

The Palmetto

**A Bog by
the Highway**

**Unique Flora
Faces an
Uncertain Future**
Pages 2 and 6



**American Black
Nightshade**

**The Wildflower
Garden Series**
by Rufino Osorio
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This is an older pdf file -- it has formatting problems when printed with current software.

FNPS Research Endowment Program: a Sample of Projects from 2003-2004

THE FLORIDA NATIVE PLANT SOCIETY has an established Research Endowment Program which every year funds a small number of modest grants to support scientific native plant research. The FNPS Science Advisory Board has worked with a number of excellent graduate students, faculty, and other science professionals on these projects. The following are excerpts from proposals funded by the Research Endowment Program during the past two years.

2003 Endowment Awards

Demography and Phenology of the Endangered Fern, *Ophioglossum palmatum*, at the Tosohatchee State Preserve

Eliane Norman, Professor emeritus, Stetson University and Sandra Carnival, Field Biologist, Tosohatchee State Preserve

and enable researchers to relate phenological patterns in leaf growth, spike production, and maturation to seasonal variation at the Tosohatchee State Preserve. The tasks include:

1. Locate host trees previously identified as bearing *Ophioglossum palmatum*. Note number of ferns per palm and locate side(s) of tree where grows, height at which it grows and any signs of fire.
2. Survey for additional host trees and collect above data.
3. Monitor, on a monthly basis, temperature, relative humidity, and light available at three different locations where the ferns are found. Obtain monthly rainfall data.
4. Study the growth pattern of one hundred hand ferns, selected randomly from different sites. Each plant as well as each leaf will be tagged. The following parameters will be measured or observed four times a year: length of stipe, length and width of blade, number of lobes, number of fertile spikes, size of fertile spike and stage of maturation, and percent of damaged leaves.

The *Illicium parviflorum* Michx. ex Vent. (ILLICACEAE) Paradox: an Endangered Florida Endemic and its Role in the Horticultural Trade

Ashley B. Morris, Department of Botany, University of Florida and
Pamela S. Soltis, Florida Museum of Natural History

This rare species is quite popular in the horticultural trade, and is commonly sold as far north as North Carolina and as far west as Arkansas. It is common practice in plant nurseries to increase their inventories by propagating cuttings, resulting in a genetically homogeneous stock. In addition, many nurseries obtain their original cuttings from the same source, resulting in homogeneity among nurseries. Such practices may have serious consequences for natural populations exhibiting self-incompatibility.

The goal of this study is to assess levels of genetic diversity in natural populations of *I. parviflorum*, as well as that of horticultural stocks. This information can then be used to determine the feasibility of the introductions outlined above.

The Genetics of Gender Flexibility in Passionflower

Cindy Bennington, Associate Professor of Biology, Stetson
University

The purpose is to test ideas related to the evolution of andromonoecy in
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passionflower by examining the response of gender expression to resource limitation (imposed through herbivory) in 64 plants from 16 distinct populations grown in pots in an experimental array. There are three main questions which will be addressed:

1. Is fruit production limited by the number of cosexual flowers produced by a plant? By describing the relationship between the number of hermaphrodite flowers and number of fruits produced, determine the extent to which fruit production is limited by whole-plant female function.
2. Is there genetic differentiation among populations in the proportion of male flowers per plant? Based on previous research and observations, extant populations are expected to harbor individuals that differ in the proportion of male flowers produced by individuals when plants are grown under similar conditions.
3. Is there genetic differentiation among populations in the degree to which floral gender is influenced by the environment? Genetic differences among populations may be fixed or plastic. Plastic genetic differences exist when individuals respond differently (in direction and/or magnitude) to some environmental variable.

