



ORIGINAL ARTICLE

OPEN ACCESS

Biological hazard of Bacteria, *Shewanella putrefaciens* at Sea waters Khazar in IRAN

Mahya Fattahi, Arash Lajhvard

Young Researchers and Elite Club, Ahar Branch, Islamic Azad University, Ahar, Iran.

E-mail: Ramin_lzh@yahoo.com

ABSTRACT

Microbial spoilage bacteria Shewanella putrefaciens as a crime is the sea at low temperatures. However, in recent years the family Shewanellaceae sorted cool and objective of this study is to determine to what extent each of Shewanella species in seafood corruption can be effective. More than 500 species of fish stored as cod and plaice in the Caspian Sea, which produce H₂S had the bacteria were isolated. All strains were identified as strains of Shewanella using phenotypic test. Gene sequence analysis of 16S rRNA was a great help in identifying the bacteria. The bacteria GC base percentage and a maximum of 47% is at least 44%.

Keywords: sea, bacteria *Shewanella putrefaciens* biological Hazard

Received 20.06.2015

Revised 21.07. 2015

Accepted 01.08.2015

Introduction

It's actually kind of cool *Shewanella* and able to reproduce and grow at zero degrees Celsius. As a result of the corruption of the Caspian Sea fish due to the decrease of temperature and hydrogen sulfide gas produced by infection with the bacterium *Shewanella* can be attributed *putrefaciens* [1]. In 1985, a new family by *Shewanella* microbiologist James Schwann fishery was introduced. Proteo back *Shewanella* family of bacteria and the class has 44 gamma Proteo and gender [2]. And movable rod-shaped Gram-negative bacterium *Shewanella putrefaciens* and anaerobic glucose fermentation process is capable of doing. The anaerobic bacteria are found in the deep sea and reef [3]. These bacteria produce hydrogen sulfide is certified organic and inorganic sources, as well as with a number of electrons capable of anaerobic respiration [4]. *Shewanella putrefaciens* prominent role in the corruption of marine fish and other seafood plays [5].



Figure 1: Marine fish contaminated with bacteria *Shewanella Putrefaciens*.

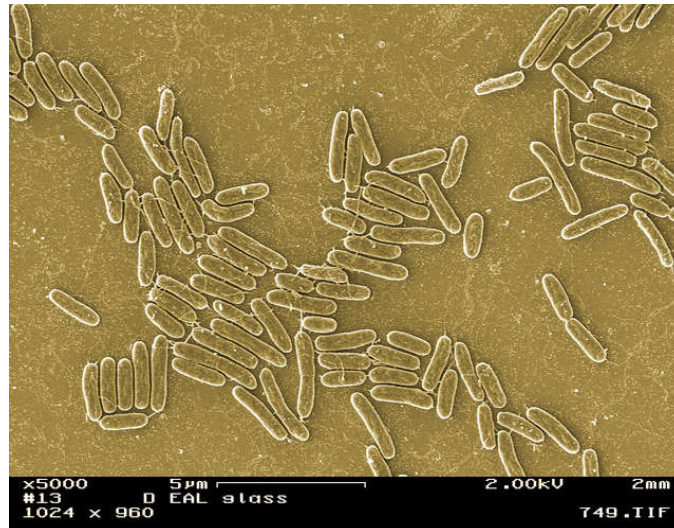


Figure 2: Bacterial colonies shewanella putrefaciens.

Psychrotrophic nature and ability to reduce the temperature and hydrogen sulfide gas produced by bacteria in the spoilage of fish kept at low temperatures coordinate points [6]. These bacteria are also able to analyze sulfur amino acids such as methionine and cystine is therefore plays an important role in reducing protein synthesis [7]. In the event of contamination of fish in *Shewanella putrefaciens* more adapted to the selection pressure of prolonged cold storage [8].

MATERIALS AND METHODS

H₂S-producing bacteria tests during storage. Check bacterial fish from the Caspian Sea (a flatfish and cod) were infected with *Shewanella putrefaciens* was in 2015. Sea water temperature of 1, 17 and 20°C respectively. The fish were kept on ice at 0 °. Samples were taken from the abdominal region of the heart on 0-7-14-21. Homogenized sample was diluted in sterile powder and iron agar at 25 ° C for 3 days. After 3 days of black and white rings of hydrogen sulfide in the composition of the culture medium was created and established colonies were counted.

