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Introduction

Matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) is nowadays a widely applied method for rapid identification of bacteria and yeast in the routine diagnostic laboratory.

Aim of the study

The aim of this study was to evaluate the performance of MALDI-TOF MS for identification of microorganisms grown on chromogenic media.

Materials and Methods

Bacteria ($n=320$) and *Candida* isolates ($n=66$) collected at five laboratories were cultured non-selective standard media (blood or Sabouraud dextrose agar) and six types of chromogenic agar medium (CHROMagar).

Colonies from both types of media were identified by MALDI-TOF MS, using an on-plate extraction protocol. A set of reference strains ($n=11$) were included to analyze the effect of extraction.

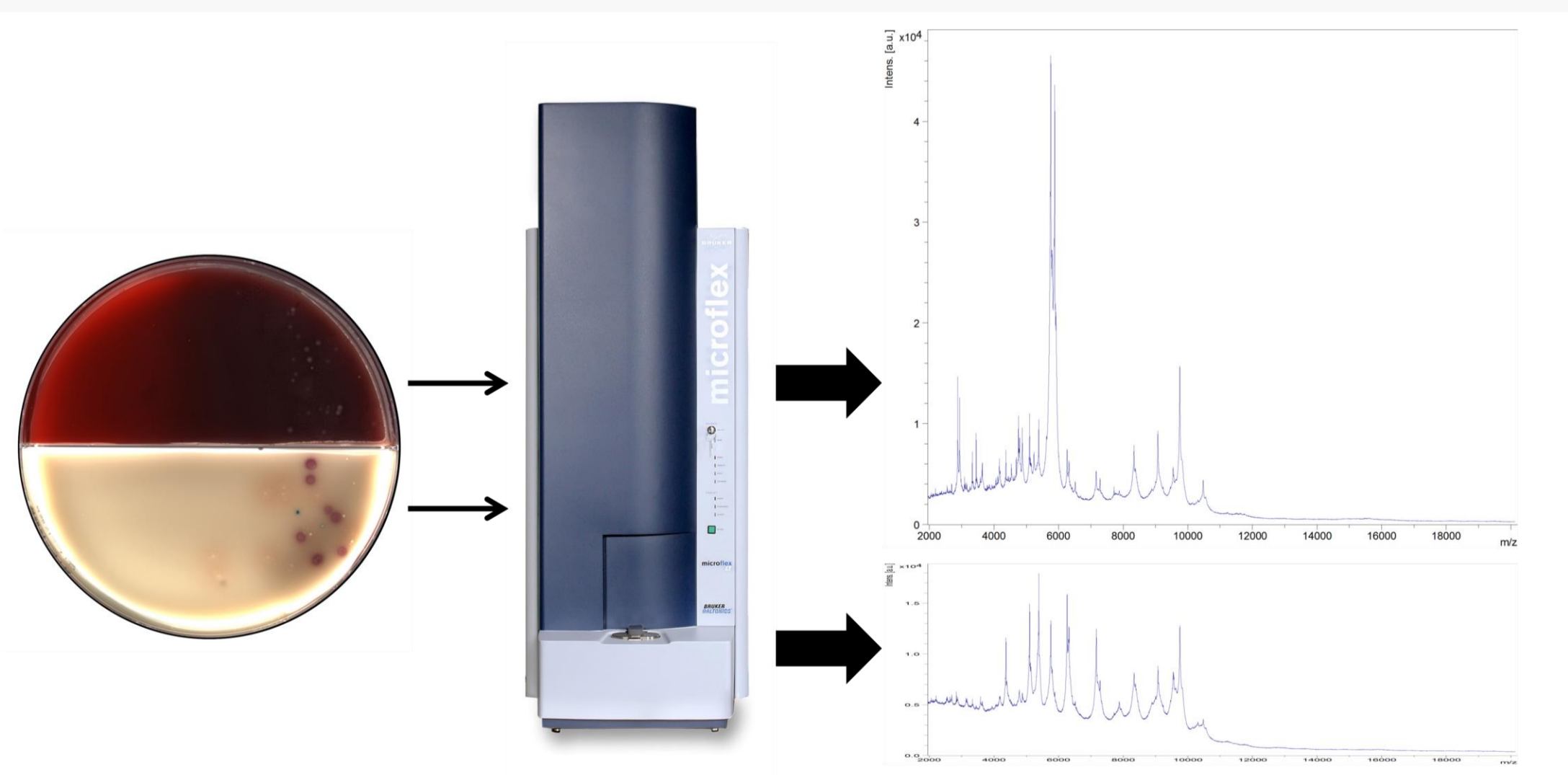


Figure 1. Study design. A total of 386 clinical isolates were cultured on different types of agar media in parallel and identified by MALDI-TOF MS.

Conclusion

Microorganisms can be investigated directly from chromogenic media by MALDI-TOF MS without impact on the diagnostic performance.

