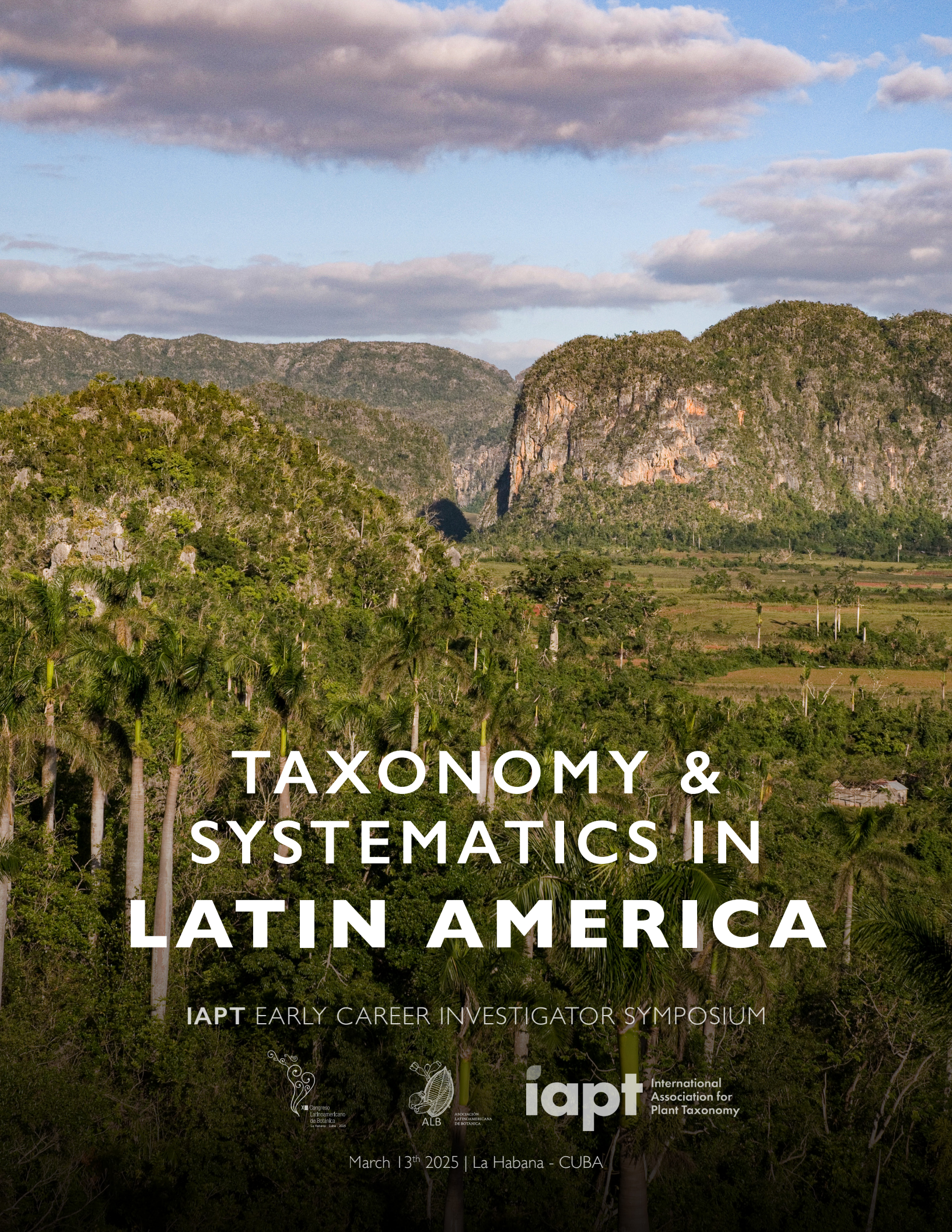


TAXONOMY & SYSTEMATICS IN LATIN AMERICA

IAPT EARLY CAREER INVESTIGATOR SYMPOSIUM

XI Congreso Latinoamericano de Botánica
La Habana - Cuba - 2025

ALB
ASOCIACIÓN LATINOAMERICANA DE BOTÁNICA

iapt International Association for Plant Taxonomy

March 13th 2025 | La Habana - CUBA

TAXONOMY & SISTEMATICS IN LATIN AMERICA

EARLY CAREER INVESTIGATOR SYMPOSIUM

XIII Congreso Latinoamericano de Botánica
La Habana · Cuba · 2025

ALB
ASOCIACIÓN LATINOAMERICANA DE BOTÁNICA

iapt International Association for Plant Taxonomy

March 13th 2025 | Habana - CUBA

A note from IAPT president

The International Association for Plant Taxonomy (IAPT) supports scientific research and scholarship in the field of systematics, including the taxonomy and evolution of plants, fungi, and algae. The IAPT is pleased to join the Red Latinoamericana de Botánica (RLB) at their XIII Congresso Latinoamericano de Botânica in Habana, Cuba.

At this conference, the IAPT is hosting the symposium entitled "Taxonomy & Systematics in Latin America." This symposium is part of the "IAPT Early Career Investigator Symposium" series that began at the XII Latin American Botanical Congress in Quito (Ecuador) back in 2018. This symposium series aims to highlight the work of young botanists, mycologists, and phycologists who are conducting groundbreaking research on important topics in our field. Each year the symposium is presented as part of the program of botanical conferences worldwide, covering a variety of cutting-edge themes in our field.

Welcome to the IAPT Early Career Investigator Symposium!

Lúcia G. Lohmann
President of IAPT

Cover photo
Viñales Valley in the Sierra de los Órganos (photo: Fabián A. Michelangeli).

CONTENTS

PLASTOME PHYLOGENOMICS OF THE DIVERSE NEOTROPICAL ORCHID GENUS *LEPANTHES*

Tatiana Arias

Plastome phylogenomics of the diverse neotropical orchid genus *Lepanthes*

Tatiana Arias

Fundacion Orquideas para la Paz

tatianaarias@orchidsforpeace.org

Key words: Andes, Chloroplast, genome skimming

