



# CALIFORNIA STATE SCIENCE FAIR

## 2003 PROJECT SUMMARY

Name(s) <b>Alexandra J. Berger</b>	Project Number <b>S1301</b>
<b>Project Title</b> <b>Salinity's Effect on the Ammonia Nitrification Rate of Nitrosomonos sp. Bacteria</b>	
<b>Objectives/Goals</b> The scientific question I asked was, "What is the effect of subjecting Nitrosomonos sp. ammonia nitrifying bacteria to increasing salt concentrations? If there is an effect, can it be minimized by reducing the rate of salt addition?" I hypothesized that the salt would have a negative effect on the ammonia oxidation rate of the Nitrosomonos sp. bacteria, however this affect could be minimized by the slow addition of salt, rather than the sudden addition of it.	<b>Abstract</b> Materials: Erlenmeyer flasks, an Imhoff Settling Cone, a refractometer, Instant Ocean salt, plastic vials, syringes, Flow Injection Anaylsis machines, Nitrosomonos sp. bacteria, and ammonium chloride.  Procedure: I added salt to Nitrosomonos samples to reach their varying salinities immediately. I added .59 grams of salt each day to different samples to reach these salinities and 1.19 grams of salt each day to reach these salinities. After each sample had reached its desired salinity, I added ammonia and took samples at 0, 2, and 4 hours. I measured the ammonia concentrations in Flow Injection Analysis machines.
<b>Results</b> Fast addition: The bacteria at 5ppt oxidized 52% slower then the control at 0ppt, the 10ppt oxidized 40% slower, the 15ppt oxidized 41% slower, the 20ppt oxidized 42% slower, the 25ppt oxidized 50% slower, and the 30ppt oxidized 60% slower. Medium Addition: The 5ppt oxidized 29% slower, the 10ppt oxidized 9% faster, the 15ppt oxidized 66% slower, the 20ppt oxidized 82% faster, and the 25 and 30ppt oxidized 88% faster. Slow Addition: The 5ppt oxidized 19% slower, the 10ppt oxidized 38% slower, the 15ppt oxidized 49% slower, the 20ppt oxidized 47% slower, the 25ppt oxidized 63% slower, and the 30ppt oxidized 77% slower.	
<b>Conclusions/Discussion</b> I have concluded that my hypothesis is partially correct. Although the addition of salt did have a negative affect on the bacteria, the bacteria were least affected by the salinity when the salt was added all at once, rather then over a period of time. Because the bacteria were only exposed to the salt for a short amount of time, they did not go through the shock of having to deal with the extra salt.	
<b>Summary Statement</b> My project is about the effect of varying salinities on Nitrosomonos sp. bacteria, an essential part of the nitrification cycle in aquariums.	
<b>Help Received</b> Used lab at Aquaria Inc.	