Results 1

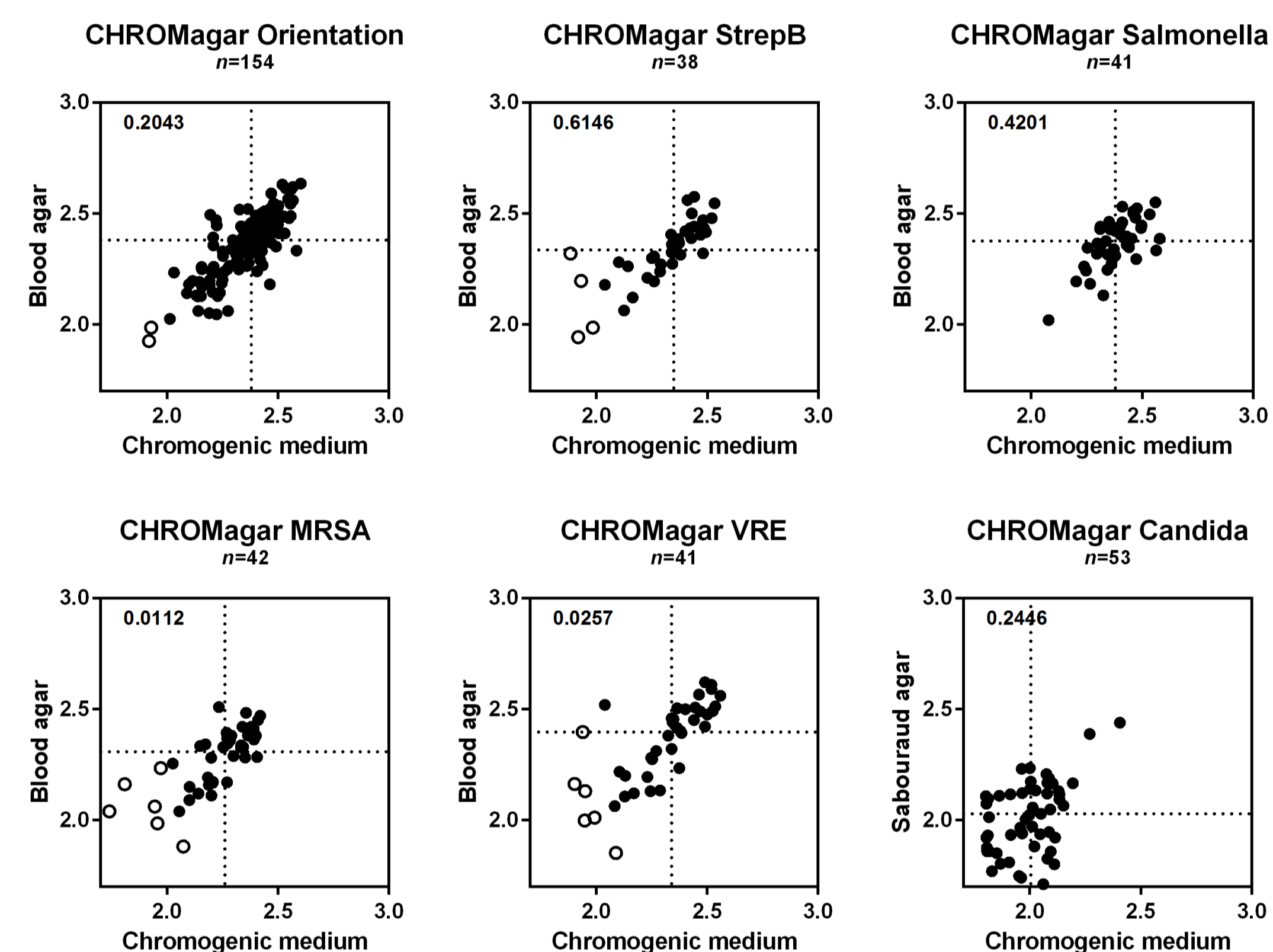


Figure 2. Performance of MALDI-TOF MS for microbial identification from different culture media. Individual results are depicted, empty circles indicate score values < 2.0 , the dotted lines indicate median score values. Comparison by Wilcoxon matched-pairs signed rank test (P -values, upper left corner in each blot).

Culture on chromogenic media

- did not induce misidentifications by MALDI-TOF MS,
- did not reduce the number of reliable species identifications for bacteria (log score ≥ 2.0) or yeast (log score ≥ 1.7),
- resulted in slightly lower log scores for the identification results ($P < 0.05$).

