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Isolation of bacterial and fungal sp. of freshwater crab *Paratelphusa jacquemontii* (Rathbun) from local market

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Abstract:

The presence study was to examine the occurrence of bacterial and fungal sp. associated with freshwater crab from local market. The freshwater crabs *Paratelphusa jacquemontii*, which are consumed by peoples. Bulk of the crab meat is obtained by crabbing. A survey of bacteria and fungus associated with part of the crab species was carried out. *Vibrio parahaemolyticus Escherichia coli, Proteus vulgaris, Bacillus subtilis, Klebsiella pneumonia, Pseudomonas aeruginosa, and Staphylococcus aureus* were identified by Biochemical tests (IMViC Tests). and a fungal infection, potentially caused by *Aspergillus sp*., Among the seven bacterial species *E. coli. Vibrio cholera* and *K. pneumonia* were found in all the collected samples. The result of this study exposed that raw crab sold in local crab market has high contamination so the existence of the bacterial sp. and fungal sp. which can cause diseases or pose potential health risks if consumed raw.

Keywords: *Staphylococcus aureus, Klebsiella species, Pseudomonas species and Escherichia coli. Aspergillus sp.*

Introduction:

The fresh water crabs in market are captured from local water bodies around Amravati region. Fresh water crabs provide high quality protein and it also contains omega-3 fatty acids that afford potential health benefits. Crab meat contains several vital minerals & vitamins, such as vitamin B^{12}, which is necessary for proper nerve function. But crabs population decrease day by day by pollution in local water bodies. Decline in the population of the crab species **(Akpaniteaku, 2015)** suggested investigation on other aspects of biology including the impact of bioaccumulation of essential and non essential elements in the environment (Akpaniteaku and Okoye, 2018; Akpaniteaku and Udeozor, 2018). Consumption of infected crab may cause diseases due to infection or intoxication. Some of these diseases are caused by the microorganisms present on the external surfaces including carapace, gills and the gut of the crab. Diverse array of bacterial species including several potential human pathogens could be isolated from edible crabs (Faghri et al., 1984). The ability of freshwater crab to accumulate pollutants and human pathogens has required proper investigations on safety of the crab species as human food source. And potential approach to controlling bacterial diseases of crab, should be helpful

and practicable (Wang, 2011). It could also help in directing the problem of population decline in the wild. The survey was therefore aimed at identifying various bacterial loads that could pressurized P. jacquemontii, and compare them with safety standards for aquaculture and consumption.

Materials and methods:

Laboratory analysis Crab samples Crabs (P.jacquemontii) were collected from a local crab market in Amravati. Totally 10 numbers of samples were collected. The collected samples were aseptically and immediately transported in a thermal bag to the laboratory and processed within 3 h of acquisition, and samples were kept in the refrigerator (4–8 °C).

Sample preparation: The 10 g of the crab body parts sample was cut with a sterile knife. The cut body parts were crushed into small pieces in a sterile mortar with about 10 ml sterile water. From the crushed sample, 1 ml aliquot volume was measured out and homogenized in a clean, dry sterile beaker containing 9 ml of distilled water giving a 1:10 dilution. This was done for the 10 crab samples.

Isolation and identification bacterial and fungal sp.

The collected samples were processed in the laboratory according to the standard microbiological methods under complete aseptic conditions. The swabs were inoculated on nutrient agar and incubated at 37 °C under aerobic condition. For Fungal sp sample grow on PDA agar. The isolated bacterial colonies were identified on the basis of their morphological, physiological and biochemical characters. These culture were subjected to various biochemical tests such as gram staining, motility, indole, methyl red, voges proskauer, citrate, Triple sugar ion, oxidize, carbohydrate fermentation, hydrogen sulfide production tests for identification of phosphate solubilizing bacteria using Bergey's manual of systematic bacteriology (Holt et al.1994). The bacteria such as E. coli, K. pneumonia, P. vulgaris, B. subtilis, P. aeruginosa, Vibrio parahaemolyticus and S. aureus were isolated from the crab samples.

Result and discussion:

Bio-oxidation reactions are very important in bacteria. These reactions help bacteria to provide energy by oxidation of organic substances or by fermentation. The bacteria were identified on the basis of these reactions. We found that isolates have *Vibrio parahaemolyticus* is 20%, *Staphylococcus aureus* near about 30% of isolates and remaining are such as Klebsiella species at 21 %, Proteus vulgaris species at 12% and Escherichia coli at 10%. The *Staphylococci*

aureus were the predominant Gram positive organism (30%) because since these bacteria are found globally in various environments, Bacterial isolates identified as Escherichia coli accounted for only 10% of the total number of isolates.

All the isolates are confirmed by microbiological methods. Similar results have been reported by (Lalitha and Nirmala Thampuran, 2012). Previous research on microorganisms isolated from the crabs includes (Faghri et al., 1984; Najiah et al., 2010; Lalitha et al., 2010). High bacteria count may be due to decomposition of food and environmental contamination. Areas being deposits feeding animal, debris buried in mud near dam water. Crab may accumulate microorganism from their environment and therefore serve as a vector for disease transmission. Fresh water crab affected by pathogen or sewage discharge is known to be a health hazard, and total bacterial count associated with the tissue of crab indicates possible contamination, which may occur through contact with the source (Faghri et. al., 1984).

Fecal by products from humans and cattle due to open grazing and defecation is significant, and can affect the quality of water and fish resources in the river basin (Pers. Obs.). General information about bacterial diseases of crab is available (Wang, 2011). The visible decline in the wild population as reported by Akpaniteaku (2014) could in part, emanate from the bacterial contamination with the reproductive features of the crab species. Bacterial contamination of crab from the sampled area irrespective of size may seem to indicate that selective capture and consumption is irrelevant. Atujona et.al. (2018) reported that immunity of the consumers determine pathogenic response by secretion of virulence factors that facilitate their proliferation. Wang (2011) reported that new diseases associated with pathogens have appeared in aquaculture-exploited crab species. And according to Centre for Food Safety (2015) consumption of raw or uncooked crabs increases the risk of developing food borne diseases.

Conclusion: The results of this study revealed that massive bacterial and fungal count were isolated from different parts of crab. There is need to create awareness among crab eating people. Thus, it can be concluded that these characteristics of water bodies are influenced by seasonal variations. It is recommended that the proper maintenance of the water bodies is necessary. Proper sanitation measures and environmental education to public care essential to keep these water bodies clean and safe. To improve quality of water there should be continuous monitoring of pollution level and maintain the favorable conditions essential for fish, crab

survival, growth and reproduction. There is need for innovative measures to discourage the local population from eating improperly cooked crabs.

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