



# CALIFORNIA STATE SCIENCE FAIR

## 2004 PROJECT SUMMARY

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| Name(s)<br><b>Matthew S. Palmer</b>   | Project Number<br><b>S1913</b> |
| <b>Project Title</b><br><b>Does Global Warming Affect Bacterial Bleaching of Coral?</b>   |                                |
| <b>Objectives/Goals</b><br>Recent research on coral bleaching suggests the bacterium <i>Vibrio shiloi</i> might cause coral bleaching as water temperature increases. <i>Vibrio shiloi</i> renders algae that feed the coral and give coral its coloration, unable to photosynthesize, which kills the algae. This stresses coral to expel the algae and turn white (bleach). If it is unable to replace the algae, the coral will eventually die. Most of the new research on <i>Vibrio shiloi</i> has been done on Red Sea and Mediterranean Sea corals. The water temperatures in these seas is naturally high (27°C) and the indigenous corals thrive, leading the researchers to discount that global warming alone can bleach corals. I believe that the coral in the tanks with <i>V. shiloi</i> and global warming will bleach faster than the coral in the tank with <i>V. shiloi</i> alone. | <b>Abstract</b>                |
| <b>Methods/Materials</b><br>Four tanks were set up, one as a control, one with global warming, one with corals inoculated with bacteria, and one with both inoculated with bacteria and global warming. The temperatures in the tanks simulating global warming were raised by 2°C a week.  |                                |
| <b>Results</b><br>My hypothesis that global warming affects bacterial bleaching of coral, eluded me and I have again confirmed that Global Warming does not affect coral directly.  |                                |
| <b>Conclusions/Discussion</b><br>Several possible factors may have affected my results. 1) The time I had for experimentation was short, 4 weeks, when it takes 5-6 weeks to cause bleaching with the bacteria 2) Coral does have an immune system and defenses against infection. 3) <i>Vibrio shiloi</i> is species specific. And although researchers have been able to force infection in numerous species of coral in the laboratory, in the wild <i>Vibrio shiloi</i> only infects <i>Oculina Patagonica</i> . As, I proved in my last project, the issue of coral bleaching and any relationship to global warming is much more complex than global warming alarmists would have you believe.  |                                |
| <b>Summary Statement</b><br>Determine if bacteria in conjunction with global warming alone, is responsible for bleaching of coral.  |                                |
| <b>Help Received</b><br>Dr. Eugene Rosenberg, of the Department of Molecular Microbiology and Biotechnology at Tel Aviv University provided access to cultures & Dr. Hiam-Rosenblat provided procedures for their use. Alix Purdy of Scripps Institute provided cultures. Parents provided materials. Mr. Peter Starodub supervised   |                                |