

COMPARISON OF MALDI-TOF WITH GENE SEQUENCING IN BACTERIA ISOLATES FROM PLANTS BELONGING TO FAMILY RHIZOBIACEAE

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Bacterial taxonomy is a systematic classification of microorganisms based on their quantifiable properties. In bacterial classification, macroscopic and microscopic properties were initially used to subdivide organisms into related groups, followed by metabolic and antigenic properties and more recently by genomic relationships. The sequencing of individual genes or the entire genome, offers a definitive classification in most of the bacteria. Although any scheme used to classify organisms is based on rules that define arbitrary divisions and a hierarchy of relationships (e.g., genus, species, subtype), genome analysis is currently accepted as the prevailing standard. Thus, any new technique used to classify organisms must be compared with a genomic classification. Bacterial identification with MALDI-TOF MS compares favorably with both biochemical and genomic identification methods in several groups of clinical microorganism. In this work, we have evaluated the suitability of MALDI-TOF MS for differentiation of species belonging to Family Rhizobiaceae that actually contains three genera (*Rhizobium*, *Ensifer* and *Shinella*) whose identification is not possible on the basis of physiological or biochemical classical traits. For this purpose, we analyzed the type strains of the species belonging to these genera as well as the strains previously identified by *rrs* and/or housekeeping gene sequencing isolated from different sources. Moreover, we analyzed strains from the same or different species carrying different types of symbiotic or virulence plasmids that could affect MALDI-TOF analysis.

The results obtained with MALDI-TOF MS are in complete agreement with those based on gene sequencing, showing that MALDI-TOF MS is an excellent tool for identification of species from Family *Rhizobiaceae* without ambiguous results in the 100% of the strains analyzed in this work. Therefore, this study demonstrates the potential of MALDI-TOF MS for taxonomic classification of bacteria belonging to the Family *Rhizobiaceae*.