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Abstract

Putative Role of the YbhFSR Efflux Pump in Resistance of *Aliarcobacter butzleri* to Several Antimicrobials †

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Abstract: The genus *Aliarcobacter* belongs to the *Arcobacteraceae* family, which has nine validly published species. Among them, the species *Aliarcobacter butzleri* is considered the fourth most frequently found *Campylobacter-like* microorganism in human diarrheal stool samples and has also been included in the list of microorganisms considered a serious risk to human health by the International Commission on Microbiological Specifications for Food. Increasing rates of multidrug resistance to different antimicrobials have been described in *A. butzleri* isolates, with efflux pumps being one of the described resistance mechanisms. Efflux pumps of the *ATP-binding cassette* (ABC) family are known to export a wide variety of substances and are ubiquitous in almost all organisms. Several genes coding for efflux pumps of this family are described in the *A. butzleri* genome. Despite the resistance associated with this species being widely described, research on the mechanisms involved in this process is scarce. Therefore, the objective of this work was to evaluate the role of an ABC family efflux pump system in the resistance of *A. butzleri*. To this end, a mutant was constructed via deletion of the *ybhF* gene from the *ybhFSR* operon, a transporter with relevance in the extrusion of antibiotics and metals in other bacterial species. After ensuring that the mutation did not modify bacterial growth, the resistance profile of the native and mutant strains to different antimicrobial agents was evaluated. This analysis included metals, disinfectants, antibiotics, germicides, and an efflux pump substrate. The evaluation was based on the determination of the minimum inhibitory concentration of the antimicrobials using the agar dilution method. The results show differences in the susceptibility of the mutant strain to some of the compounds tested, namely heavy metals and antibiotics, compared to the native strain. It can therefore be assumed that the YbhFSR efflux pump contributes to resistance in *A. butzleri*.

Keywords: *Aliarcobacter butzleri*; ABC efflux pumps; resistance

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