

Environmental Factors Associated with the Presence of Vibrionaceae in Tropical Cage-Cultured Marine Fishes

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JOURNAL OF AQUATIC ANIMAL HEALTH
Volume: 31 Issue: 2 Pages: 154-167
DOI: 10.1002/aah.10062
Published: JUN 2019
Document Type: Article
[View Journal Impact](#)

Abstract


This study investigated the environmental factors associated with the presence of Vibrionaceae in economically important cage-cultured tropical marine fishes: the Asian Seabass *Lates calcarifer*, snapper *Lutjanus* sp., and hybrid grouper *Epinephelus* sp. Fish sampling was conducted at monthly intervals between December 2016 and August 2017. The body weight and length of individual fish were measured, and the skin, eye, liver, and kidney were sampled for bacterial isolation and identification. Water physicochemical parameters during the sampling activities were determined, and the enumeration of total Vibrionaceae count was also conducted from water and sediment samples. Nine species of *Vibrio* were identified, including *V. alginolyticus*, *V. diabolis*, *V. harveyi*, *V. campbellii*, *V. parahaemolyticus*, *V. rotiferianus*, *V. furnissii*, *V. fluvialis*, and *V. vulnificus*. *Photobacterium damsela* subsp. *damsela* was also identified. A total of 73% of the isolated *Vibrio* belonged to the *Harveyi* clade, followed by the *Vulnificus* clade (5.5%) and *Cholera* clade (0.6%). Highest occurrence of *Vibrio* spp. and *P. damsela* subsp. *damsela* was found in hybrid grouper (72%), followed by Asian Seabass (48%) and snapper (36%). The associations of *Vibrio* spp. and *P. damsela* subsp. *damsela* with the host fish were not species specific. However, fish mortality and fish size showed strong associations with the presence of some *Vibrio* spp. On average, 60% of the infected cultured fish exhibited at least one clinical sign. Nevertheless, inconsistent associations were observed between the pathogens and water quality. The yearlong occurrence and abundance of Vibrionaceae in the environmental components indicate that they might serve as reservoirs of these pathogens.

Keywords


KeyWords Plus: MUSCLE NECROSIS DISEASE; ANTIBIOTIC-RESISTANCE; PATHOGENIC VIBRIOS; SCALE DROP; PARAHAEMOLYTICUS; HARVEYI; COASTAL; ALGINOLYTICUS; DIVERSITY; ECOLOGY

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Funding

Funding Agency	Grant Number
Universiti Putra Malaysia	GP-IPB/2016/9484101
Higher Institution Centre of Excellence, Ministry of Higher Education	6369100

[View funding text](#)

Publisher

WILEY, 111 RIVER ST, HOBOKEN 07030-5774, NJ USA

Journal Information

Impact Factor: [Journal Citation Reports](#)

Categories / Classification

Research Areas: Fisheries; Veterinary Sciences

Web of Science Categories: Fisheries; Veterinary Sciences

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