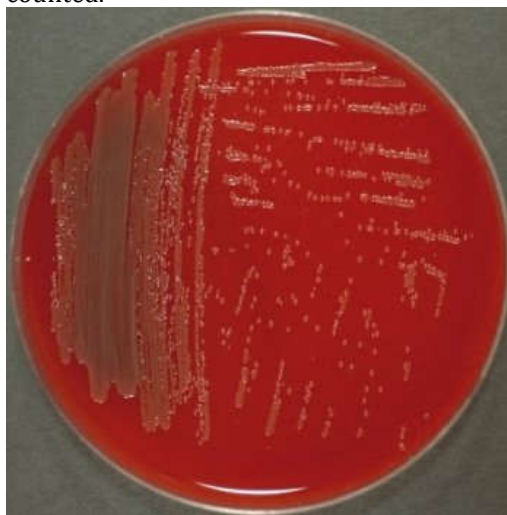


Figure 3: Colony of *Shewanella putrefaciens*.

Isolation:

20 colonies of black iron agar medium was removed. More examples of veal infusion broth were pure iron agar at 25-80 ° C in liquid medium with 4% glycerol and 2% skim milk was kept dry.

Identification of bacteria:

All strains at 25 ° C were tested for the following characteristics: A) Reaction Gram- B) motility and cell shape (phase contrast microscopy) - C) Cytochrome oxidase - D) reaction catalase- E) hydrogen sulfide from Thiosulfate - F) fermentation of glucose.

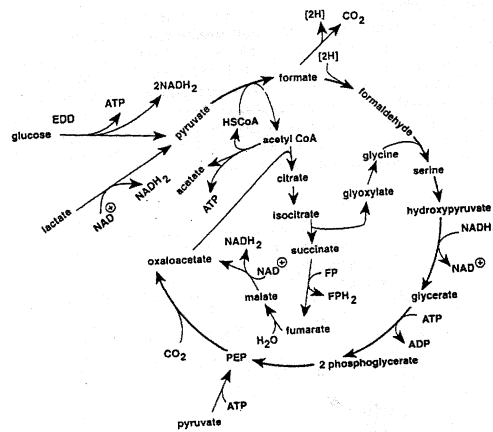


Figure 4: The reaction of glucose fermentation cycle Glycogenesis

RESULTS AND DISCUSSION

DNA extraction and PCR:

The bacterium *Shewanella putrefaciens* lysosomal using DNA sequencing and PCR were as follows: (3'-GAGTTTGATCMTGGCTCAG-5') and (5'-AAGGAGGTGATCCANCCRCA-3') denaturation for 1 min at 95 °C annealing for 2 minutes at 55 °C for 3 min, and elongation at 72 °C in 35 cycles were performed.

