SURVIVAL OF ACINETOBACTER BAUMANNII IN NATURAL WATER MEDIA

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INTRODUCTION

Acinetobacter baumannii is an emerging human opportunistic pathogen. It causes nosocomial as well as community-acquired infections in immunosuppressed patients (Towner, 2009; Dexter et al., 2015). A. baumannii expresses resistance to multiple antibiotics and disinfectants and it persists in the environment for a few months (Espinal et al., 2012). There have been several reports of A. baumannii isolates recovered from the natural aquatic environment in the Seine River (Girlich et al., 2010) and the Sava River (Seruga Music et al., 2017) as well as influent and effluent water from the wastewater treatment plant in Zagreb (Hrenovic et al., 2016).

STUDY AIM

The aim of this investigation was to examine the survival rates of A. baumannii in different types of natural water media with different chemical oxygen demand values.

MATERIAL AND METHODS

The experiment was conducted with two multi-drug resistant (MDR) environmental isolates of A. baumannii according to the experimental protocol described in Figure 1.

RESULTS

- In effluent water multiplication of A. baumannii was evident, but not in spring water or seawater
- Survival of A. baumannii after 28 days of incubation was: 124, 89 and 56% in effluent, spring water and seawater, respectively
- Survival rate was dependent on the chemical oxygen demand of water media: 24, 3 and 4 mgO₂/L for effluent, spring water and seawater, respectively

CONCLUSION

- MDR isolates of A. baumannii successfully persist in the natural water media during 28 days at 20°C
- Survival rate of A. baumannii is positively correlated with the availability of nutrients in water media

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REFERENCES


Figure 1. Experimental protocol

A. baumannii
cultivation on
CHROMAgar
Acinetobacter at
42°C/48h

100 mL of sterile water medium
20°C/28 days with stirring

Spring water

Seawater

Nutrient agar plates at 42°C/24h
CFU count
Survival rate calculation

Effluent water (secondary type of municipal wastewater treatment plant)