

TITLE: CHALLENGES IN IDENTIFYING *ACINETOBACTER CALCOACETICUS* - *ACINETOBACTER BAUMANNII* COMPLEX IN VETERINARY MICROBIOLOGY LABORATORIES

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ABSTRACT:

Acinetobacter calcoaceticus - *Acinetobacter baumannii* (Acb) complex comprises five similar species with potential for multidrug resistance. The World Health Organization listed *Acinetobacter baumannii* carbapenem-resistant as a level 1 priority pathogen. Acb is an emerging concern in human health, and it is an increasing challenge in veterinary medicine since little is known about its natural occurrence in animals and its potential zoonotic concern. In both human and veterinary diagnostic laboratories, fast and reliable identification of *Acinetobacter* species is very challenging. This study aimed to compare proteomic (MALDI-TOF), molecular methods (multiplex PCRs) and the gold standard technique (*rpoB* gene sequencing) at identifying Acb complex. A total of 10 Gram-negative isolates from clinical animal samples were investigated, including samples from urinary tract infections, otitis, pyodermatitis, and pododermatitis. MALDI-TOF identified the isolates as *Acinetobacter pittii* (60%, 6/10), *Acinetobacter baumannii* (30%, 3/10), and *Acinetobacter nosocomialis* (10%, 1/10). The following multiplex PCRs were used to further identify these species: *recA* (*Acinetobacter* spp.), *gyrB* (*A. baumannii* and *A. nosocomialis*), ITS region (*A. baumannii*) and ITS region (*A. pittii*). Sequencing of the *rpoB* gene, which is the gold standard method, presented 100% of agreement with the proteomic and multiplex PCR methods. Considering that *rpoB* gene sequencing is a laborious and an expensive technique, the present results suggest that MALDI-TOF or multiplex PCR have the potential to provide as accurate species identification as the gold standard method. Here we highlight that MALDI-TOF or multiplex PCR are fast and affordable tools representing an alternative option for characterization of Acb complex species from clinical samples.

Keywords: RpoB gene, routine veterinary diagnostics, species identification

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