Detection of *opr*L gene and antibiotic resistance of *Pseudomonas aeruginosa* from aquaculture environment

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ABSTRACT

Pseudomonas aeruginosa is a gram-negative rod shape bacterium belonging to the family Pseudomonadaceae. The species is highly adaptable opportunistic pathogen, capable of surviving in a variety of environment, including aquaculture environment. Antibiotics are used in the aquaculture environment, and their improper usage poses a risk of potential transfer of resistance from aquaculture bacteria to human and animal pathogens. This study was conducted to isolate P. aeruginosa from fish, prawn and water samples, followed by PCR detection of oprL gene locus. The antibiotic resistance pattern of the isolates was also determined. Based on the results from PCR analysis performed, 13 isolates of P. aeruginosawere isolated. All of the isolates tested were resistance to at least one antibiotic. Highest level of resistance was observed against ampicillin and erythromycin while the lowest was observed against gentamicin, norfloxacin and nalidixic acid. This study suggested that the presence of the bacteria in the aquaculture environment may pose the risk of antibiotic resistance to those who are exposed to the aquaculture environment.Based on the results of this study, it can be said that gentamicin, norflaxin and nalidixic acid can be effective agents for the treatment of P. aeruginosa.

Keywords: *Pseudomonas aeruginosa*, oprL, aquaculture environment, antibiotic resistance
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INTRODUCTION

Fish culture industry is one of the most important industries as fish and fishproducts are the most important source of protein. It is estimated that more than 30% of fish for human consumption comes from aquaculture (Hastein*et al.,* 2006). Fishery products are also an important product of international trade and foreign exchange earnerfor a number of countries in the world (Yagoub, 2009). Consumption of raw fish or insufficiently processed fish and fish products may pose risks to human health as fish functions as carriers of several microbial and other health hazards.

Bacterial infections are major threats in both wild and culture fishes. *Pseudomonas aeruginosa* is a Gram-negative bacterium present in soil and aquaculture environment (Spiers*et al*., 2000) and is among major pathogens of fish responsible for heavy mortalities and spoilage in fish and fish product. Antibiotics are the most common method nowadays to treat bacterial infection inaquaculture industries. However, emergence of antibiotic resistance is the main concernamong researchers as bacterial resistance towards antibiotics may affect the consumers

148