The phylogenetic relationships within *Lepanthes*, a highly diverse miniature orchid genus in the Neotropics, have remained unresolved until this study. Using living collections and publicly available data, we examined major taxonomic groups, evolutionary lineages, and biogeographic origins. We applied genome skimming to sequence 10 chloroplast genomes, recovered up to 86 plastome coding genes from GenBank, and amplified matK and rITS genes for 26 species. The chloroplast genomes (~157,185–158,260 bp) contained 136 genes, and six hypervariable regions, including parts of ycf1, were identified as potential DNA barcodes. Our findings revealed that Carl Luer's subgeneric groups are not monophyletic, highlighting morphological homoplasy. Six evolutionary clades were identified, although the phylogeny's backbone remains unresolved, requiring nuclear markers for further clarity. Two *Marsipanthes* species (*L. attenboroughii* and *L. caprimulgus*) are closely related to East Andean Lepanthes species, suggesting ancestral origins in southern Ecuador or northern Peru, followed by Andean dispersal. PCA analysis showed sepal dimensions are key for species differentiation. Despite limited species sampling, this study captures significant taxonomic, geographic, and morphological diversity, offering initial insights into *Lepanthes* evolution. Our results provide a foundation for future research using the molecular tools identified here.

Tatiana Arias

Orchids for Peace
Calle 71sur 34 314
Sabaneta, Colombia

tatianaarias@orchidsforpeace.org

Tatiana Arias is a classically trained botanist who has kept up with modern methods. She has more than 15 years of experience working in plant sciences and sees herself contributing to the understanding of the diversity and evolution of neotropical epiphytic orchids. She has a PhD in Biological Sciences from the University of Missouri and had a two-year postdoctoral fellowship at The University of Hong Kong. She has also worked as research botanist at Marie Selby Botanical Gardens in Sarasota, Florida, and the Scientific leader of The Center of Biological Research (CIB) in Medellin, Colombia. She taught in several universities in Colombia for seven years. The main goal of her research is to integrate multiple disciplines such as systematics, genomics, collection-based research, and natural history. This integrative approach allows her to test hypotheses about key biogeographical, morphological, and functional traits that have given rise to this spectacular diversity. All the outcomes will be key to inform strategies that allow to preserve orchids.

