

TITLE: THE IMPORTANCE OF *Vibrio alginolyticus* IN THE SCOPE OF THE ONE HEALTH

AUTHORS: BRONZATO, G.F.; OLIVA, M.S.; PRIBUL, B.R.; SOARES, L.C.; COELHO, I.S.; COELHO, S.M.O.; SOUZA, M.M.S

INSTITUTION: UNIVERSIDADE FEDERAL RURAL DO RIO DE JANEIRO, INSTITUTO DE VETERINÁRIA, RODOVIA BR 465, KM 07, S/N ZONA RURAL, SEROPÉDICA - RJ, 23890-000

ABSTRACT:

Vibrio alginolyticus has caused death in fish and mollusks and its high concentration in mussels has also caused diseases in humans. In the marine environment, this bacterium acts as a reservoir of virulence genes to other species of vibrio, such as collagenase, outer membrane proteins (*ompK*) and *toxR* genes. Thus, the objective of this work was to evaluate the virulence profile of this bacterium isolated from *Perna perna* mussels in different points of the coast of Rio de Janeiro. Mussels were collected at different times and places: three on the rocks of the Archipelago of Santana, Macaé, two on the mariculture line of Ilha Grande Bay, Angra dos Reis and two on the beach of Arraial do Cabo, in Rio de Janeiro. The identification of *Vibrio* spp. was performed by biochemical tests and by the MALDI TOF MS technique. The bacterial DNA was extracted by thermal lysis, and PCR was used to detect the virulence, *collagenase*, *ompK* and *toxR* genes. Of the 209 strains of *Vibrio* spp. phenotypically identified, 23.4% (49/209) belonged to *V. alginolyticus*. MALDI TOF MS identified 87.8% (43/49) as *V. alginolyticus*, but 4 strains were identified as *Shewanella putrefaciens* (8.2%) and one strain as *Vibrio parahaemolyticus* (2%). The technique did not identify one strain. The gelatin hydrolysis test, phenotypic analysis of *V. alginolyticus* virulence, all strains of *V. alginolyticus* and *S. putrefaciens* were positive in 95.9% (47/49). Among the 49 strains, 95.9% (47/49) amplified for the collagenase gene, 91.5% (43/47) characterized as *V. alginolyticus*, 6.4% (3/47) as *S. putrefaciens* and 2.1% (1/47) *V. parahaemolyticus* by MALDI-TOF. Expression of the *ompK* gene was observed in 46.9% (23/49) of the strains. Of these, 91.3% (21/23) in *V. alginolyticus*, 4.3% (1/23) in *V. parahaemolyticus* and 4.3% (1/23) in *S. putrefaciens*. Finally, 14.3% (7/49) amplified for the *toxR* gene, all being characterized as *V. alginolyticus*. The analysis revealed that the presence of *V. alginolyticus* in mussels poses a risk to human and animal health. This microorganism is native of the Brazilian coastal environment and its action as a reservoir of virulence genes has generated strains with epidemic potential. The aquatic environment is relevant in the spread of virulence as well as resistance genes.

Keywords: marine environment, *Vibrio*, virulence

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