Title Retention of *Vibrio parahaemolyticus* in oyster tissues after chlorine dioxide treatment

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Abstract

Vibrio parahaemolyticus is an important food-borne bacterium that is closely related to food poisoning from consumption of raw or lightly-cooked oysters. Therefore, intensive efforts must be taken to depurate the contaminated oysters. Chlorine dioxide (ClO_2) is considered to be a safe and effective disinfectant and is routinely applied for treatment of drinking water and seafood. However, the retention of *V. parahaemolyticus* in oyster tissues has not yet been explored after using ClO_2 as a disinfectant. To address this lack of information, oysters (*Crassostrea gigas*) were artificially contaminated with *V. parahaemolyticus* (ATCC 17802). Individual oysters, the gills and the digestive glands were analyzed by spreading supernatants from homogenized tissues onto thiosulfate–citrate–bile–salt sucrose agar and polymerase chain reaction assays on the resulting bacterial colonies. *V. parahaemolyticus* that bioaccumulated in different oyster tissues could be disinfected completely after 6 h of treatment with 20 mg/L of ClO_2. Thus, ClO_2 appears to be a candidate disinfectant for *V. parahaemolyticus* depuration in oysters. The digestive glands appear to be a promising target tissue for detection of bacterial pathogens in oysters, using either conventional methods or molecular assays. The shelf life of oysters was extended to at least 12 days following 6 h of ClO_2 treatment at 4 °C.