

## Comparison of automatic methods MALDI-TOF, VITEK2 and manual methods for the identification of intestinal microbial communities on the example of samples from alpacas (*Vicugna pacos*)

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Received: March 23, 2023

Accepted: August 22, 2023

### Abstract

**Introduction:** Universally, in microbiological diagnostics the detection of live bacteria is essential. Rapid identification of pathogens enables appropriate remedial measures to be taken. The identification of many bacteria simultaneously facilitates the determination of the characteristics of the accompanying microbiota and/or the microbiological complexity of a given environment. **Material and Methods:** The effectiveness of the VITEK2 Compact automated microbial identification system and matrix-assisted laser desorption/ionization–time-of-flight mass spectrometry (MALDI-TOF MS), analytical profile index (API) and Remel Rapid tests were compared in identification of bacteria isolated from the alpaca gastrointestinal tract. **Results:** Most isolates were Gram-positive, such as *Bacillus cereus*, *Bacillus flexus*, *Bacillus licheniformis*, *Bacillus pasteurii* and *Bacillus subtilis*; *Enterococcus faecium*, *Enterococcus gallinarum*, *Enterococcus hirae* and *Enterococcus casseliflavus*; *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus lentus*, *Staphylococcus parvalintermedius* and *Staphylococcus sciuri*; *Paenibacillus amylolyticus*; *Cellulosimicrobium cellulans*; *Leuconostoc mesenteroides*; *Clostridium perfringens*; *Corynebacterium jeikeium*, *Corynebacterium jeikeium*, and *Corynebacterium diphtheriae* (the last only isolated manually by API Coryne and the VITEK2 system and *Corynebacterium* (CBC) card). *Corynebacterium diphtheriae* was misidentified by MALDI-TOF MS as *Candida lipolytica* (currently *Yarrowia lipolytica*). Gram-positive and Gram-variable *Micrococcus luteus* were also isolated. Gram-negative *Enterobacter cloacae*, *Enterobacter gergoviae*, *Enterobacter hormaechei* and *Enterobacter ludwigii*; *E. coli*; *Klebsiella pneumoniae* subsp. *pneumoniae*; *Citrobacter brasili* and *Citrobacter freundii*; *Serratia liquefaciens*, *Serratia odovvero* and *Serratia marcescens*; *Morganella morganii* subsp. *morganii*; *Providencia alcalifaciens*; *Paraburkholderia anthonomus*; *Streptophomonas molyphila*; *Moraxella osloensis*; and *Ochrobactrum intermedium* were also found. The yeasts *Candida albicans*, *Candida lusitanae* and *Candida zeyheri* were also present. **Conclusion:** MALDI-TOF MS enabled the identification of pathogens and opportunistic pathogens from the alpaca gut which may represent a high risk to human and animal health.

**Keywords:** MALDI-TOF MS, *Vicugna pacos*, intestinal microbiota, opportunistic pathogens, microbial identification.

# Manual Methods For Microorganism Identification

**Mark Steyvers**



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