

INTISARI

ISOLASI BAKTERI NITRITASI DARI AIR BUDIDAYA IKAN DAN KEMAMPUANNYA DALAM MENGOKSIDASI SENYAWA AMONIUM

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Bakteri nitritasi merupakan salah satu grup bakteri yang berperan dalam proses nitrifikasi, dan dapat digunakan sebagai salah satu agensia bioremediasi untuk mengurangi cemaran senyawa nitrogen dalam air kolam perikanan budidaya. Penelitian ini bertujuan untuk mendapatkan isolat bakteri nitritasi yang berkemampuan tinggi dalam mengoksidasi amonium. Sumber isolat berasal dari cuplikan lumpur dan air kolam perikanan budidaya bandeng, udang, lele, dan gurami. Isolasi bakteri nitritasi dilakukan dengan metode *pour plate* pada medium minimal nitritasi dan atau ditambah glukosa. Metode kolorimetri (spektrofotometri) digunakan untuk seleksi kemampuan isolat dalam mengoksidasi amonium menjadi nitrit. Morfologi sel dan koloni serta beberapa sifat fisiologis juga diamati untuk mengetahui karakteristik isolat tersebut. Isolat terpilih diuji aktivitasnya pada media alami air kolam ikan. Dua puluh empat isolat bakteri terbaik telah ditemukan dan memiliki aktivitas oksidasi amonium 0.033-0.284 ppm NO₂/hari. Isolat bakteri terpilih bersifat gram negatif, berbentuk bulat (*coccus*), dan tumbuh baik pada pH 5-8, salinitas 0.5-2% NaCl, di suhu 37°C. Isolat terpilih mempunyai aktivitas spesifik enzim antara 0.052-1.6 unit/mg protein dan laju aktivitas oksidasi amonium pada media alami antara 0.007-0.142 ppm NO₂/hari.

Kata kunci : Air kolam ikan, bakteri nitritasi, oksidasi amonium, nitrit.

ABSTRACT

ISOLATION OF NITRITATION BACTERIA FROM WATER OF AQUACULTURE AND THEIR CAPABILITY IN OXIDIZING AMMONIUM

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Nitritation bacteria is a group of bacteria that plays a role in nitrification process. The bacteria can be utilized as a bioremediation agent to reduce nitrogen compounds polluted in aquaculture pond. This research was aimed to isolate nitritation bacteria that has high capability in oxidizing ammonium. Sources of isolates was sludge and water of milkfish, shrimp, catfish, and giant gouramy aquaculture ponds. The nitritation bacteria were isolated by pour plating on minimal medium of nitritation and or with glucose. Colorimetric method was used to determine nitrite production by the isolates. Cell and colony morphologies and some physiological tests were also observed to determine the isolates characters. The selected isolates were examined their activity in natural water of aquaculture. The best twenty four nitritation bacteria were found and were able to oxidize ammonium 0.033-0.284 ppm NO_2 /day. The selected isolates were gram negative, coccus, and grew well in pH 5-8, salinity 0.5-2% NaCl, and temperature 37°C . The isolates had specific enzyme activity around 0.052-1.6 unit/mg protein, and was also able to grow in natural aquaculture with the rate of ammonium oxidation 0.007-0.142 ppm NO_2 /day.

Keyword : Aquaculture, nitritation bacteria, ammonium oxidation, nitrite.