



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Hippolyte Goux</b>	<b>Project Number</b> <b>S1903</b>
<b>Project Title</b> <b>Adaptive Dorsal Patterning and Morphological Variation in the Salamander <i>Ensatina klauberi</i></b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The aim was to test the hypothesis that the color pattern of the salamander <i>Ensatina klauberi</i> is cryptic. It was also to compare the <i>Ensatina</i> salamander species <i>klauberi</i> and <i>platensis</i> to determine if their different dorsal pattern is due to dissimilarities in habitat background.</p> <p><b>Methods/Materials</b> Specimens of the species <i>klauberi</i> and <i>platensis</i> were where found and photographed at four sites in California. Photographs were then analyzed using Scion Image Analysis Software. Three aspects of the salamander's dorsum were quantified: 1) the Relative Average Spot Area, 2) the percentage of the dorsum covered by spots (Percent Cover), and 3) the number of spots on the dorsum. For the ground cover in <i>Ensatina</i>'s habitat, three areas at each site were randomly selected and photographed. The percent cover of light and dark areas in the background was then measured.</p> <p><b>Results</b> Between-group analysis revealed two different patterns: 1) in the <i>platensis</i> sample, spots were smaller but more numerous, and a large portion of the head and dorsum was black; 2) <i>klauberi</i> has larger but far less numerous spots that cover a greater portion of the dorsum and head. On average, substrate in <i>klauberi</i> habitats had an equal amount of dark and light ground cover. The ground cover in Sequoia was different from that in <i>klauberi</i> habitats, with an average 66.7% of the ground covered by dark soil. Within-group analysis of <i>klauberi</i> revealed morphological variations between the 3 sampled populations.</p> <p><b>Conclusions/Discussion</b> The results support the hypothesis that the blotches of <i>Ensatina</i> are cryptic. In <i>platensis</i> habitat, the ground was covered at 66.7% by a dark tone. The predominately dark dorsum of <i>platensis</i> means it blends in with this sort of substrate. In <i>klauberi</i> habitat, large light-colored oak leaves covered 49.3% of the ground. Following this pattern, <i>klauberi</i> has large spots and up to 36 % of its dorsum covered by light coloration.</p>	
<b>Summary Statement</b> The research investigates the cryptic value and geographic variation in the dorsal color pattern of the salamander species <i>Ensatina klauberi</i> .	
<b>Help Received</b> Andrew Stoehr, graduate student at the University of California at Riverside, taught me how to use the Image Analysis Program.	