Results 2

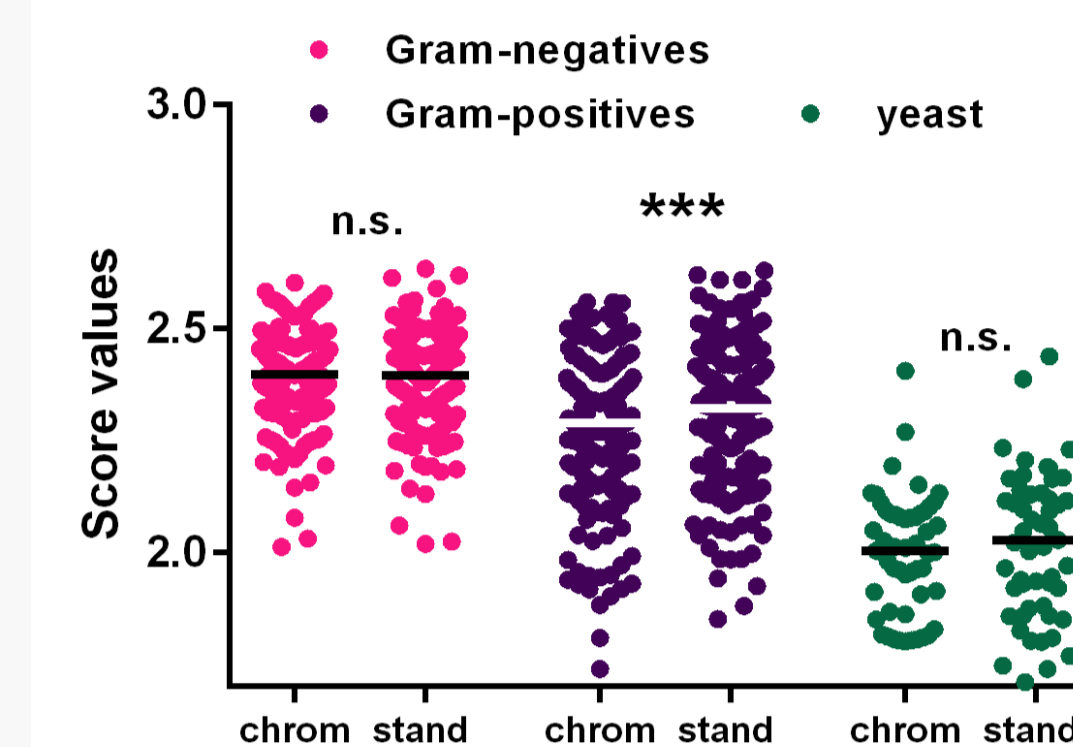


Figure 3. Influence of microorganisms on MALDI-TOF MS performance. Bacteria were grouped according to Gram stain; no difference was seen for Gram-negative species ($n=156$) and *Candida* yeast ($n=53$; 13 isolates with scores < 1.7 excluded), but slightly higher score values were obtained for Gram-positive species ($n=164$) when grown on standard (stand) compared to chromogenic (chrom) agar media.

