



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> Arthur G. Platel	<b>Project Number</b> <b>J1324</b>
<b>Project Title</b> <b>Does Ocean Temperature Affect the Microbial Degradation of Oil Spills?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I wanted to see if water temperature had any affect on the amount of oil digested by microbes. I thought that this would be important in cleaning up oceanic oil spills. The microbes I used occur naturally in seaweed and they could have evolved in cool ocean temperatures. I hypothesized that microbes in cold water would eat the most oil.</p> <p><b>Methods/Materials</b> I investigated a total of 30 cultures of Lactobacillus microbes in test tubes. Each test tube had uniform amounts of water, microbes, and unused car oil. 10 where refrigerated. 10 were placed in heated water baths. 10 were kept at room temperature. All were kept in the dark. I took temperatures to insure consistent conditions. I measured the amount of remaining oil and microbes in mm at regular intervals.</p> <p><b>Results</b> After 5 weeks, the refrigerated microbes had eaten all the unused motor oil. The second group of microbes to digest the most oil were the cultures at room temperature. The heated group digested the least amount of oil.</p> <p><b>Conclusions/Discussion</b> Cool temperature water was the best environment for oil digesting Lactobacillus. Lactobacillus, therefore, appears to be "psychrophiles," or cold loving bacteria. In terms of cleaning oil spills, since microbes are sensitive to temperature, it would be important to use microbes viable in the local water temperature to get the job done quickly and reduce harm to the environment.</p>	
<b>Summary Statement</b> What is the effect of temperature on the microbial degradation of petroleum?	
<b>Help Received</b> Mother helped type report and made sure I didn't contaminate our garage; Dad bought test tubes and microbes, took pictures, and disposed of microbial oil at recycling center; science teacher helped get my project into the GSDSEF.	