

Longitudinal Study of Total and Pathogenic *Vibrio parahaemolyticus* (tdh+ and/or trh+) in Two Natural Extraction Areas of *Mytilus chilensis* in Southern Chile

Bacian, C.

Verdugo, C.

García, K.

Perez-Larruscain, J.

de Blas, I.

Cachicas, V.

Lopez-Joven, C.

Abstract [View references \(43\)](#)

Vibrio parahaemolyticus is the leading cause of seafood-associated bacterial gastroenteritis worldwide. Although different studies have focused on its pattern of variation over time, knowledge about the environmental factors driving the dynamics of this pathogen, within the Chilean territory, is still lacking. This study determined the prevalence of total and pathogenic *V. parahaemolyticus* strains (tdh and/or trh genes) in mussels (*Mytilus chilensis*) collected from two natural growing areas between 2017 and 2018, using selective agar and PCR analysis. *V. parahaemolyticus* was detected in 45.6% (93/204) of pooled samples from the Valdivia River Estuary. The pathogenic strains carrying the tdh and/or trh gene were detected in 11.8% (24/204): tdh in 9.8% (20/204), trh in 0.5% (1/204), and 1.5% (3/204) presented both genes. In Reloncaví Fjord, *V. parahaemolyticus* was detected in 14.4% (30/209) of the samples, pathogenic *V. parahaemolyticus* carrying the trh gene was detected in 0.5% (1/209) of the samples, while the tdh gene was not detected in the samples from this area. The total count of mauve-purple colonies typical of *V. parahaemolyticus* on CHROMagar was positively associated by multivariate analysis with area, water temperature, and salinity. Similarly, *V. parahaemolyticus* detection rates by PCR had a positive correlation with the area and water temperature. The chances of detecting total *V. parahaemolyticus* in the Valdivia River Estuary are significantly higher than in the Reloncaví Fjord, but inversely, during spring-summer months, the interaction factor between the area and temperature indicated that the chances of detecting *V. parahaemolyticus* are higher in the Reloncaví Fjord. Interestingly, this period coincides with the season when commercial and natural-growing shellfish are harvested. On the other hand, pathogenic *V. parahaemolyticus* tdh+ was significantly correlated with an increase of water temperature. These environmental parameters could be used to trigger a warning on potential hazard, which would influence human health and economic losses in aquaculture systems.

Author keywords

Mussels

Prevalence

Salinity

Tdh

Trh
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virulence genes
water temperature