

# Multiantibiotic Resistance of Gram-Negative Bacteria Isolated from Drinking Water Samples in Southwest Greece

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## Summary

In this study we monitored the sensitivity of 239 Gram-negative bacteria (of fecal and non-fecal origin), isolated from the old drinking water distribution network of Patras in southwestern Greece, to 20 antibiotic agents. Two methods were used to find the multiresistant bacteria (bacteria resistant to two or more antibiotics): the diffusion disk method and a serial dilution method. The Gram-negative bacteria tested were: *Enterobacteriaceae* (62), *Pseudomonas* (145), *Vibrionaceae* (24), *Chromobacter* (3), *Acinetobacter* (2) and others (4). The highest levels of antibiotic resistance were obtained for cephalothin (86.7%), ampicillin (77.5%) and carbenicillin (71%) followed by cefoxitin (55.4%) and cefuroxime (51.2%). Intermediate resistance levels were found for ticarcillin (31.3%), ceftizoxime (31.2%), chloramphenicol (30.3%), and cefotetan (25.2%). Low resistance levels were obtained for cefotaxime (17.9%), sulfisoxazole (15.2%), ceftriaxone (12.5%), tetracycline (11.9%), trimethoprim/sulfamethoxazole (7.4%) and piperacillin (2.4%). Overall 91.3% of the Gram-negative bacteria isolated from drinking water were multiresistant. No resistant strains were found to quinolones, aminoglycosides, imipenem, aztreonam, ceftazidime or cefoperazone. The high antibiotic resistance rate of the isolated microorganisms from the Patras drinking water supply is discussed.

**Key words:** Antibiotic resistance, multiresistant bacteria, drinking water, Greece.

## INTRODUCTION

The occurrence of multiantibiotic resistant bacteria in the potable water of all municipal

distribution systems has significantly increased<sup>1,2,3,4,5</sup>. The increase in bacterial pathogens observed in municipal water systems has been demonstrated in many studies and is significant