



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Eric T. Felix	Project Number S1906
Project Title The Risks of Autotomy to Future Survival in Pachygrapsus cressipes	
Abstract Objectives/Goals A series of experiments were conducted on the intertidal crab <i>Pachygrapsus cressipes</i> . When these animals are subjected to mechanical stimulus, such as a predator attempting to remove them from rocks, they respond by either fleeing, or fighting. When choosing to fight, crabs will pinch the predator with powerful claws hoping that the action will make the predator loose its grip. When choosing to flee, crabs will autotomize (self-amputate) the limb(s) being held onto in order to escape. Each time the crab is harassed, it must decide which behavior is most beneficial to its survival. Experiments were conducted in order to test the hypothesis that the decision to autotomize reflects the crab's ability to weigh the risks of future disadvantage to foraging, and more importantly, its ability to adjust its assessment of risk versus benefit as conditions change. Methods/Materials Experiments were conducted by placing the crabs in tanks, allowing them to feed for 7 days, then removing the remainder of uneaten food. The presence of autotomy was then recorded as the choice of <i>Pachygrapsus cressipes</i> to amputate a limb in response to the mechanical stimulus of a narrow forceps. Results In round I, the incidence of autotomy dramatically decreased within only 3 days of starvation and decreased further after the third day. In round II, the incidence of autotomy decreased after only one day of starvation. The number of autotomized individuals was then compared to a control group of fully fed crabs using a c2 test in both round I and round II. Conclusions/Discussion The results indicated that the crabs autotomize less and less with greater starvation time.	
Summary Statement My project attempts to ascertain whether or not starvation is a factor in the innate decision of <i>Pachygrapsus cressipes</i> to autotomize.	
Help Received	