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Survival of ESKAPE pathogen *Acinetobacter baumannii* in water media of different temperature and pH
Acinetobacter baumannii

- Gram negative non-sporogenic coccobacillus
- Emerging human opportunistic pathogen
- Infections in hospital environment
**Acinetobacter baumannii in the environment**

- Hospital and municipal wastewater
- Wastewater treatment plants
- Natural waters (Seine, Sava)
- Soil contaminated with human solid waste
Aim

- Examine the survival of *A. baumannii* in different temperature and pH conditions in order to predict the behavior of this pathogen inside and outside hospital setting.
Material and methods

- 4 environmental and 1 clinical isolate selected according to their antibiotic resistance profile during 7 weeks

<table>
<thead>
<tr>
<th>Isolate</th>
<th>Clonal origin</th>
<th>Acquired carbapenemase</th>
<th>Antibiotic susceptibility profile</th>
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<td>IC2</td>
<td>OXA-23</td>
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Temperature

- 5 isolates
- Bacterial suspension
- Spring water
- Nutrient broth 1:100
- Nutrient agar 24h/42°C
- Log CFU/mL
- Survival percentage

-20°C, 4°C, 22°C, 35°C, 44°C, 50°C, 63°C
pH

Natural spring water

pH 2  5  7  10  12

Nutrient broth 1:100

Bacterial suspension

22°C

Nutrient agar 24h/42°C

log CFU/mL

Survival percentage
Results - temperature

- **63°C survival 1 hour in SW, 2 hours in NB (pasteurization procedure 63°C/30min)**

- **50°C survival 2 days in SW, 5 days in NB**
Results pH

- pH 2 survival up to 3 hours
- pH 12 up to 5 hours in SW, 24 hours in NB
- pH 5 and 10 no multiplication and no drop
Acinetobacter baumannii

- *A. baumannii* forms smaller translucent colonies together with larger opaque variants
Conclusion

- *A. baumannii* prefers nutrient-rich environment

- Optimal conditions for the survival of *A. baumannii* are room temperature and neutral pH

- *A. baumannii* survives a wide range of temperature and pH values that are unfavorable to most other mesophilic non-sporogenic bacteria

- Multi-drug resistant *A. baumannii* isolates could survive better in harsh environmental conditions
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https://www.pmf.unizg.hr/naturaci