Effects of Invasive Exotic Trees on the Seedling Demography of the Endangered Bromeliad, *Catopsis berteroniana*

Philip A. Gonsiska, Florida International University

South Florida is subject to invasion by exotic species, such as Australian pine (*Casuarina* spp.), Brazilian pepper (*Schinus terebinthifolius*), and melaleuca (*Melaleuca quinquenervia*). These species have the capacity to invade habitats, such as mangrove and buttonwood communities (Hammer undated), where *Catopsis berteroniana* is found. Since Australian pine, Brazilian pepper, and melaleuca have the capacity to exclude native vegetation in the habitats they invade, if they are less suitable epiphyte hosts than native tree species, the possibility exists for the decimation of Florida's epiphyte communities. This could result in the extirpation of endangered epiphytes such as *C. berteroniana*.

The purpose of the observational portion of this project is to determine the fate of *C. berteroniana* seedlings during their first year of life on their naturally occurring native host species. The experimental portion of this study will determine the effects of host species on seedling recruitment and thereby demonstrate potential effects of invasive woody species on bromeliad communities in south Florida.

Demography and Ecology of *Paronychia chartacea*

Jenny Schafer, Intern, Archbold Biological Station

Disturbed firelanes provide an open, unstable, and less fire-dependent habitat for many scrub endemics. Some species show different demographic trends between populations in natural scrub habitats and firelanes (Quintana-Ascencio et al., in preparation). *Paronychia chartacea*, papery whitlow-wort, is a state endangered and federally threatened plant endemic to Florida. This project will determine the effects of time-since-fire on growth, reproductive output, and seedling recruitment of *P. chartacea* ssp. *chartacea*. Quarterly demographic data will be collected for comparison of populations of the species in rosemary scrub and firelanes.

2004 Endowment Awards

Evaluation and Conservation of a Threatened Carnivorous Plant, *Pinguicula ionantha*, Godfrey's Butterwort

Herbert 'Tug' Kesler, Dept. Biological Sciences, Auburn University

Pinguicula ionantha R. K. Godfrey (LENTIBULARIACEAE) is a recently described species endemic to a 25 mile radius in the panhandle of Florida. Due to its shrinking population size, *P. ionantha* was listed as threatened by the United States Fish and Wildlife Service on July 12, 1993 and is currently listed as Florida State endangered. In this study, we propose to conduct field and laboratory experiments to gain information needed to conserve federally threatened *P. ionantha* populations in the panhandle of Florida. The results of both types of research will be integrated to create a better understanding of 1) the current status of all 62 known populations, 2) how the survival and fecundity of wild *P. ionantha* populations are directly effected by prescribed fire, and 3) whether a soil seed bank exist for this species. The goal of the project is to develop recommendations for conservation and management practices that will ensure the long-term survival of federally threatened and Florida endangered *Pinguicula ionantha* populations.

Trophic Cascades: Influences of Herbivory and Predation Influence on Post-Fire Succession

Tania Kim, University of Florida, Department of Zoology

The direct effects of prescribed fire on plant communities have been extensively studied yet little is known about the effects of fire on other trophic levels and trophic interactions. Interspecific interactions, such as herbivory and predation, play important roles in maintaining ecosystem function, however very little is known about their roles in post-fire succession. Predators may indirectly benefit plant communities by alleviating intense herbivory pressures typically associated with post-fire habitats. If predator top-down controls are strongly felt by plant communities, then herbivory and predation play extremely important roles in post-fire succession.

The goal of this research project is to determine whether insect herbivores and vertebrate predators play significant roles in influencing plant growth and reproduction following fire in longleaf pine sandhills. The project will set up insect herbivore and vertebrate predator exclosures in longleaf pine sandhill habitats throughout two reserves in north-central Florida.

Morphological and Molecular Systematics of the *Tillandsia fasciculata* (BROMELIACEAE) Complex: Biogeographical and Evolutionary Implications

Brian J. Sidoti, M.S. Graduate Student, Department of Biological Sciences, Florida International University

The purpose is to gain greater insight into the speciation and radiation of species within the *Tillandsia fasciculata* (BROMELIACEAE) complex that occur in Florida and Cuba. Specifically, anatomical, morphological, and molecular studies will be used to examine the *T. fasciculata* complex in order to support taxonomic decisions and species boundaries. Baseline data can then be used to construct and solidify conservation measures.