

### **HSI Student Research Grants funded from 2005 to present:**

**2005. Dhanya Arunan**, College of Agriculture, Kerala, India was awarded \$250 for her project “Standardization of *in-vitro* pollination and fertilization techniques for *Heliconia*.” Ms. Aruna proposed standardizing techniques for *in-vitro* pollination and fertilization to facilitate a hybridization program. Three selected varieties of *Heliconia psittacorum* were utilized in this study, which focuses on establishing a viable protocol for *in vitro* pollination and fertilization techniques. This protocol is expected to be useful for hybridization programs in *Heliconia*. Funding was used to cover laboratory supplies and reagents. Results were published in the HSI Bulletin 14(2): 1-3. (2008).

**2005. David Matagala**, University of Miami, Florida was awarded \$500 for his research project titled “Cost of reproduction and pollinator limitation in the clonal herb, *Calathea marantifolia* (Marantaceae)”. Mr. Matagala’s dissertation research addressed the importance of sexual and asexual reproduction in the understory herb *Calathea marantifolia* across a range of light environments. Experimental and observational techniques were used to determine the advantages of each reproductive mode at the individual and populational levels. The research was the first to investigate the importance of seeds and ramets for population growth and spread by incorporating data on demography and dispersal in a mathematical mode. Experiments were conducted at the individual level to investigate the cost of reproduction and physiological integration between ramets. Reproductive allocation was quantified in different light environments and the morphology of ramet development was described. Funding was used to cover airfare and station fees.

**2005. Yari Castrellon**, Universidad de Panamá was awarded \$500 for her research project titled: “Study of the genetic diversity of selected Panamanian *Heliconia* species in the Section *Barbatae* using RAPD markers.” Ms. Castrellon’s thesis research focused on a genetic analysis of a complex of Panamanian *Heliconia* species in the Section *Barbatae* including *H. pogonantha* var. *pogonantha* and var. *veraguasensis*, *H. ramonensis* var. *ramonensis*, var. *lanuginosa*, var. *xanthotricha*, and var. *glabra*, *H. magnifica*, and *H. xanthovillosa*. Funding was used to cover laboratory supplies and reagents.

**2006. C. R. Reshmi**, College of Agriculture, Kerala, India was awarded \$500 for a project titled "Enhancement of propagation efficiency in exotic varieties of *Heliconia*". The research focused on studying techniques for rapid multiplication of three varieties making the production of planting material in large numbers in limited time possible. This study aimed to achieve this goal by *in vitro* as well as *in vivo* techniques. The *in vitro* propagation procedures were standardized for the production of disease-free planting material. *In vivo* study focused on the enhancement of sucker production and its intensification which could solve the increasing demand of planting material of exotic and novel varieties which are costly. The three varieties studied were: *Heliconia psittacorum* 'St. Vincent Red', *H. chartacea* 'Sexy Pink', and the hybrid group *Heliconia* 'Pedro Ortiz'. Results were published in the HSI Bulletin 15(3): 14 (2009).

**2007. Vinita Gowda**, graduate student at The George Washington University, was awarded \$500 to help fund her project titled: “Nectar study of two native Caribbean heliconias (*Heliconia*: Heliconiaceae) pollinated by sexually dimorphic Purple-throated Carib hummingbirds.” Ms. Gowda studied the nectar profiles in the two Caribbean heliconias *H. bihai* and *H. caribaea* on the islands of St.Kitts, Dominica, and St.Vincent. Given that these two *Heliconia* species have sex-specific pollination systems—they are pollinated by sexually dimorphic Purple-throated Carib hummingbirds—her field work focused on whether they have similar nectar profiles on the three islands. Funding covered transportation, accommodations, and other field expenses. Results were published in the HSI Bulletin 14(4): 14 (2008).

**2008. Madelaine Bartlett**, University of California, Berkeley was awarded \$500 for her Ph.D. dissertation project titled “Evolution of Floral Symmetry in the Zingiberales.” She collected floral material from as many Zingiberales taxa as possible at Lyon Arboretum and the National Tropical Botanical Garden in Hawaii and stored them in RNAlater solution, subsequently extracting the RNA at Berkeley to use in her study of floral symmetry. She also established a library of Zingiberales floral material, as the tissue is stable in RNAlater indefinitely if stored at -80°C. This library could be used in the future by researchers investigating questions of floral biology in the Zingiberales. Funding was used to cover transportation and living expenses for the Kauai segment of the field work.

**2009. Nihad K. Shukoor**, Dept. of Pomology and Floriculture, College of Agriculture, Vellayani, Kerala, India was awarded \$500 for her Ph.D. dissertation project titled “Standardisation of spacing and nutrient management for commercial production of Heliconias”. Her study aims to standardize a practices and recommendation for enhancing production and quality of flowers of various *Heliconia* cultivars and species for commercial cultivation under Kerala conditions. It also aims at comparing the flower quality and vase life of flowers grown purely organically and in an integrated way, thereby standardizing organic and inorganic practices with recommendation for growers. The stage of harvest of flowers with more vase life and flower production will also be studied.

**2012. Carlos Garcia-Robledo**, Postdoctoral Fellow at the Smithsonian Institution’s Department of Botany, National Museum of Natural History, was awarded \$500 for his research project titled “Developing molecular techniques to elucidate plant-herbivore interactions between Zingiberales and rolled-leaf beetles in a tropical rain forest.” His research focuses on developing and testing novel molecular techniques to identify plant-herbivore associations in one of the oldest and most conservative plant-herbivore interactions, plants from the Zingiberales and the rolled-leaf beetles (genera *Cephaloleia* and *Chelobasis*, Chrysomelidae).