Multiple-antibiotic-resistant bacteria from the maritime Antarctic

Abstract

The existence of multiple-antibiotic-resistant strains of environmental bacteria is commonly linked to human activities. However, multiple-antibiotic-resistant strains of bacteria are also widely found in the Antarctic that has limited human activity. This study was conducted to examine the prevalence of antibiotic-resistant strains among Antarctic bacteria. Forty-five bacterial strains from Estrellas lake of King George Island and Crater lake of Deception Island, Antarctic, were exposed to 30 different antibiotics. Forty out of the 45 bacterial strains were affiliated to 12 genera, Aeromicrobium, Arthrobacter, Bacillus, Brevundimonas, Cryobacterium, Dyadobacter, Flavobacterium, Methylibium, Pedobacter, Pseudomonas, Rhodococcus, and Sphingomonas. Among the bacteria, 43 strains were resistant to at least three antibiotics, and 26 strains were resistant to 10 or more different antibiotics. Pseudomonas spp. and four unknown Microbacteriaceae bacteria were found to be resistant to majority of the antibiotics tested. Two bacteria, each from Estrellas and Crater lakes, were sensitive to all the antibiotics tested. These results indicated that Antarctic bacteria are probably the reservoirs for antibiotic resistance genes.