

Intel ISEF Year of Abstracts: **2009**
Last Name to Limit to: **Joachim**
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Order by Category

2009 - AS053

IDENTIFYING HABITATS OF POISON DART FROGS: LOCAL ENVIRONMENT AND FROG DISTRIBUTION

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All over the world frogs are dying off at an alarming rate. Consequently herpetologists worldwide are rushing to conserve the frog species by putting them into sanctuaries. The purpose of my project is to understand two particular species of frogs so we might better conserve them. From 2004-2008 I began a longitudinal study censusing two species of poison dart frogs in Costa Rica. In addition more recently I have begun to pinpoint the combination of factors that lead to the distribution of frogs in certain habitats. Based on my own previous work I hypothesize that Dendrobatids will prefer interior undisturbed areas of the forest with high bio-diversity, particular temperature, and unpolluted soil with high relative humidity. My hypothesis is based on my 2007 results on biodiversity as well as the physiology of frogs. In particular, because frogs are poikiothermic and breath through there skin I assume that they will be sensitive to changes in temperature, relative humidity and soil characteristics. Results suggest that frogs prefer Riverine Disturbed and Interior Undisturbed habitats. A statistical comparison within and across forests showed a difference in temperature, Relative Humidity, biodiversity, and soil between frog and no frog areas. I suggest that a combination of these factors influences frog presence; no one factor is solely responsible.

Intel ISEF Year of Abstracts: **2010**
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2010 - AS044

USE OF REGRESSION ANALYSES TO BUILD ECOLOGICAL MODELS OF POISON DART FROGS IN THEIR NATIVE HABITATS

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All over the world frogs are dying off at an alarming rate due to pollution, global warming, deforestation, Chytrid fungus, and habitat destruction. Any conservation efforts must take into account ecological variables important to frog survival. The purpose of the current study is to model the ecological complexity of *Dendrobates pumilio*, *Dendrobates auratus*, and other diurnal frogs in the lowlands of Costa Rica for purposes of conservation. *Dendrobates pumilio*, *D. auratus*, and other diurnal frogs were censused at Estacion Biologica El Zota in the summer of 2009. Biotic and abiotic factors thought to contribute to frog presence were measured. These factors were: microclimate (temperature and RH) and biodiversity (prey, predators, buttresses, nursery plants, other animals, leaf litter depth, tree diameter, and habitat). Results of Student t-tests showed that *D. auratus* and *D. pumilio* could be found in areas of significantly different temperature and relative humidity. Weak correlations were found between frog presence and a composite score for biodiversity. Correlations between biotic and abiotic factors were low; but showed important relationships within the ecosystem. Binary logistic regression analyses were run on all frog data revealing one partial model (other diurnal frogs) and one successful model (*D. pumilio*). Predictors for the *D. pumilio* model are mean leaf litter, edge and riverine habitats, percent cover, presence of other diurnal frogs, and buttresses. The model for other diurnal frogs showed that habitat and presence of other frogs were the principal predictors of frog presence; but for mathematical reasons did not get included in the model. These models can be used to target sites preferred by frogs for conservation efforts.

Awards won at the 2010 ISEF

Trip to attend the China Adolescents Science and Technology Innovation Contest in August. - China Association for Science and Technology (CAST)
Intel ISEF Best of Category Award of \$5,000 for Top First Place Winner - Animal Sciences - Presented by Intel