Phenotypic characterization and antibiotic susceptibility of Vibrio spp. isolated from aquaculture waters on the west coast of Sabah, Malaysia

Abstract

The phenotypic characterization and antibiotic susceptibility patterns of 72 environmental isolates of Vibrio spp. collected from six aquaculture sites along the west coast of Sabah, Borneo, Malaysia was investigated. Up to 21 conventional biochemical tests were carried out and the sensitivity of the isolates against 16 antibiotics were tested using the disk diffusion method. In the present study, 11 species of vibrios were isolated with varying percentage of occurrences, with the three most abundant species being Vibrio harveyi (22.2%), V. parahaemolyticus (22.2%) and V. alginolyticus (19.4%). The isolates produced varying results in the biochemical tests. All environmental Vibrio isolates were found sensitive to chloramphenicol, nalidixic acid and oxolinic acid but exhibited resistance to vancomycin and penicillin. Susceptibility was variable for other antibiotics. As for V. alginolyticus, it was found that 100% of the isolates were sensitive to chloramphenicol, nalidixic acid and oxolinic acid but resistant to ampicillin, novobiocin, penicillin and vancomycin. Meanwhile, all V. harveyi isolates were sensitive to chloramphenicol, furazolidone, nalidixic acid, nitrofurantoin and oxolinic acid but resistant to penicillin and vancomycin. All V. parahaemolyticus isolates were observed sensitive to chloramphenicol, nalidixic acid and oxolinic acid but resistant to ampicillin, penicillin and vancomycin. Since all three are important species implicated in fish and shrimp disease, and two (V. parahaemolyticus and V. alginolyticus) can cause clinical ailments in humans, microbial diversity at similar sites should be investigated further.