



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Garrett K. Soiland	Project Number S1912
Project Title Effects of Dilution on Carnivorous Pitcher Plant Digestive Enzyme Concentration	
Abstract Objectives/Goals Objective was to determine whether pitcher plants (specifically <i>Nepenthes Ventricosa</i> ,) a type of carnivorous plant, are capable of reacting to changes in their trap environment and taking compensatory action to maintain a particular set of conditions in their pitchers. Methods/Materials 23 pitchers of the carnivorous plant <i>Nepenthes ventricosa</i> were covered with plastic bags before opening. One group of pitchers had been covered in October and their digestive fluid was diluted in December; these were the "old" pitchers. The other group of pitchers was covered in December and diluted after opening; these were the "new" pitchers. Controls measured normal enzyme levels. In non-control pitchers, digestive fluid was diluted with distilled water. Samples were taken immediately before and after dilution, and also at several day intervals after dilution for several weeks to track the rate at which plants secreted more digestive enzymes. Results Data varied greatly but in general indicated that older pitchers did not react to dilution, but younger pitchers did secrete more enzymes after dilution. This also occurred in the young controls, which indicates that the younger pitchers were not reacting to the dilution of their digestive fluid, but instead were still in the process of secreting the enzymes they were to use throughout their lifetimes when dilution was carried out.	
Summary Statement Carnivorous pitcher plant digestive fluid was diluted and the concentration of digestive enzymes was tracked for weeks afterward to determine if the plants secreted extra digestive enzymes to compensate for the dilution.	
Help Received Prof. Nick Anast supervised lab work, gave input on how to collect samples and scope of project. Prof. Patricia Ellison donated some lab supplies. Prof. Kenji Takahashi and many, many others gave advice on how to test for nepenthesin enzyme. California Carnivores allowed greenhouse access.	