Heterotrophic bacterial populations in the mineral waters of thermal springs in Spain.
Mosso MA; de la Rosa MC; Vivar C; Medina MR


AB  - The microbiological quality and heterotrophic bacterial populations of 26 thermal mineral water springs in Spain were studied. In most of the springs the number of viable aerobes was less than 10(3) cfu ml-1 and the number of sporulated bacteria less than 10(2) cfu ml-1. No significant differences were found in the counts obtained with Plate Count Agar (PCA) and PCA diluted 1:10 and incubated at 22 degrees, 37 degrees and 45 degrees C. Total coliforms were found in 14 springs, faecal streptococci in three, spores of sulphite-reducing Clostridium and Pseudomonas aeruginosa in seven. Neither Escherichia coli nor Staphylococcus aureus were found. A total of 665 strains were isolated and 85.4% of these identified; 329 were Gram-positive and 239 were Gram-negative. The genera most prevalent present in the springs were Pseudomonas (in 92.3%), Bacillus (65.4%), Enterobacter, Micrococcus and Staphylococcus (50%), Acinetobacter (42.3%), Arthrobacter (38.4%), Clostridium (27%) and Xanthomonas (23%). Gram-negative bacteria predominated in the mesothermal springs and Gram-positive bacteria in the hyper- and hypothermal springs. The most common Gram-negative rod species isolated were Ps. fluorescens, Ps. aeruginosa, Ps. putida, Ent. agglomerans, Ent. sakazakii, Ac. calcoaceticus and Ent. amnigenus.

LA  - English