

Quantitative assessments to characterise the antibiotic resistance of seafood microbial isolates

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Objective

The objective of this study was to evaluate the Minimum Inhibitory Concentrations (MIC) and the Non-Inhibitory Concentrations (NIC) of *Vibrio parahaemolyticus* isolates against aminoglycoside antibiotics.

Methods

Two *V. parahaemolyticus* strains (M5 and M15) isolated from Mediterranean mussels (*Mytilus galloprovincialis*) and identified by a PCR method with a target *toxR* gene were used in the study. A turbidimetric assay was implemented to investigate the antibacterial activity of gentamicin and tobramycin toward these isolates. The optical density was measured at frequent time intervals at 630 nm. The trapezoidal method was implemented for quantifying the area of the optical density versus time. Hereafter, the Lambert-Pearson model which is based on a Gompertz function was then applied to estimate the MIC and NIC.

Results

MIC and NIC of *V. parahaemolyticus* M5 for gentamicin were found to be 4.78 and 1.23 mg/ml, respectively. On another hand, *V. parahaemolyticus* M15 showed higher MIC (8.07 mg/ml) and NIC (1.36 mg/ml) values. The MIC and NIC of *V. parahaemolyticus* M5 for tobramycin were 2.05 mg/ml and 0.68 mg/ml, respectively.

Conclusions

This study demonstrated that turbidimetric assay was useful for the successful estimation of MIC and NIC against antibiotics. This method can be applied in order to obtain reliable results for MIC and NIC of *V. parahaemolyticus* and address current needs for identifying the antibiotic resistance of food-borne pathogens.