



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Kathleen Estrella; Jason Nettleton	Project Number S1707
Project Title Investigating Bacteria on Oil Spots by Developing Bioremediation Measurement Methods	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of the study was to investigate bacteria found on oil spots by examining the effect of the presence of motor oil on the microbes and eventually determine if they possess bioremediation capability. In addition our project aimed to develop simpler methods for measuring possible bioremediation.</p> <p>Methods/Materials Bacteria were collected from oil spots in four different locations around High Tech High School in Point Loma by swabbing each location twice for a total of eight samples. The bacteria were isolated and six of the samples were subjected to three different developed Methods. Method One used surface application of used and unused motor oil on Nutrient agar plates with streaked bacteria. Method Two utilized a mixture of concentrations used motor oil and Nutrient Agar with bacteria broth culture (.5 %, 1% and 5%). Method Three combined bacteria broth culture and used motor oil in a 1 ml serological pipette. The Kirby Bauer-method was also applied to investigate the effect of presence of oil on bacteria by applying amounts of used and unused motor oil on sterile discs which were placed on top of plates with streaked bacteria.</p> <p>Results In all three methods, active growth of environmentally-isolated bacteria in the presence of used motor oil was found. Within Method One it was discovered that the samples had an approximately 200% more growth in terms of surface area in the used motor oil as opposed to the unused motor oil. Method Two did not yield very many results due to the difficulty of measuring any growth. Method Three also did not have conclusive results. The Kirby Bauer-Method however was consistent with the results of the other findings, because the zones of inhibition for used motor oil as opposed to unused motor oil were much lower.</p> <p>Conclusions/Discussion The data and results from this study show that the bacteria that was isolated can survive in the presence of used motor oil. However, the methods used do not show that the bacteria depleted the motor oil; used or unused. Most samples could survive, although in higher amounts, used motor oil seemed to impede the growth of the bacteria. Overall, the results from the study show some of the samples found have the potential to degrade motor oil. Through further investigation and experimentation, these species may perform bioremediation and be used to combat urban runoff pollution.</p>	
Summary Statement This project investigated the possible bioremediation capability and effect of motor oil on bacteria found on oil spots by developing methods of simpler bioremediation measurement.	
Help Received Teacher supplied lab equipment	