



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> Paul A. Westhart	<b>Project Number</b> <b>J0935</b>
<b>Project Title</b> <b>The Effect of Acid Rain on Oil-Degrading Microbes</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of my experiment is to determine if certain oil-degrading microbes are affected by acid rain.</p> <p><b>Methods/Materials</b> Place 60 mL of distilled water, 20 drops of refined oil, 0.5 g of nutrient fertilizer and a density strip in 7 jars. Inoculate 2 jars with 6 mL of Penicillium, 2 jars with 6 mL of Pseudomonas and 2 jars with 6 mL of Bacterial Blend. The seventh jar is the control jar and contains no microbes. Separate the experimental jars into 2 groups, leaving one group at pH 7.5 and lowering the other group to pH 5 to mimic acid rain. Incubate the jars at 30 degrees Celsius for two weeks. Measure the turbidity of the jars with the density strips and the rate of oil degradation with the oil-degradation scale daily.</p> <p><b>Results</b> The Bacterial Blend degraded 80% of the oil at pH 7.5 and 50% at pH 5. Pseudomonas degraded 70% of the oil at pH 7.5 and 30% at pH 5. Penicillium degraded 50% of the oil at pH 7.5 and 20% at pH 5. The control jar showed no evidence of oil degradation. The colors of the jars at pH 7.5 were quite turbid compared to the control, indicating microbial population growth and activity. The colors of the jars at pH 5 were slightly darker than the control, indicating less microbial activity and growth than the pH 7.5 jars. The oil was fragmented into tiny droplets in the pH 7.5 jars but not in the pH 5.0 jars.</p> <p><b>Conclusions/Discussion</b> The data supports my hypothesis that acid rain negatively affects the activity of oil degrading microbes because the microbes become inactive or die due to the acidity of the environment. The results show that bioremediation is an effective method for cleaning oil spills in non-acidic environments.</p>	
<b>Summary Statement</b> My project tests the effect of acid rain on bioremediation.	
<b>Help Received</b> My teacher obtained and supervised my use of the microbes. My dad helped type the report.	