Introduction

Polyphasic taxonomy is aiming at the integration of different kinds of data (i.e. phenotypic, genotypic and phylogenetic) on microorganisms and essentially indicates a consensus type of taxonomy (1,2). In this work multivariate data analysis was used as a tool for determining the taxonomy of thirteen solventogenic strains of Clostridium isolated from Colombian soils (3). This strategy was selected due to its ability for establishing relationships between individuals (strains) based on its characteristics (variables).

Materials and methods

1. Thirteen Colombian clostridia strains and ten reference strains were characterized by phenotyping (3) and genotyping techniques (4):
   - Biochemical tests *
   - Solvent production **
   - Cellulolytic activity **
   - 16S rRNA sequencing
   - PFGE macro restriction profiles *
   - AFLPs *
   - DNA-DNA hybridization **

   (*categorical data, ** numerical)

2. The data so obtained was then grouped into different sets according to the kind of variable (i.e. categorical or continuous).
3. Multiple correspondence analysis (MCA) was used for categorical variables whereas principal component analysis (PCA) was used for numerical variables, by using SPAD 5.6.2 software (Decisia, France).
4. Each analysis was followed by a hierarchical clustering analysis for visualizing the strains on a tree.
5. Multiple factor analysis (MFA) provided factorial coordinates; hierarchical cluster analysis was then applied to the combined set of data.

The results revealed a 10-native-strain-cluster clearly separated from reference strains in all types of analysis. This criterion was used to include reference strains in multivariate data analysis

Conclusions

1. It was determined that 10 of the native strains (IBUN 125C, IBUN 158B, IBUN 137K, IBUN 64A, IBUN 18Q, IBUN 18A, IBUN 18S, IBUN 95B, IBUN 125C, IBUN 64A) are separately clustered from reference strains included in this study. IBUN 22A and IBUN 140B were shown to be closely related to C. butyricum.

Literature cited


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For further information:

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