Cover photo
Lepanthes manabina Dodson *(Photo: Tatiana Arias)*

ANTILLES: A "STEPPING-STONE" FOR THE TRANSATLANTIC CROSSING BY SPECIES OF *MUCUNA* ADANS. (LEGUMINOSAE–PAPILIONOIDEAE)

Tania M. De Moura

Antilles: a "stepping-stone" for the transatlantic crossing by species of *Mucuna* Adans. (Leguminosae–Papilionoideae)

Tania M. De Moura

Instituto Federal de Educação, Ciência e Tecnologia Goiano, Campus Urutai Rod. Geraldo Silva Nascimento 5, km. 2, Urutaí, Goias. Brazil. Zip Code 75790-000

tania.moura@ifgoiano.edu.br

Key words: Dispersão, Fabaceae, Lianas

The objective of this study is to analyze the distribution pattern and phylogenetic inferences for *Mucuna*, and to understand the role of the Caribbean islands in the transoceanic dispersal of some of its taxa. We assume that all six species of *Mucuna* occurring in the Antilles colonized this archipelago from the American continent. Two taxa, representatives of the typical subgenus, dispersed via the Atlantic Ocean to Africa: *M. sloanei* and the ancestor of *M. flagellipes*. *Mucuna sloanei*, in addition to being distributed throughout the Neotropical region, also occurs in several Pacific islands, in the Antilles, and in Africa, emphasizing its potential for transoceanic dispersal. *Mucuna flagellipes*, endemic to Africa, shows morphological and molecular similarity with *M. urens* (which occurs in North and South America and the Caribbean), allowing us to suggest a recent common ancestor of Neotropical origin for these two taxa. In this case, the islands that make up the Antilles acted as "stepping stones" for the colonization of the West African coast by representatives of *M.* subg. *Mucuna*. *Mucuna pruriens* is the only representative of *M.* subg. *Mucuna* outside the Paleotropics; however, its introduction to the Neotropical region and the Antilles was likely the result of human intervention.

