1 Introduction

It is the focus of geology and biology that the creature preserved in the geological history and the organic evolution. The creature preserved in geological history by these things: sedimentary, frozen earth, chrysophoron and evaporation salt. Evaporation salt can preserve the microbe and biomarker compounds. As the recovery of the evaporation and the trace of water on Mars, the creature in the fluid inclusions in evaporation salt has become an important evidence of the signs of life on Mars. This study introduced a method to extraction the DNA of halophiles entrapped in the fluid inclusions in halite.

2 The halophiles in the fluid inclusions

We put the halophile of DL-S-2 into the solution of fluid inclusions in halite evaporated in the lab. DL-S-2 belongs to Halobacillus sp, it is Cocci, and its diameter is 0.5 μm (Fig 1).

3 Methods

First we do the surface sterilization for the sample to ensure that there no contamination DNA of the surface (Sankaranarayanan et al., 2011). Than we dissolve the
sample into the nano pure water. We use Amicon Ultra-0.5 Centrehall Filter Devices (500μl) (Carrigtwohill CO.) to collect the cells. And we use DNeasy Blood &Tissue (Qiagen CO.) to extract DNA. At last, we use PCR technique to amplify the DNA.

4 Results

(1) We test the concentration of DNA by UV Spectrophotometer and the result is in Tab 1.

(2) We use the electrophoresis analysis to test the PCR result (Fig 4).

The BLAST results showed that the sequences of 16sRNA gene from Fluid inclusion in salt crystal has 99% homology with that of DI-S-2 strain which was the original strain before the fluid inclusion formed. It demonstrated that this method was efficient to extract DNA from fluid inclusion of salt crystals.

5 Discussion

Using this method, we can successfully extract the DNA of DL-S-2 entrapped in the fluid inclusions. But we can’t identify if there is any contaminate DNA. To ensure that, we may put an unrelated DNA on the surface of the sample. And detect this DNA after surface sterilization.

Key words: Fluid inclusions in halite; halophiles; DNA extraction

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References


Tab 1 The testing result of DNA density by UV Spectrophotometer

<table>
<thead>
<tr>
<th>Name of the samples</th>
<th>object</th>
<th>concentration(ng/μl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5g sample (surface sterilization)</td>
<td>DNA</td>
<td>6.74</td>
</tr>
<tr>
<td>1g sample (surface sterilization)</td>
<td>DNA</td>
<td>8.79</td>
</tr>
<tr>
<td>0.5g sample (no surface sterilization)</td>
<td>DNA</td>
<td>12.85</td>
</tr>
<tr>
<td>1g sample (no surface sterilization)</td>
<td>DNA</td>
<td>12.18</td>
</tr>
</tbody>
</table>

Fig. 4. Electrophoresis analysis of PCR
M: 100bp DNA ladder marker; 1: 2013-12-9 surface sterilization 0.5g sample; 2: 2013-12-9 surface sterilization 1g sample; 3: 2013-12-9 unsterilized 0.5g sample; 4: 2013-12-9 unsterilized 1g sample; 5: 2013-12-5 surface sterilization 0.5g sample; 6: 2013-12-5 surface sterilization 1g sample; 7: 2013-12-5 unsterilized 0.5g sample; 8: 2013-12-5 unsterilized 1g sample; 9: blank