COMPARISON BETWEEN RAPID ID 32 STREP SYSTEM, MALDI-TOF AND 16S rRNA GENE SEQUENCE ANALYSIS FOR THE SPECIES IDENTIFICATION OF ENTEROCOCCUS SPP. ISOLATED FORM WATER

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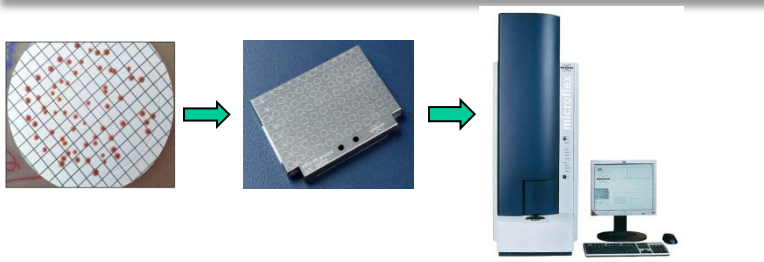
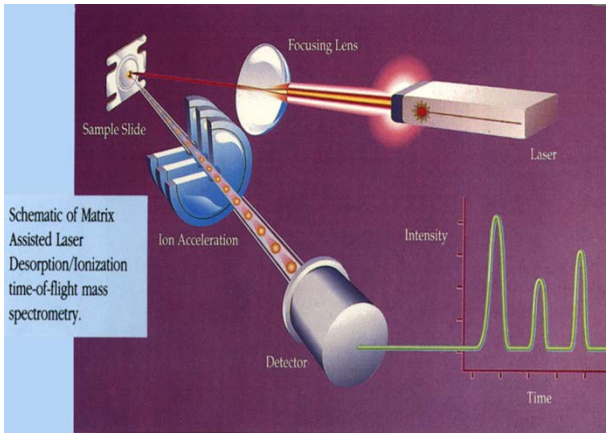
Introduction

Matrix-Assisted Laser Desorption Ionisation–Time of Flight Mass Spectrometry (MALDI–TOF MS) has increasingly been used for rapid and reliable identification of clinically relevant micro-organisms. The aim of this study was to establish the applicability of this technique in (drinking) water quality analysis.

Methods

Bacterial isolates (n=101) were isolated from various types of water and determined as enterococci on the basis of their growth on Slanetz-Bartley agar in typical colonies. The isolates were identified by MALDI–TOF MS and the commercial biochemical test Rapid 32 ID Strep. Isolates yielding discrepant identifications were genotyped using 16S rRNA gene sequence analysis.





Source: Finnigan MAT

Results

Table 1. Comparison between Rapid ID 32 Strep, MALDI-TOF MS and 16S identification for Enterococcus spp.

	No. of isolates	Rapid ID 32 Strep	MALDI-TOF MS	16S rRNA
Agreement	13	*E. faecium*	*E. faecium*	*E. faecium* [1]
	26	*E. faecalis*	*E. faecalis*	*E. faecalis* [1]
	21	*E. hirae*	*E. hirae*	*E. hirae* [1]
	11	*E. durans*	*E. durans*	*E. durans* [1]
	15	*E. casseliflavus*	*E. casseliflavus*	*E. casseliflavus* [1]
	3	no reliable identification [2]	*E. mundtii*	*E. mundtii*
	3	no reliable identification [2]	*E. moraviensis*	*E. moraviensis*
Disagreement	1	*E. faecium*	*E. faecalis*	*E. faecalis*
	6	*E. gallinarum*	*E. faecium*	*E. faecium*
	1	*E. hirae*	*E. durans*	*E. durans*
	1	*E. casseliflavus*	*E. cecorum*/*E. casseliflavus* [3]	*E. casseliflavus*
Total	(n=101)			

1 Not all, but one randomly chosen isolate was identified by 16S rRNA.
2 Species not included in database of Rapid 32 ID test.
3 By repeating the measurement twice, different identifications were obtained: *E. cecorum* and *E. casseliflavus*. Both times the reliability score was ≥2.0.

Conclusions

•MALDI–TOF MS identification (Bruker) is a reliable method for identifying *E. faecium*, *E. faecalis*, *E. durans*, *E. hirae* and *E. casseliflavus* isolated from water samples.

•We obtained high reproducibility of the identification and obtained the same result when using two different culture media.

•MALDI-TOF MS–based fingerprinting of environmental isolates of faecal indicators as shown in this study for environmental isolates of enterococci, has the potential to become a tool for bacterial source tracking (BST). To establish the value of such a tool, a large number of environmental isolates need to be analysed.

•For application of MALDI-TOF for bacterial source tracking it is necessary to include more environmental isolates to the database.