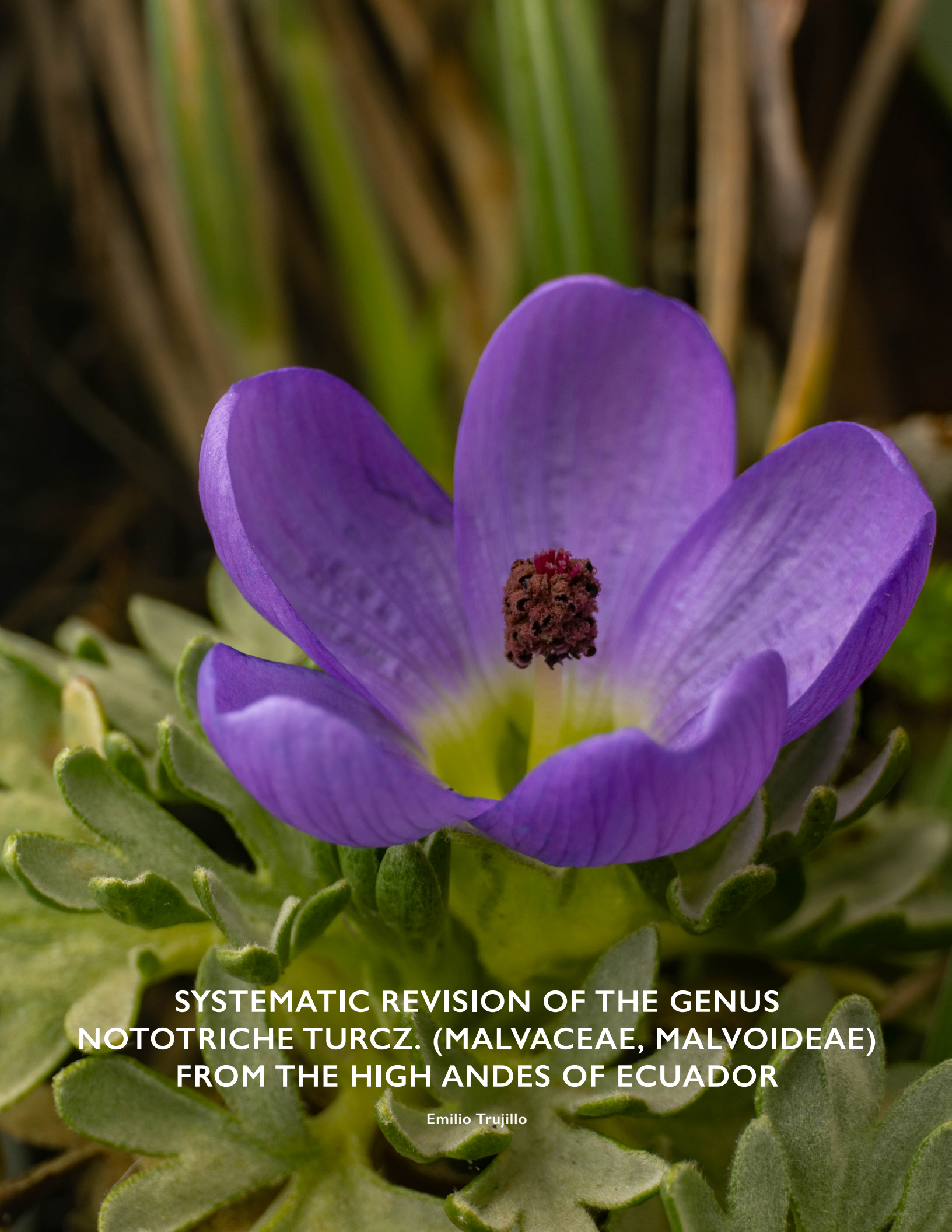
Tania M. De Moura

Instituto Federal de Educação, Ciência e Tecnologia Goiano, Campus Urutai
Rod. Geraldo Silva Nascimento 5, km. 2,
Urutaí, Goias. Brazil. Zip Code 75790-000,

tania.moura@ifgoiano.edu.br

I hold a Ph.D. in Plant Biology from UNICAMP (Brazil) and completed a postdoctoral fellowship at the Royal Botanic Gardens, Kew. My research focuses on the Leguminosae family, with particular expertise in the genus Mucuna. I am currently a professor at the Federal Institute of Education, Science and Technology of Goiás, Urutaí Campus, Brazil.

Cover photo
Mucuna sloanei Fawc. & Rendle *(photo: Tania M. de Moura).*



SYSTEMATIC REVISION OF THE GENUS NOTOTRICHE TURCZ. (MALVACEAE, MALVOIDEAE) FROM THE HIGH ANDES OF ECUADOR

Emilio Trujillo

Systematic revision of the genus *Nototriche* Turcz. (Malvaceae, Malvoideae) from the high Andes of Ecuador

Emilio Trujillo

Herbario QCA, Escuela de Ciencias Biológicas, Facultad de Ciencias Exactas y Naturales, Pontificia Universidad Católica del Ecuador, Av. 12 de Octubre 1076 y Vicente Ramón Roca, 170525 Quito, Ecuador

ejtrujillo@puce.edu.ec

Key words: Andes, evolution, lectotypification, Malvoideae, phylogeny, taxonomy, nomenclature

