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Antibiotic Resistance of the Genus *Aeromonas* Spp

Saavedra MJ*

Department of Veterinary Sciences, School of Agriculture and Veterinary Science, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal

Abstract

Aeromonads are known to be ubiquitous in several habitats, mainly in aquatic environments and have been described in connection with fish and human diseases, also known to have relatively high antibiotic resistance. In the past few years the resistance levels of the genus *Aeromonas*, particularly to β-lactam antibiotics seems to be increasing. The aquaculture environment may thereby constitute a reservoir for bacterial resistance to clinically relevant antibiotics. It is, therefore necessary, for the development of new alternative chemical and natural compounds to act against these pathogenic bacteria.

Keywords: *Aeromonas* spp.; Antibiotic resistance; Clinical relevance

Species of *Aeromonas* are common inhabitants of aquatic environments and have been described in connection with fish and human diseases [1-4]. The members of this genus are known to cause bacterial infections and possess a relatively high antibiotic resistance. These are among the most common and troublesome diseases of fish and also in clinical relevant cases [5].

The pathogenicity of *Aeromonas* has been associated with numerous virulence factors, including the aerolysin/hemolysin group of genes, the cytotonic enterotoxins Ast and Alt [6-8], the cytotoxin encoded by the *act* gene [9], and a type III secretion system (TTSS) [9-11]. The TTSS is a virulence mechanism that delivers toxins (AexT among others) directly into the host cell and induces apoptosis [9]. In the past few years an increase in resistance levels of the genus *Aeromonas*, particularly to β-lactam antibiotics, has been observed and reported by other authors [12-15]. This evolution towards increasing levels of resistance is, in part, attributed to the production of different β-lactamases, for instance inducible β-lactamases active against penicillins, cephalosporins, and carbapenems [13,16,17]. The environmental incidence of resistance to β-lactam antibiotics seems to be increasing. The aquaculture environment may thereby constitute a reservoir for bacterial resistance to clinically relevant antibiotics.

The development of alternative chemical and natural compounds to act against these pathogenic bacteria is each time more of high importance, since this increasing resistance to antibiotics is a global issue of public health.

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***Corresponding author:** Saavedra MJ, Department of Veterinary Sciences, School of Agriculture and Veterinary Science, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal, E-mail: saavedra@utad.pt

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