Colistin-resistant *Acinetobacter baumannii* recovered from wastewaters in Croatia

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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 several months (Espinal et al., 2012). Due to the growing antimicrobial resistance rates of clinical isolates of *A. baumannii*, colistin is now considered a last resort antibiotic for the treatment of *A. baumannii* infections. Although colistin-resistant clinical isolates have been sporadically reported in Croatia (Seruga et al., 2017), our monitoring of *A. baumannii* outside hospitals suggested the presence of colistin-resistant isolates in Croatian wastewaters. In this study, colistin-resistant *A. baumannii* recovered from hospital and urban wastewater are reported.

**MATERIAL AND METHODS**

Sample of hospital wastewater (HW), activated sludge and treated effluent at the wastewater treatment plant (WWTP) were collected in 2015 and 2016 (Fig. 1). *A. baumannii* was isolated on CHROMagar. *Acinetobacter* supplemented with CR102 and 15 mg/L of cefsulodin after incubation at 42°C/48h. *A. baumannii* was identified by routine bacteriological techniques and MALDI-TOF MS. MLSL alleles (Oxford/Pasteur) were determined. Susceptibility to clinically relevant antibiotics was determined by MIC values obtained by Vitek2 system. Colistin resistance was confirmed by gradient dilution E-test and broth microdilution method.

**RESULTS**

Three isolates of *A. baumannii* were recovered from untreated HW, one from activated sludge and two from WWTP effluent (Table 1). All isolates were ST-2pas, five were ST-195ox, while one isolate from HW was ST-451ox. These STs correlate with international clonal lineage 2 (IC2). Four isolates were extensively drug-resistant, while two isolates from WWTP effluent were pandrug-resistant (Table 2). Identification of colistin susceptibility by Vitek2 system gave the false negative result for two of six isolates tested. By using the E-test and broth microdilution all isolates were confirmed resistant to colistin.

**CONCLUSION**

Colistin-resistant *A. baumannii* were present in untreated HW and WWTP. The findings suggest the need to disinfest HW and WWTP effluent prior to its discharge into the environment in order to mitigate the propagation of colistin-resistant *A. baumannii*.

**REFERENCES**


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