Alpine ecosystems are distributed across all continents above the tree-line ecotone, characterized by extreme climatic conditions and a unique biodiversity specially adapted to these environments. In the high Andes of Ecuador, we find the páramos, considered the most biodiverse alpine ecosystem in the world, hosting approximately 1,735 vascular plant species with high levels of endemism and speciation. *Nototriche* Turcz. (Malvaceae, Malvoideae) is a genus comprising around 106 species distributed throughout the high Andes of South America, exhibiting high radiation and diversity in extreme environmental conditions. Despite its broad distribution, the genus remains largely understudied, lacking sufficient taxonomic, nomenclatural, ecological, and molecular research. In Ecuador, the known species have only undergone two taxonomic revisions, with no ecological, molecular, or evolutionary data available. This study represents the first systematic approach to this species complex, aiming to unravel its evolutionary history and improve our understanding of the group. Here, we conducted a taxonomic revision, including nomenclatural updates, the designation of four lectotypes for names associated with this group, and morphological measurements to develop new species descriptions and an identification key. Additionally, we present an ecological characterization, an updated distribution, and, for the first time, molecular data for *Nototriche* in the country, with phylogenetic trees addressing the genus. Furthermore, through an exhaustive morphological revision supported by molecular evidence, we are actually describing a new species recorded in the páramos of the Antisana volcano.

Emilio Trujillo

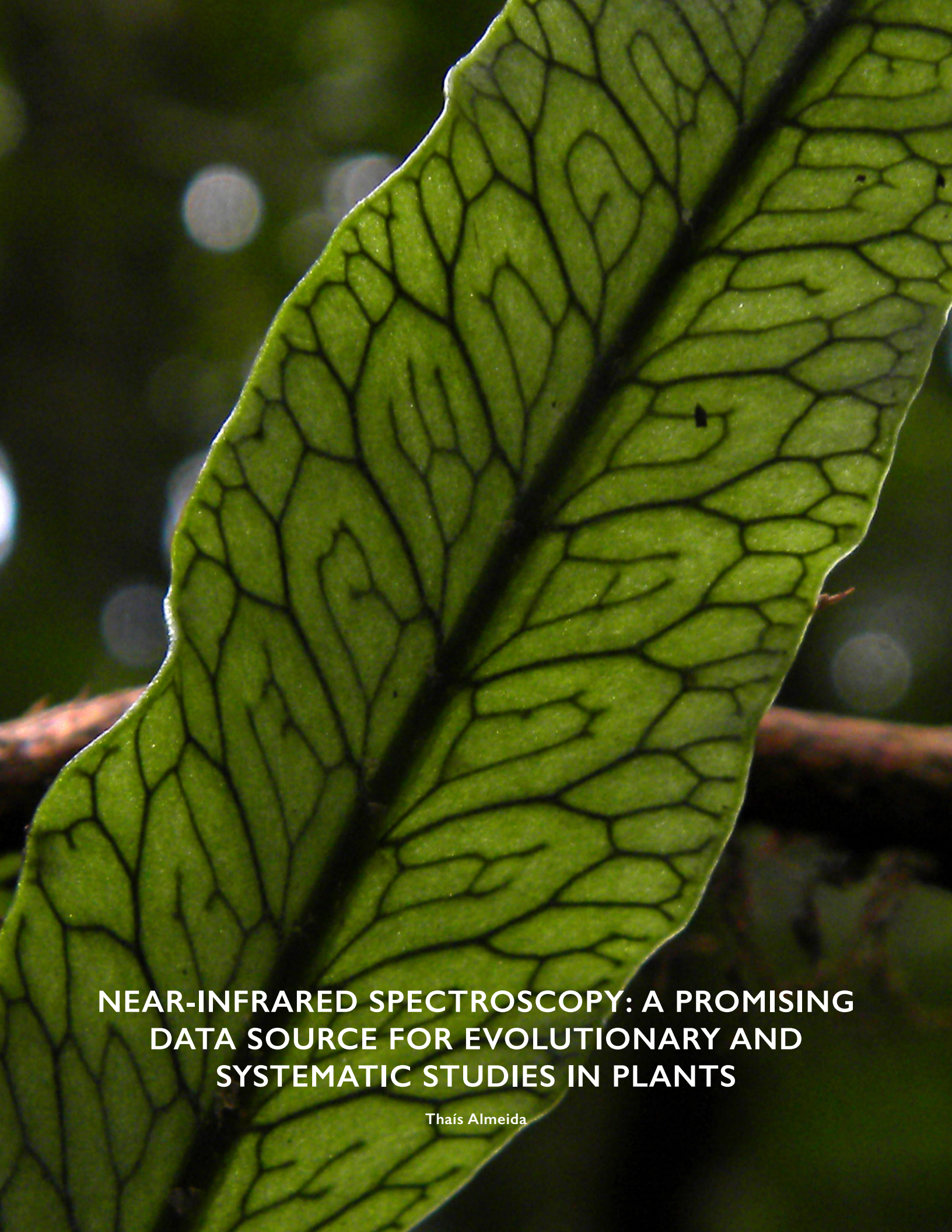
Herbario QCA, Escuela de Ciencias Biológicas, Facultad de Ciencias Exactas y Naturales, Pontificia Universidad Católica del Ecuador
Av. 12 de Octubre 1076 y Vicente Ramón Roca, 170525 Quito, Ecuador

