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Isolation and Identity of Halophiles in The Floating Bath Water in Yuncheng

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1 Introduction

The study of floating bath began in 1914, by Dor. John C. Lily, the expert of medical and neurology. She has done different kinds of floating experiments to study about the origin of consciousness and the relationship with brain. Previous research showed that the effect of floating therapy was remarkable. It was called “restricted environmental stimulation therapy” (REST). Floating bath in salt lake uses the principle of the density of brine is heavier than human being's. So that people can float on the salt lake and enjoy the fully relax of body and mind to have a well rest. And the microbe and mineral is good to health. As there is few report about the study of the microbe in the salt lake, we know little about the health effect and the mechanism of the microbe. This research is about to separate and cultivate the microbe in floating bath of Yuncheng salt lake. It also lays a foundation to study the human health mechanism of halophiles.

2 Materia and methods

The floating bath water was collected from the Yuncheng. The chemical composition was measured. The culture of halophiles was carried out in lab. The culture media MGM contained: Salinity 18% MGM (g/L) : 30% salt water 600mL, typtone 5, Yeast extraction 1, pure water 367mL. add the agar 15 for solid media. The culture strain were stained by Gram stain, observed under microscope and record the shape and size. The genomic DNA was extracted by SDS and proteinase K method. PCR of 16SrRNA gene was performed using the primers of 27F, 1492R. The PCR products were linked to pGEM-T vector according to the manufacture's instruction using the pGEM-T vector kit (Promega). The recombinants were sequenced. The sequences of 16SrRNA gene were analyses using the DNAMAN software. BLAST was done

on NCBI website on line. The phylogenetic tree was built using N-J method.

3 Results and discussion

The bacteria density was measured using the step dilution methods. The culture was carried out at 37°C in incubator. After 3 day, the colonies grow up, and count the number (Fig 1). There were two type of colony. Most of them are red, others are white. The white colony grew faster than the red one. The bacteria density of the water was 4.4×10^3 ind./mL.

The observation of 34 strains under microscope showed that the red strain were the rod bacteria; others are the bacillus with the spore at top (Fig 2, 3). The homology analyses of DNA showed that there were 4 types of strain : one type has 4 strain YCFB1、YCFB2、YCFB5、YCFB6; second, one strain YCFB8; third 2 strains YCFB4、YCFB7 and fourth 1 strain YCFB3 (Fig 4). The BLAST analyses indicated the strains isolated from floating bath water

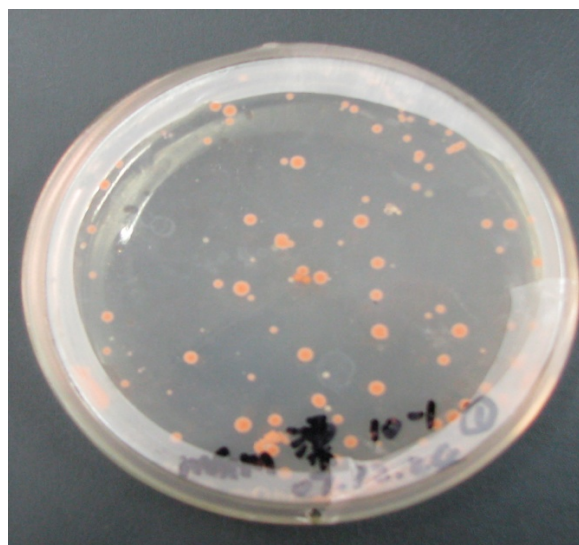


Fig. 1. The red colonies of halophiles on petri dish with MGM media and salinity 18%.

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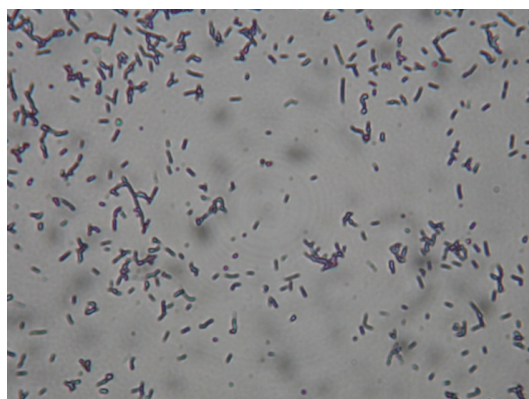


Fig. 2. The morphology of halophiles under microscope , strain 1(400×).

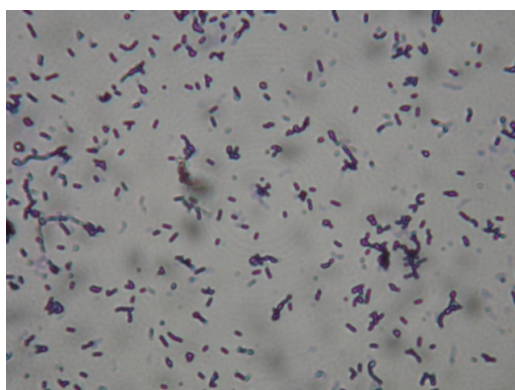


Fig. 3. The morphology of halophiles under microscope, strain 4(400×)

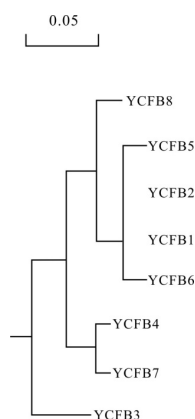


Fig. 4. The homology of the 8 strains according the 16SrRNA gene sequences.

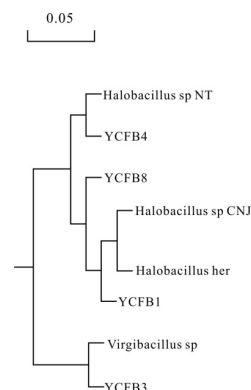


Fig. 5. The phylogenetic tree of isolated strain from floating bath water.

belong to halobacillus and virgibacillus (Fig 5).

4 Summary

The density of floating bath water was 4.4×10^3 ind/mL. The morphology of bacteria showed two types: red rod bacteria and bacillus with spore at top. The homological analyses of 16s rDNA indicated 4 types of strains. The BLAST analyses indicated the strains isolated from floating bath water belong to halobacillus and virgibacillus .

Key words : Floating Bath ; Halophiles ; Halobacillus; Virgibacillus

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