

Characteristics and Activity of Anti Quorum Sensing Bacillus spp. Isolated from Penaeus vannamei Shrimp Ponds

Title	Characteristics and Activity of Anti Quorum Sensing Bacillus spp. Isolated from Penaeus vannamei Shrimp Ponds
Author Order	3 of 4
Accreditation	1
Abstract	<p>Certain strains of <i>V. parahaemolyticus</i> carry a gene that encodes a toxin that causes Acute hepatopancreatic necrosis disease (AHPND) in <i>P. vannamei</i>. AHPND attacks shrimp post larvae within 20-30 days after stocking causing up to 100% mortality. The expression of these virulent genes is controlled by the quorum sensing system. This system is inhibited by an anti-quorum sensing (AQS) mechanism. Several <i>Bacillus</i> strains have AQS mechanism by producing AHL-Lactonase enzyme. Therefore, this study aimed to obtain <i>Bacillus</i> spp. having AQS activity for controlling AHPND. The study was conducted from isolation and selection of <i>Bacillus</i> isolates, as well as determination of AQS activity. From 22 samples consisting of shrimp intestines, water and pond sediment samples, a total of 151 isolates of <i>Bacillus</i> spp. were isolated. The screening test for AQS activity obtained 11 isolates that showed AQS activity on <i>Cromobacterium violaceum</i>. Determination of violacein pigment in liquid cultures of <i>C. violaceum</i> showed the index value of the pigment formation was between 0.025-0.166 and 0.026-0.567 at 24-hour and between 48-hour incubations, respectively. The quantitative analysis of violacein production showed that there were six isolates of <i>Bacillus</i> could inhibit the pigment production more than 75%. The isolates were identified as <i>Bacillus cereus</i> (four isolates), <i>Bacillus thuringiensis</i> (one isolate), and <i>Bacillus velezensis</i> (one isolate), respectively. The molecular analysis had confirmed that the isolates have <i>aiiA</i> genes encoding AHL-lactonase enzyme. These <i>Bacillus</i> isolates have potential application for controlling AHPND disease.</p>
Publisher Name	Bogor Agricultural University, Indonesia
Publish Date	2021-12-08
Publish Year	2021
Doi	DOI: 10.4308/hjb.29.1.97-106
Citation	
Source	HAYATI Journal of Biosciences
Source Issue	Vol. 29 No. 1 (2022): January 2022
Source Page	97-106
Url	http://journal.ipb.ac.id/index.php/hayati/article/view/37645/22581
Author	RIZAL KHOIRUN ALFISAH, S.Si, M.Si