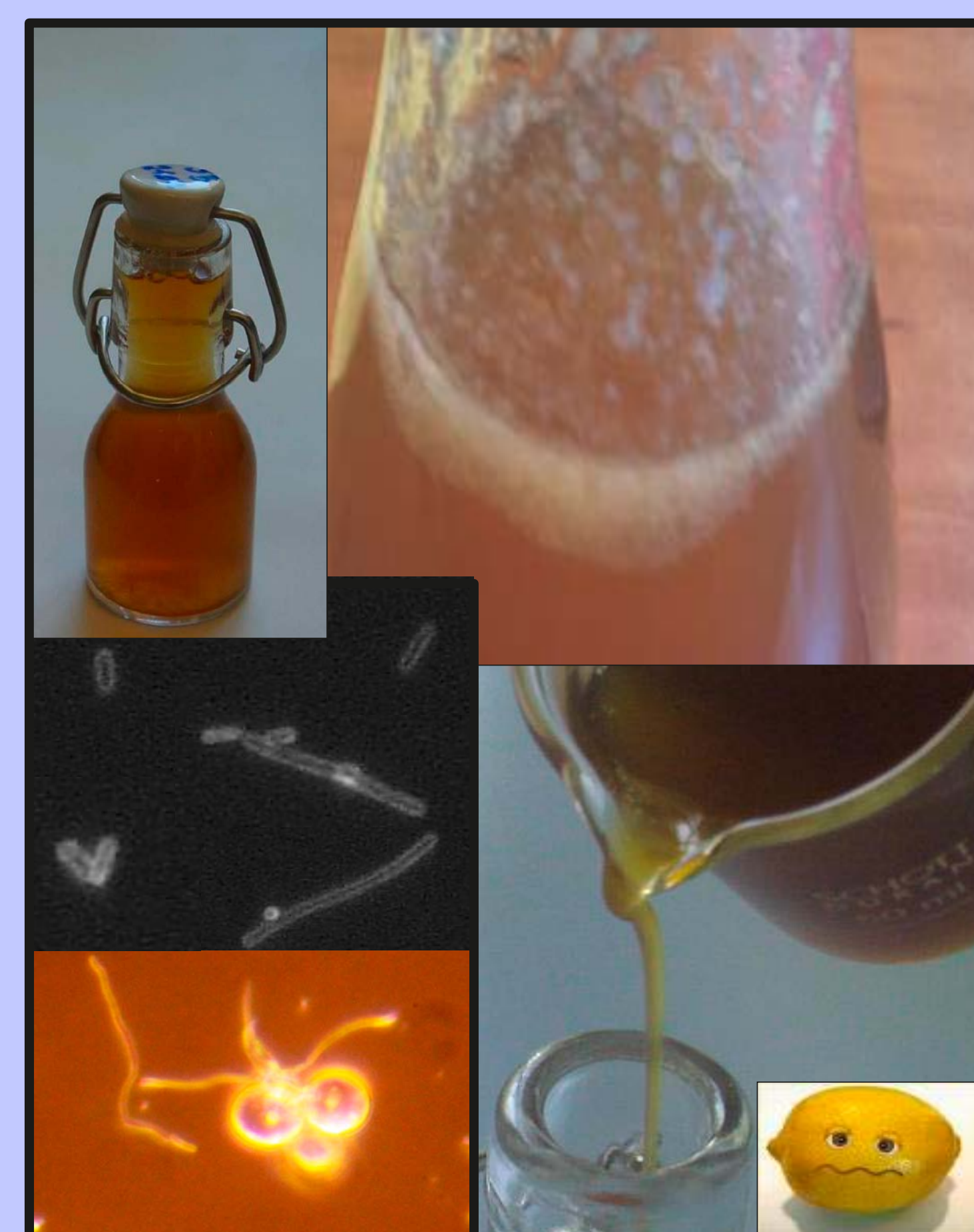
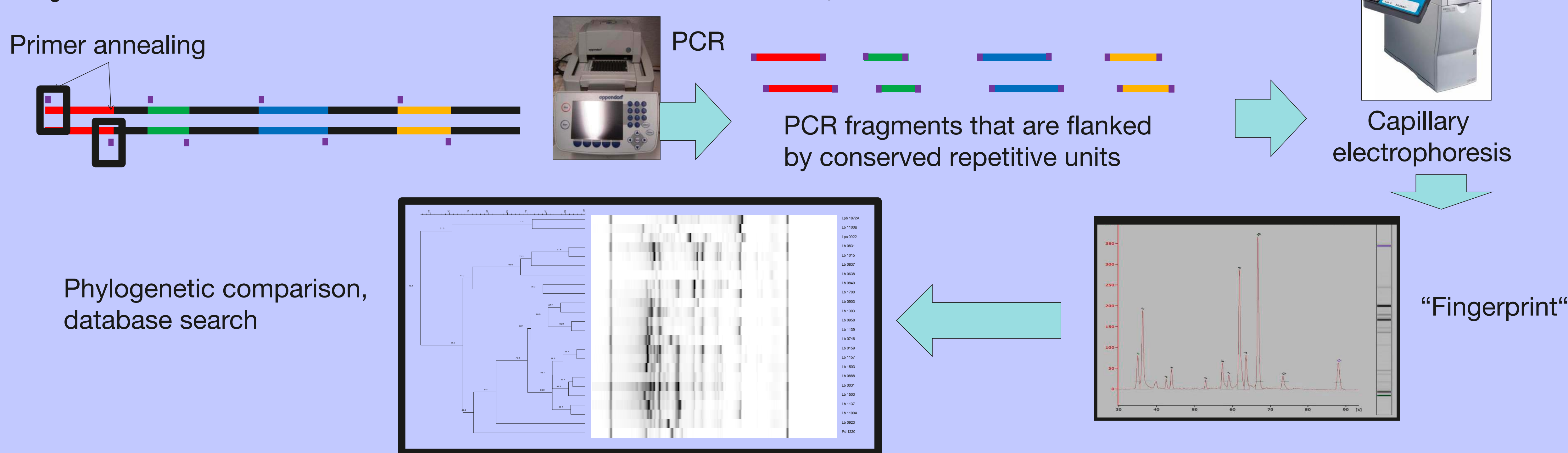