ejtrujillo@puce.edu.ec

"I am a plant taxonomist and systematist affiliated with the QCA Herbarium at Pontificia Universidad Católica del Ecuador (PUCE), with a strong affinity for the high Andes and a particular interest in understanding the flora of the páramos. After years of studying the diverse ecosystems of my country, I became especially drawn to high Andean flora, which completely captivated me. In 2023, I initiated my first research project, focusing on the systematics of the genus Nototriche (Malvaceae, Malvoideae). This genus remains largely understudied, with many taxonomic and systematic challenges yet to be addressed. Since then, I have been involved in the taxonomy, ecology, cytology, and phylogenetics of this group and I am currently describing a new species based on morphological and molecular evidence.
My research interests focus on understanding the taxa of Andean ecosystems, contributing to biodiversity studies and generating valuable information for both the scientific community and society."

Cover photo

Nototriche phyllanthos (Cav.)A.W.Hill, a representative Ecuadorian species of the genus, found in several páramos of the country (photo: Erick Troncoso-López).



NEAR-INFRARED SPECTROSCOPY: A PROMISING DATA SOURCE FOR EVOLUTIONARY AND SYSTEMATIC STUDIES IN PLANTS

Thaís Almeida

Near-Infrared Spectroscopy: a promising data source for evolutionary and systematic studies in plants

Thaís Almeida

Universidade Federal de Pernambuco Departamento de Botânica, Centro de Biociências/UFPE, Av. Prof. Moraes Rego, 1235 - Cidade Universitária, Recife, PE, 50670-901, Brazil

thais.elias@ufpe.br

Keywords: *FT-NIR spectroscopy, ferns, predictive models*

Fourier Transform Near-Infrared Spectroscopy (FT-NIR) is a precise, efficient, and valuable technique for evolutionary and systematics studies. It involves exposing fragments of biological material (e.g., dry leaves) to electromagnetic radiation in the infrared range. Each sample's absorbance or reflectance spectrum represents a chemometric model derived from its C - H, C - N, and C - O bonds, reflecting its chemical and physical structure. It is a rapid, economical, and non-destructive analytical approach that provides better reproducibility without emissions or waste. FT-NIR spectra generate complex spectral signatures that can be utilized in many developmental, physiological, evolutionary, and systematic studies. Numerous studies have demonstrated that FT-NIR is accurate in identifying and describing botanical samples, with the majority of research focusing primarily on seed plants. Here, we present results showing the accuracy of FT-NIR datasets in recognizing species hypotheses from all lineages of spore-bearing vascular plants, including lycophytes and several lineages of ferns (Hymenophyllales, Gleicheniales, Schizaeales, Cyatheales, and Polypodiales). Additionally, we test whether FT-NIR data capture the underlying variation in groups with high morphological disparity or stasis and its potential as a tool for identifying cryptic species. Lastly, we investigate whether environmental occupation correlates with spectral variation in lineages.

