ABSTRACT

Since soil-borne bacteria represent the world's greatest source of biological diversity, the diversity of culturable bacteria associated with soil from three different regions of the Anchorage Island on the Antarctic Peninsula was investigated. Soil samples analysed included Sandy coarse soil (AI_1), Black & fine soil (AI_2) and High nutrient (AI_3).

A total of 196 bacteria were isolated under aerobic conditions at 4°C using Nutrient agar as medium. The isolates were grouped using morphology and amplified rRNA gene restriction analysis fingerprinting and identified by partial sequencing of 16S rRNA gene. Out of 14 different RFLP patterns and different morphologies that were sequenced, bacterial isolates fell in four phylogenetic groups: Actinobacteria, Bacteroidetes, subclasses α, ß, and γ-Proteobacteria and Deinococcus.

Actinobacteria phylum contained *Arthrobacter, Rhodococcus* and *Agreia* was dominated in all samples (57%) especially in AI_2 with more than 90%. *Flavobacterium, Sejongia* and *Chryseobacterium* from Bacteroidetes were dominant after Actinobacteria with 20.3%. Proteobacteria phylum contains *Sphingomonas, Polaromonas, Naxibacter, Janthinobacterium, Peseudomonas and Psychrobacter* with 15.1% was third phylum that isolated among all samples. While α-Proteobacteria were isolated from AI_2 and AI_3 samples, whereas ß Proteobacteria and γ- Proteobacteria were found in AI_1 and AI_3 samples. Deinococcus phylum with 7.6% was isolated in AI_3 sample.

Totally based on phylogenetic trees, at least 24 different genera were identified. Dependent upon sequence analysis (<96% sequence similarity), the Anchorage Island isolates belonged to at least 13 different bacterial families. These results indicated a high culturable diversity within the bacterial community of the Anchorage Island soil samples.

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ABBREVIATIONS

%	: percent
>	: more than
<	: less than
°C	: degree Celsius
µl	: microlitre
AI	: Anchorage Island
BLAST	: basic local aligned search tool
BSA	: bovine serum albumin
bp	: base pairs
CFU	: Colony Forming Unit
DNA	: deoxyribonucleic acid
dNTP	: deoxyribonucleoside triphosphate
dH_2O	: distilled water
EtBr	: ethidium bromide
g	: gram
G/C	: guanine/cytosine
L	: liter
M	: molar
m	: meter
MEGA	: molecular evolutionar genetics analysis
min	: minute
mM	: millimolar
ml	: milliliter
mg	: milligram
nm	: nanometer
pM	: picomolar
$MgCl_2$	: Magnesium chloride
NEB	: New England Biolab
OD	: optimal density
PCR	: polymerase chain reaction
rDNA	: ribosomal deoxyribonucleic acid
RNA	: ribonucleic acid
rRNA	: ribosomal ribonucleic acid

rpm : revolutions per minute

RFLP : Restriction Fragment Length Polymorphism

S : south

sdH_2O : sterile distilled water

SSU : small subunit

TAE : tris acetate ethylenediaminetetraacetate acid

Taq : *Thermus aquaticus*

UV : ultraviolet

uni-for : universal forward

uni-rev : universal reverse

V : volt

W : west

w/v : weight per volume

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