

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*)

Joanna Pławińska-Czarnak^{1,2}, Karolina Wódz², Zuzanna Strzałkowska¹,
Monika Żychska³, Tomasz Nowak², Adam Kwieciński², Piotr Kwieciński²,
Wojciech Bielecki⁴, Anna Rodo⁴, Magdalena Rzewuska⁵, Daria Kłosińska⁶,
Krzysztof Anusz¹, Blanka Orłowska¹

¹Department of Food Hygiene and Public Health Protection, ²Department of Pathology and Veterinary Diagnostics, Institute of Veterinary Medicine, Warsaw University of Life Sciences, 02-776 Warsaw, Poland

³Laboratory of Molecular Biology, Vet-Lab Brudzew, 62-720 Brudzew, Poland

⁴Laboratory of Veterinary Epidemiology and Economics, Institute of Veterinary Medicine, Warsaw University of Life Sciences, 02-786 Warsaw, Poland

⁵Department of Preclinical Sciences, Institute of Veterinary Medicine,

Warsaw University of Life Sciences, 02-787 Warsaw, Poland

⁶Division of Histology and Embryology, Department of Morphological Sciences, Faculty of Veterinary Medicine, Warsaw University of Life Sciences, 02-776 Warsaw, Poland
joanna.plawinska_czarnak@sggw.edu.pl

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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 equorum*, *Staphylococcus lentus*, *Staphylococcus parvialtermedius* and *Staphylococcus sciuri*; *Paenibacillus amylolyticus*; *Cellulosimicrobium cellulans*; *Leuconostoc mesenteroides*; *Clostridium perfringens*; *Corynebacterium stationis*, *Corynebacterium jeikeium*, and *Corynebacterium diphtheriae* (the last only isolated manually by API Coryne and the VITEK2 system and *Corynebacteria* (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 braakii* and *Citrobacter freundii*; *Serratia liquefaciens*, *Serratia odorifera* and *Serratia marcescens*; *Morganella morganii* subsp. *morganii*; *Providencia alcalifaciens*; *Paraburkholderia pseudomallei*; *Stenotrophomonas maltophilia*; *Moraxella osloensis*; and *Ochrobactrum intermedium* were also found. The yeasts *Candida albicans*, *Candida lusitanae* and *Candida kefyr* 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

Samuel Tertius Cowan



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Cowan and Steel's Manual for the Identification of Medical Bacteria Samuel Tertius Cowan,1993 A practical manual of the key characteristics of the bacteria likely to be encountered in microbiology laboratories and in medical and veterinary practice

Sustainable Analytical Techniques in Food Science Bárbara Socas Rodríguez,Antonio V. Herrera Herrar,Alicia Gil Ramírez,Mauricio A. Rostagno,2024-11-07 Sustainable Analytical Techniques in Food Science covers the most relevant developments for the analytical evaluation and analysis of macro and micronutrients contaminants and microbiological studies as well as the approaches in food authentication and characterization With a focus on sustainability this book provides a practical guide for researchers to adopt greener approaches for the study of food matrices including toxicity safety and quality evaluations It is an excellent guide for researchers working in the area of food sciences that want to assure the sustainability of the methodologies they are currently developing or applying in their laboratories Offers sustainable food analysis techniques for researchers to apply in their laboratories Adopts an analytical approach to address the essential developments in food science and processing Addresses future perspective in sustainable food analysis techniques

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