

Comparing MALDI-TOF Mass Spectrometry with Molecular and Biochemical Methods in Identifying *Enterococcus Faecium* and *Enterococcus Faecalis* Isolated from Clinical Samples

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Abstract

Background and Objective: Enterococci are Gram-positive members of human gastrointestinal flora, in Dairy products and environment. They have emerged as important causes of opportunistic nosocomial infections in recent years. In this study we aimed to investigate and compare the efficiency of MALDI-TOF mass spectroscopy method through Biochemical and Molecular methods for detecting *Enterococcus faecalis* and *Enterococcus faecium*.

Materials and Methods: Seventy five clinical samples were collected for biochemical, molecular and mass spectroscopy investigations. Samples were treated with Esculin hydrolysis, Catalase, Pyrrolidonyl aminopeptidase, 6.5% NaCl solution, motility, 0.04% Tellurite, L-Arabinose and Sorbitol. Using specific primer allele specific PCR was used. The samples were then analyzed by MALDI-TOF mass spectroscopy and Biotyper 3 software.

Results: *Enterococcus faecium* and *Enterococcus faecalis* were detected in thirty and forty two samples, respectively whereas three samples showed both bacterial infections. Using biochemical analysis, two *E. faecium* isolates were Arabinose negative and one *E. faecalis* isolate was Tellurite negative. All samples showed correct bands in PCR results but two of them didn't show clear bands (on agarose gel). In mass spectroscopy analysis all strains were correctly detected and well defined.

Conclusion: According to our results, MALDI-TOF mass spectrometry in comparison with Molecular and Biochemical Methods could be a reliable and accurate method that can easily and quickly identify and differentiate *Enterococcus faecium* and *Enterococcus faecalis* in clinical samples.

Key words: *Enterococcus faecalis*, *Enterococcus faecium*, MALDI-TOF mass spectrometry, PCR