Figure 2: Typical cell morphologies and product changes caused by *L. brevis*

## Method:

(GTG)<sub>5</sub> PCR with subsequent capillary electrophoresis and fingerprint analysis:



## Practical examples and outlook:

Figure 3 shows a contamination tracing of a *L. brevis* strain isolated from a bottle (isolate 12). Figure 4 shows that many different *L. brevis* strains can occur in a brewery environment. The *L. brevis* fingerprint is a reasonable tool to trace *L. brevis* contaminations within a process.

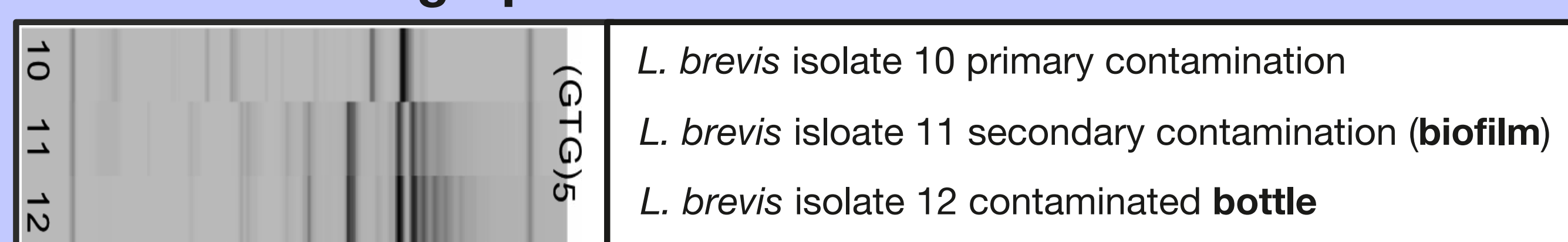


Figure 3: Tracing of *L. brevis* contamination to secondary contamination

The fingerprint tool is also compatible to other lactic acid bacteria (LAB). The fingerprint tool can be applied to various tasks in brewing microbiology.

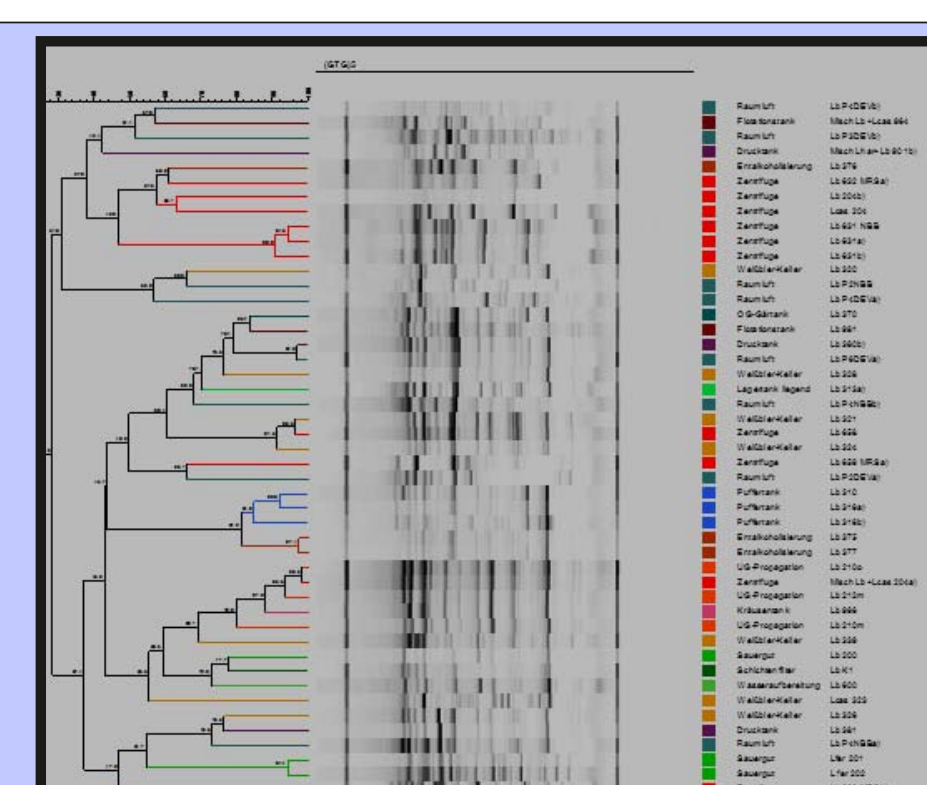


Figure 4: Different *L. brevis* isolates from one brewery