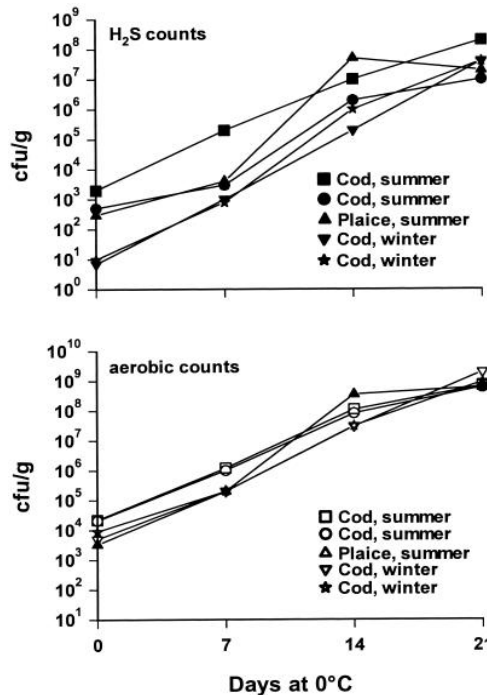


Figure 5: Results of the PCR reaction

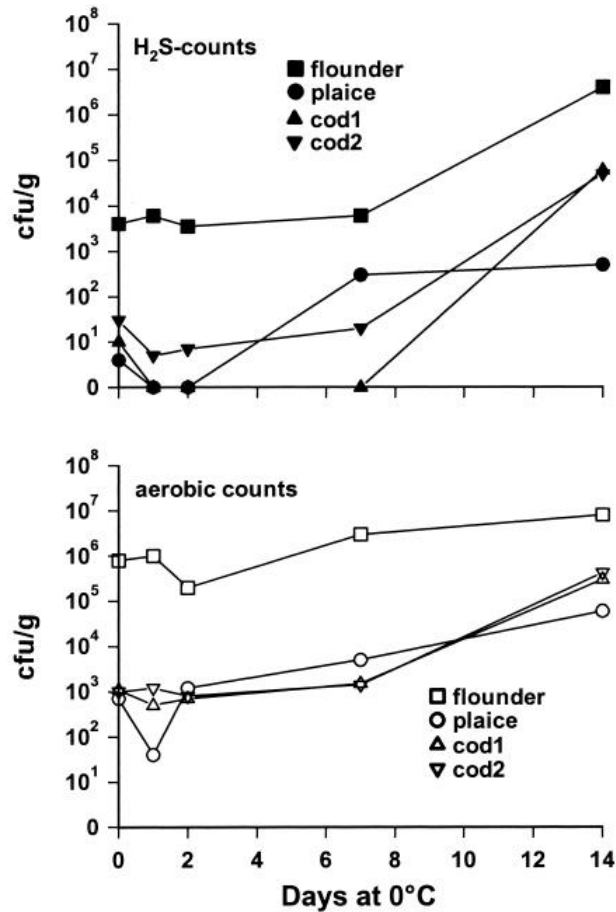


Figure 6: Results of the PCR reaction

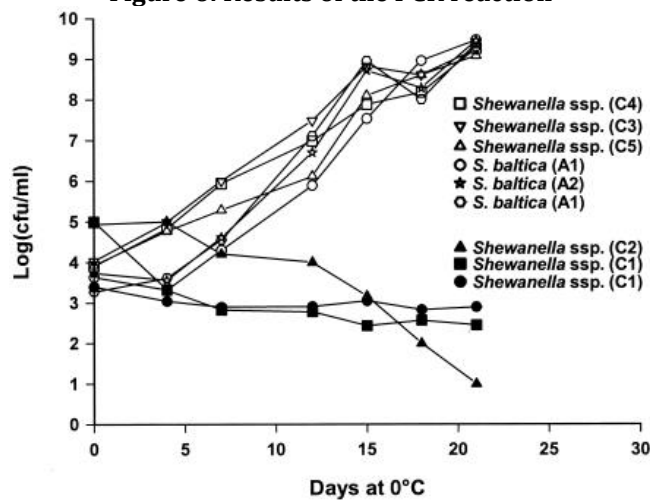


Figure 7: Results of the PCR reaction

Given the importance of using seafood to meet the needs of organisms, including human cells should be useful metabolic integrity of marine organisms such as fish and shrimp to assign more importance And in this sense because it monitors strategic indifference to the life cycle of the fish life will be endangered in the future So you have the knowledge of the organisms used for purification of Genetic Engineering and Biotechnology.

REFERENCES

1. "Biohydrocarbons: New platforms for producing liquid fuel." 2009. University of Minnesota.
2. Derby H, Hammer B. (1931). "Bacteriology of butter. IV. Bacteriological studies of surface taint butter." Iowa Agric. Exp. Stn. Res. Bull. 145:387-416.

3. Fredrickson, J, et al. (2008). "Towards environmental systems biology of *Shewanella*." Nature Reviews in Microbiology. Volume 6:592-603.
4. Gorby YA, Yanina S, McLean JS, Rosso KM, Moyles D, et al. (2006). "Electrically conductive bacterial nanowires produced by *Shewanella oneidensis* strain MR-1 and other microorganisms." Proc. Natl. Acad. Sci. USA 103:11358-63.
5. Gorby, et al. (2010). "Electrical transport along bacterial nanowires from *Shewanella oneidensis* MR-1."PNAS. 108(16).
6. Gralnick and Hau. (2007). "Ecology and biotechnology of genus *Shewanella*." Annu Rev Microbiol.61:237-58.
7. He, Z. et al. (2005) "Electricity generation from artificial wastewater using an upflow microbial fuel cell." Environ. Sci. Technol. 39, 5262-5267.
8. Lies DP et al. (2005) "*Shewanella oneidensis* MR-1 uses overlapping pathways for iron reduction at a distance and by direct contact under conditions relevant for biofilms."Appl Environ Microbiol 71:4414-4426.

CITATION OF THIS ARTICLE

Mahya Fattahi, Arash Lajhvard. Biological hazard of Bacteria, *Shewanella putrefaciens* at Sea waters Khazar in IRAN. Bull. Env. Pharmacol. Life Sci., Vol 4 [9] August 2015: 53-57