ENVIRONMENTAL MYCOBACTERIA IN DRINKING WATER BEFORE AND AFTER REPLACEMENT OF THE WATER DISTRIBUTION NETWORK

A. TSINTZOU, A. VANTARAKIS, O. PAGONOPOULOU, A. ATHANASSIADOU[1] and M. PAPAPETROPOULOU*

Environmental Microbiology and [1] Laboratory of General Biology, Medical School, University of Patras, Patras 26500, Greece

(author for correspondence, e-mail: papapet@hol.gr)*

(Received 15 October 1998; accepted 29 June 1999)

Abstract. Environmental mycobacteria (*M. chelonae* (8), *M. flavescens* (6), *M. gordonae* (6), *M. fortuitum* (5), *M. kansasii* (4), *M. phlei* (2) and *M. terrae* (2)) were isolated from 21.3% of drinking water samples before replacement of the distribution network of Patras. After replacement of the network only 1.8% of the samples contained environmental mycobacteria (*M. chelonae* (2)). The identification of environmental mycobacteria was performed by Restriction Enzyme Analysis-Polymerase Chain Reaction. Our results showed no statistically significant correlation between the presence of mycobacteria and the bacteriological fecal indicators ($p > 0.05$). Moreover, we determined that concentrations of free residual chlorine equal to or greater than 0.5 mg L^{-1} in the water supply network were needed to eliminate environmental mycobacteria. We conclude that the presence of a biofilm in the old Patras drinking water network significantly increased the number of environmental mycobacteria in the drinking water. This problem was resorted after the replacement of the network pipes.

Keywords: drinking water, environmental mycobacteria, PCR

1. Introduction

Many different strains of environmental mycobacteria (referred to also as a typical, opportunistic or non-tuberculous mycobacteria) have been isolated from tap water samples collected from municipal systems (Scarlata *et al.*, 1985; Fischeder *et al.*, 1991; Schultze-Robbecke, 1993). Studies in the U.S.A. have shown that clusters of infection by environmental mycobacteria do occur in areas where the water supply is contaminated by these organisms (Wallace, 1987). In England, McSwiggan and Collins (1974) described a large number of infection and colonization of a large number of samples with *M. kansassi*. *M. kansassi* were also isolated from municipal water supply samples in Czechoslovakia (Kaustova *et al.*, 1981). *M. gordonae, M. scrofulaceum, M. gastri* and *M. chelonae* were the isolated mycobacteria from tap waters of different parts of Tuscany (Caroli *et al.*, 1981). Under Greek legislation (relative Directives of the Greek Ministry of the Environment) the search for a typical mycobacteria is not included in the bacteriological ex-

Water, Air, and Soil Pollution **120:** 273–282, 2000.