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PREVALENCE AND CHARACTERIZATION OF Vibrio spp ISOLATED FROM FISH PRODUCTS IN UAE

by

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Abstract

Seafood and fish was found to be an important food component for a large section of world population. Sea foods are prone to bacterial contamination, many are pathogenic to human and marine animals, and three species, *Vibrio mimicus*, *Vibrio parahaemolyticus*, and *Vibrio vulnificus*, are responsible for most cases of seafood related human illness caused by *Vibrio* species. The importance of study on effects of these microorganisms to humans in the United Arab Emirates is vital due to the cultural background of the Emiratis as a coastal heritage. A study was conducted to assess the prevalence of *Vibrio* spp in fish and fish products sold in UAE, identify the spp, examine the antimicrobial susceptibility and profile growth conditions and virulence genes of the isolated *Vibrio*. A total of 200 fish samples was collected from 4 different main markets at different emirates (Al-Ain, Dubai, Fujairah and Abu Dhabi) in United Arab Emirates. *Vibrio* spp. were isolated from the collected fish samples and identified by the standard culture method. DNA was extracted from all the isolates and used for molecular characterization by Polymerase Chain Reaction (PCR). The antibiotic study was also performed to find out the resistant and sensitivity of the *Vibrio* species. The factors affecting growth rate and survival of the isolated *Vibrio* spp was studied by analyzing the effect of different parameters such as temperature, pH and salinity. Results showed that *V. paraheamolyticus* was predominant in the isolates. The isolates from Al-Ain showed an incidence of 1 (2%) for *Vibrio mimicus* and were 3 (6%) for each of *V. vulnificus* and *V.paraheamolyticus.* An incidence of 5 (10%) for *V. paraheamolyticus* and 0% for *V. mimicus* and *V. vulnificus* was observed in isolates from Dubai. *Vibrio* isolates from Fujairah showed an incidence of 4 (8%) for *V. vulnificus* and *V.paraheamolyticus*, 2(4%) for *V. mimicus*. The prevalence of *Vibrio* in isolates from Abu Dhabi was 3 % for *V. vulnificus* and *V.paraheamolyticus* and 0% for *V. mimicus.* PCR analysis for the presence of *Vibrio* gene confirmed 129 (64.5%) of the 200 isolates from different emirates as being positive *Vibrio* strains. Antibiotic sensitivity of the isolates were evaluated by measuring the zone of inhibition against 6 common antimicrobial agents. 7 *Vibrio* isolates (15.2 %) in Al-Ain fish samples showed more resistance to antibiotics especially for penicillin 36 (78.2%), daptomycin 43(93.4%), vanomycin 42(91.3%), ampicillin 4(8.69%), erythromycin 8 (17.39%) and sulfamethoxazole-trimethoprim 3(6.5%). 5 *Vibrio* isolates (23.8%) were antibiotic resistant in which 11 isolates showed penicillin resistant (52.3%), daptomycin 21(100 %), vanomycin 20 (95.2%), ampicillin 1 (4.75%) and erythromycin 7 (33.3%). In Fujairah 10 *Vibrio* isolates (21.2%) and the resistance range was in the order daptomycin 36 (76.5 %) > vanomycin 35 (74.4 %) > penicillin 27 (57.4 %) > erythromycin 10 (21.2 %) > ampicillin 7 (14.8 %) > sulfamethoxazole-trimethoprim 2 (4.25 %). The antibiotic resistance of 6 *Vibrio* isolates (40%) from Abu Dhabi were penicillin 12 (80 %), daptomycin 14 (93 %), vanomycin 10 (66.6 %), ampicillin 8 (53.3 %) and erythromycin 1 (6.6 %). The effect of various parameters such as salinity, pH and temperature on growth and survival of *Vibrio* isolates showed *Vibrio* isolated from different locations in UAE exhibited maximum growth rate at 37^{O}C, while increasing the temperature to 47^{O} C, the growth percentage was decreased. The *Vibrio* spp grown significantly at alkaline pH. The maximum growth rate of 81% was observed in pH 5 and 7. Increasing the concentration of NaCl from 0.5% to 2 %, the growth rate of *Vibrio* isolates were increased and optimum growth rate was showed in 1% NaCl. From the results we can conclude that the *Vibrio* isolates from different emirates of UAE showed antibiotic resistance and it is a threat to public health as the antibiotic resistant determinacies transferred to other bacteria of the clinical significance.

Keywords- *Vibro*, Fish, United Arab Emirates, Antimicrobial resistance, Growth rate, Survival