Characterization of Halophilic Bacteria from Selected Seafood and their Implications in Food Safety and Sustainability

Onifade Ganiyat, Onilude Anthony & Ilesanmi Idayat
Department of Food Technology, The Federal Polytechnic, Ilaro, Nigeria
Corresponding author email: *mustaphaghaniyyah@gmail.com*

Introduction

The diversity of microbial communities in seafood provides a comprehensive understanding of the complex dynamics in these environments. Halophilic bacteria, adapted to thrive in high-salt environments, are the focus of extensive research due to their unique physiological and ecological characteristics. They are found in hypersaline lakes, saline soils, and salted food products, as well as deep-sea brines, plants excreting salt through leaves, and ancient wall paintings. In the context of food safety and quality, the study becomes crucial for assessing and ensuring the microbial quality of seafood products as global concerns regarding food safety continue to rise. Understanding the prevalence and characteristics of halophilic bacteria in seafood is paramount, aligning with efforts to enhance the safety and quality of the global food supply (Li *et al*., 2021). Investigating the characteristic properties of halophilic bacteria from selected seafoods is crucial for both scientific knowledge and practical applications. These microorganisms are ecologically important as they contribute to the understanding of intricate relationships within marine ecosystems.

Materials and methods

Fresh shrimps, crab and lobsters' samples were purchased randomly from Makoko market (Latitude 6.4961° N and Longitude 3.3878°E), Yaba, Lagos. Samples were kept in sterile Ziplock bagsand transported immediately to Microbiology Laboratory for microbial analyses (Isolation of halophilic bacteria, identification and molecular characterization of halophilic bacteria isolates)

Result and discussion

This study categorized halophilic bacteria from selected seafoods based on NaCl concentrations and showed their unique morphological and biochemical characteristics and were classified into extremely halophilic LSC4 *Salinicoccusspp*., moderately halophilic CSC4 *Halomonasspp*., and moderately halophilic SSC7 *Marinobacter*in line withTarawneh*et al.* (2008).*Halomonas* and *Chromohalobacter* produce enzymes used in various industries, making them suitable for biotechnological applications according to Setati (2010). Further molecular identification was done formost prominent halophilic isolate with the highest salt toleranceresulting to *Macrococcusspp*. strain CUAB-ONIF which is a new strain, but its close relationship to *Staphylococcus* strains suggests reclassification within *Staphylococcus*, revealing differences in functional potential and virulence in whole genome sequencing in line with Mazhar*et al.* (2018).

Table 1: Sequence BLAST Prediction Result

Isolates	Suspected organism	Molecular Identified Organism	Accession Number
BF5	*Salinicoccussp*	*Macrococcus*sp.strain CUAB-ONIF	PP657698

Conclusion

Macrococcusspp. is a type of halophilic bacteria, has been found in seafood, posing potential health risks. Despite being harmless, they can harbor resistance genes and form biofilms, requiring ongoing monitoring and research. This highlights their adaptability to high-salinity environments and their significant salt tolerance. The study provides valuable insights into the microbial ecology of seafood, enhancing management practices for seafood safety and quality.