

Microbial community diversity in the soil of Barrientos Island estimated by RAPD and Biolog Ecoplate methods

ABSTRACT

The diversity of soil microbial communities at Barrientos Island with different soil characteristics were evaluated using PCR-based method random amplified polymorphic DNA (RAPD) and community level physiological profiles (CLPP) of Biolog Ecoplate. The soils were selected from 17 different locations around Barrientos Island inhabited by different breeders. Shannon-Weaver index and multivariate analysis were performed to characterize variations of soil microbial communities. Both RAPD and CLPP methods exhibited that most soils with different type of rookery and characteristics could possibly affect the DNA sequence diversity and soil microbial diversity. The abandoned type of rookery had the highest Shannon-Weaver index as exhibited by soil sample 445 (3.4 for RAPD) and 450 (3.09 for CLPP). Higher coefficients of DNA sequence similarity were found in soil samples colonized by similar breeders, like soil 442 and 446 (both were active Chinstrap rookery) shared highest similarity in DNA sequences (73.53). The cluster analysis of RAPD profiles by UPGMA and principle component analysis (PCA) of Biolog Ecoplate exhibited similar influence of type of rookery and soil condition towards soil microbial community diversity. The results may suggest that the change in microbial community DNA composition is accompanied with the change in microbial functional properties.

Keyword: Microbial; Diversity; Random amplified polymorphic DNA (RAPD); Biolog; Soil; Barrientos Island
