

ABSTRAK

HUBUNGAN KEBERADAAN GEN RESISTANSI ANTIMIKROBA (*Antimicrobial Resistance Gene*, ARG) GOLONGAN β -LAKTAM DAN FENOTIPE RESISTANSINYA PADA BAKTERI *Vibrio parahaemolyticus*

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Vibrio parahaemolyticus merupakan bakteri patogen oportunistik yang sering ditemukan di perairan budi daya udang vannamei dan berpotensi menimbulkan penyakit pada hewan maupun manusia. Penggunaan antibiotik β -laktam untuk mengendalikan infeksi dapat memicu resistansi, salah satunya melalui keberadaan gen penyandi β -laktamase seperti *ampC* dan *blaTEM*. Penelitian ini bertujuan menganalisis hubungan antara profil fenotipe resistansi β -laktam dengan keberadaan gen *ampC* dan *blaTEM* pada *V. parahaemolyticus*. Sebanyak 42 isolat diperoleh dari udang dan lingkungan budi daya, kemudian diuji fenotipe resistansinya menggunakan metode difusi cakram terhadap enam antibiotik β -laktam, serta dilakukan deteksi gen resistansi dengan PCR konvensional. Hasil menunjukkan bahwa resistansi hanya ditemukan pada antibiotik *ampicillin*, dengan 33 isolat resistan, 3 isolat *intermediate*, dan 6 isolat sensitif. Untuk antibiotik lain (*amoxicillin-clanuvate acid*, *cefotaxime*, *ceftazidime*, dan *meropenem*), seluruh isolat tergolong sensitif. Analisis genotipe mendeteksi gen *ampC* pada 13 isolat, sementara gen *blaTEM* tidak terdeteksi. Beberapa isolat yang membawa gen *ampC* tidak menunjukkan resistansi fenotipik, yang mengindikasikan adanya *silent gene* atau mekanisme lain di luar keberadaan gen tersebut. Penelitian ini menegaskan bahwa resistansi fenotipik β -laktam pada *V. parahaemolyticus* terutama ditunjukkan terhadap ampicilin, dan keberadaan gen *ampC* tidak selalu berbanding lurus dengan pola resistansi yang muncul. Temuan ini penting sebagai dasar pengelolaan penggunaan antibiotik di sektor perikanan serta pencegahan penyebaran resistansi antimikroba yang berpotensi membahayakan kesehatan manusia.

Kata kunci: *Vibrio parahaemolyticus*, β -laktam, resistansi antibiotik.

ABSTRACT

RELATIONSHIP BETWEEN THE PRESENCE OF ANTIMICROBIAL RESISTANCE GENES OF THE β -LACTAM GROUP AND THEIR RESISTANCE PHENOTYPES IN *Vibrio parahaemolyticus* BACTERIA

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Vibrio parahaemolyticus is an opportunistic pathogen commonly found in vannamei shrimp aquaculture waters and has the potential to cause disease in both animals and humans. The use of β -lactam antibiotics to control infection can trigger resistance, one of which is through the presence of β -lactamase-encoding genes such as *ampC* and *blaTEM*. This study aimed to analyze the relationship between β -lactam resistance phenotype profiles and the presence of *ampC* and *blaTEM* genes in *V. parahaemolyticus*. A total of 42 isolates were obtained from shrimp and aquaculture environments, then tested for resistance phenotypes using the disc diffusion method against six β -lactam antibiotics, and resistance genes were detected using conventional PCR. The results showed that resistance was only found in ampicillin, with 33 resistant isolates, 3 intermediate isolates, and 6 sensitive isolates. For other antibiotics (amoxicillin-clanuvate acid, cefotaxime, ceftazidime, and meropenem), all isolates were classified as sensitive. Genotype analysis detected the *ampC* gene in 13 isolates, while the *blaTEM* gene was not detected. Several isolates carrying the *ampC* gene did not show phenotypic resistance, indicating the presence of silent genes or other mechanisms beyond the existence of these genes. This study confirms that phenotypic β -lactam resistance in *V. parahaemolyticus* is primarily demonstrated against ampicillin, and the presence of the *ampC* gene does not always correlate with the resistance pattern that emerges. This finding is important as a basis for managing antibiotic use in the fisheries sector and preventing the spread of antimicrobial resistance, which has the potential to endanger human health.

Keywords: *Vibrio parahaemolyticus*, β -lactam, antibiotic resistance