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2004 Alwyn Gentry Award

The Alwyn Gentry Award was established to recognize outstanding student papers presented at the annual meeting of the Association for Tropical Biology and Conservation. This year, at the Miami meeting, 55 oral presentations and 31 posters were enrolled in the Gentry competition. We are proud to announce the winners of this year's awards. Nathan Muchhala received the award for his oral presentation entitled "The role of pollinators in the evolution of floral morphology: bats, birds, and *Burmeistera*." The best poster award goes to Carlos Garcia-Robledo and Floria Mora-Kepfer for their poster on "Assymetric pollen flow and morph reproductive function in the distylous herb *Arctophyllum lavarum*." Both winners are students in the Department of Biology at the University of Miami. The winners will receive a year's subscription to Biotropica, a cash award from ATBC, a book grant from the University of Chicago Press, and an honorarium to recognize their efforts. On behalf of the ATBC, I wish to congratulate them all.

S. Joseph Wright (Chair, Alwyn Gentry Award Committee)

MUCHHALA, NATHAN C.*, University of Miami, Department of Biology, n_muchhala@yahoo.com, **The role of pollinators in the evolution of floral morphology: Bats, birds, and *Burmeistera*.** As outlined in various descriptions of pollination syndromes, floral traits such as color, odor, and nectar production are commonly associated with pollination by particular floral visitors. However, the actual selective pressures responsible for these traits have rarely been confirmed. Floral morphology is one trait which is likely to be heavily influenced by pollinators, as the fit between floral visitor and flower is crucial to successful transfer of pollen. The stigma and anthers of species of *Burmeistera* have a variety of different exsertion lengths, which when graphed demonstrate a bimodal distribution; that is, species can be classified as either long- or short-exserted. This study is designed to test three hypotheses which may account for this bimodal distribution: 1) Adaptation to pollination by two different species of bats, 2) Adaptation to bats (long-exserted) or bats and hummingbirds (short-exserted), 3) Adaptation to partition the bodies of the pollinators. Methods include filming flowers, measuring pollen deposition on stigmas, and capturing visitors to examine pollen loads. Results support the third hypothesis; different bat species pollinate both flower types equally well, and hummingbirds do not effectively pollinate either type. Pollen loads of each type are deposited in different locations on bats heads. Flight cage experiments were used to verify the importance of niche partitioning. Bats were presented with four flowers simultaneously: one male- and one female-phase for each type. Examination of pollen deposited on the female-phase flowers showed that they received significantly more conspecific grains. The greater the difference in stigma exsertion, the less heterospecific pollen transfer occurred. Potential costs associated with sharing a pollinator include stigma blockage with heterospecific pollen and loss of pollen to heterospecific stigmas. For sympatric species of Burmeistera, results suggest selective pressures favor diverging in pollen placement in order to alleviate these costs.

GARCIA-ROBLEDO, CARLOS and MORA-KEPFER, FLORIA, Department of Biology, University of Miami, carlos@bio.miami.edu, **Asymmetric pollen flow and morph reproductive function in the distylous herb *Arcytophyllum lavarum* (Rubiaceae).** Distyly, the reciprocal positioning between stigmas and anthers in different flowers promotes dissassortative pollen flow between floral morphs. However, one of the morphs may play a primary role as male or female. If this asymmetry in the partitioning of reproductive functions increases, distyly could be a step towards the evolution of dioecism in plants. We performed this research at 3500 m elevation in Costa Rica, Cordillera de Talamanca, Cerro de La Muerte. We study *Arcytophyllum lavarum* (Rubiaceae), a distylic plant endemic to the paramos of Central America. This plant develops long-styled (pin) and short-styled (thrum) flowers. In this population, the pin morph is more abundant ($\chi^2 = 111.8$, df = 1, $N_{\text{pin total}} = 1676$, $N_{\text{thrum total}} = 1117$, $P < 0.001$). Thrum flowers produced more seeds than pin flowers, indicating a greater female reproductive success in thrums (Mean $\pm$ $SD_{pin} = 0.71 \pm 0.94$, Mean $\pm$ $SD_{thrum} = 1.87 \pm 2.26$, t = 34,

$N = 20$, $P = 0.04$). We emasculated all flowers in pin and thrum patches ($N = 20$) and measured the number of pin and thrum pollen arriving to recently open flowers. The amount of pollen that arrived at thrum flowers was higher than in pin flowers (Mean $\pm$ SD_{pin} = 13.6 $\pm$ 8.2, Mean $\pm$ SD_{thrum} = 31.3 $\pm$ 17.6, Mann-Whitney, $P < 0.05$). The probability of pollen arrival (Mean $\pm$ SD_{pin} = $1.4 \times 10^{-3} \pm 9 \times 10^{-4}$, Mean $\pm$ SD_{thrum} = $2.1 \times 10^{-3} \pm 1 \times 10^{-3}$) and the efficiency of dissassortative pollination (Mean $\pm$ SD_{pin} = -0.25 ± 0.42, Mean $\pm$ SD_{thrum} = 0.16 ± 0.25) were also higher in thrum flowers (MannWhitney, $P < 0.05$). In this population, thrum morph has a major role in seed production as a consequence of having higher efficiency of dissasortative pollination and probability of pollen arrival. Pin morph had higher male reproductive success. Therefore, in this population, floral morphs divide reproductive functions, the thrum morph acts to some degree more as a pistillate flower and pin morph more as staminate flowers.