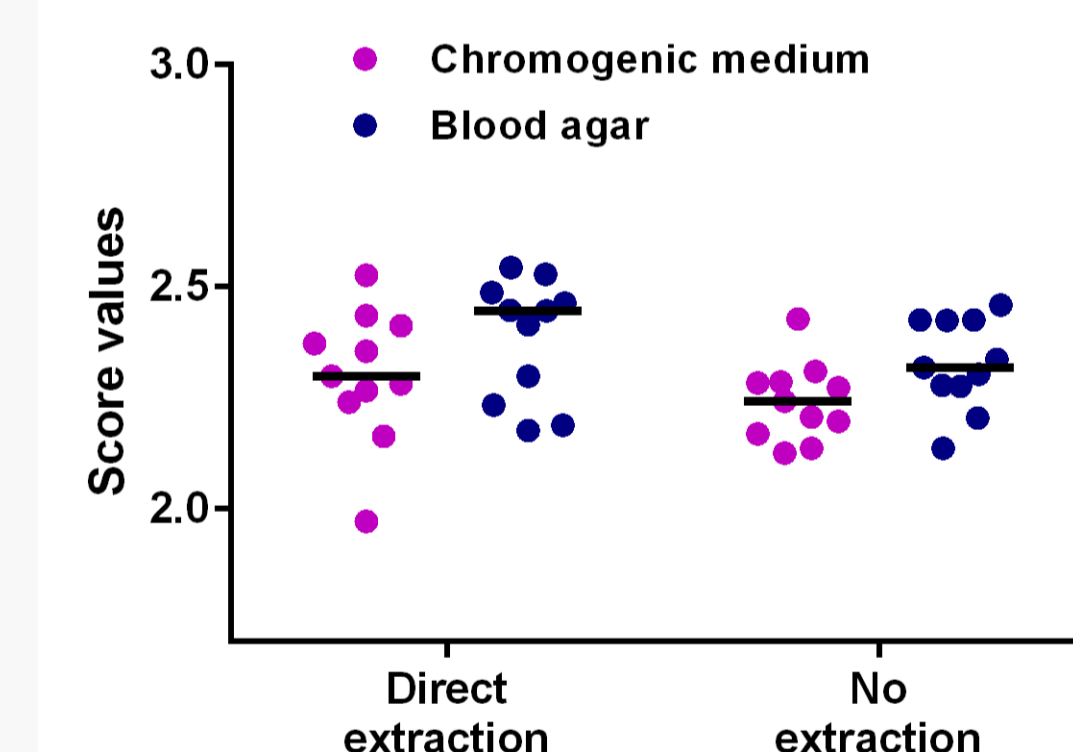


Figure 4. Influence of extraction on MALDI-TOF MS performance. Reference strains ($n=11$) were grown on blood and chromogenic agar media and were identified by MALDI-TOF MS after on-plate (direct) extraction or without (no) extraction.

Acknowledgements

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Reference

Lüthje P *et al.* (2017) Identification of microorganisms grown on chromogenic media by MALDI-TOF MS. *J Microbiol Methods*.