Thaís Almeida

Universidade Federal de Pernambuco
Departamento de Botânica, Centro de Biociências/UFPE, Av. Prof. Moraes Rego, 1235 - Cidade Universitária, Recife PE, 50670-901, Brazil

thais.elias@ufpe.br

I am passionate about books, travel, and the fascinating evolution of plants, particularly ferns and lycophytes. Currently, I serve as a professor of Botany at the Universidade Federal de Pernambuco (UFPE) and in the Postgraduate Program in Botany at UFPE's Botany Department in Brazil, where I mentor students and guide their research. My research focuses on phenotypic and genomic evolution, biogeography, and systematics, with an emphasis on the diversity and evolutionary history of ferns and lycophytes, especially in tropical regions. My research group and I have made significant contributions to understanding the origins, diversification, and distribution patterns of these plant groups. Our research integrates field studies, molecular and phenotypic data (including morphometrics and spectral analyses), and computational modeling to explore the ecological and evolutionary processes driving plant biodiversity.

Cover photo
Microgramma squamulosa - RPPN Legado das Águas, Reserva Votorantim, São Paulo/Brazil (*Photo: Thaís Almeida*)

GENERIC DELIMITATION IN ANDROPOGONEAE (POACEAE): WHAT HAS BEEN RESOLVED AND WHAT STILL NEEDS TO BE DONE?

Cassiano A. Dorneles Welker, Michael R. McKain, Myriam Carolina Peichoto, Watchara Arthan, Maria S. Vorontsova, Elizabeth A. Kellogg

Generic delimitation in Andropogoneae (Poaceae): what has been resolved and what still needs to be done?

Cassiano A. Dorneles Welker[1], Michael R. McKain[2], Myriam Carolina Peichoto[3], Watchara Arthan [4], Maria S. Vorontsova[5], Elizabeth A. Kellogg[6]

[1]Universidade Federal de Uberlândia Rua Ceará s/n, Bloco 2D, Umuarama, 38405-302, Uberlândia, Minas Gerais, Brazil

[2]The University of Alabama, USA.

[3] Instituto de Botánica del Nordeste, Argentina.

[4] Mahidol University, Thailand.

[5] Royal Botanic Gardens, Kew, UK.

[6] Donald Danforth Plant Science Center, USA.

cassiano_welker@ufu.br

The tribe Andropogoneae (Poaceae: Panicoideae) is one of the most complex lineages among grasses, both morphologically and phylogenetically. Reticulate evolution and polyploidy are common in this group, as well as the lack of clear morphological discontinuities between taxa, which complicates the delimitation of its genera and species. Despite the great ecological and economic importance of Andropogoneae, many taxonomic uncertainties remain regarding the circumscription of genera within the tribe. Recent phylogenetic studies have shown that many traditionally accepted genera in Andropogoneae are para- or polyphyletic, requiring taxonomic rearrangements to ensure monophyly. Phylogenies based on plastome and nuclear data have contributed to the delimitation of some of these taxa, such as the recognition of *Tripidium* as a genus distinct from *Saccharum*. Similarly, *Anatherum* was recently reestablished and expanded to include about one-third of the species formerly accepted in *Andropogon*. Molecular phylogenies have also revealed that *Themeda* should incorporate at least a few species of *Heteropogon* to achieve monophyly. Future studies should focus on the delimitation of genera such as *Andropogon, Eulalia, Ischaemum, Mnesithea, Saccharum*, and *Schizachyrium*. Several changes in the circumscription of genera within Andropogoneae are expected in the coming years. (Funding: FAPEMIG, CNPq)"

Cassiano A. Dorneles Welker

Universidade Federal de Uberlândia
Rua Ceará s/n, Bloco 2D, Umuarama, 38405-302, Uberlândia, Minas Gerais, Brazil

cassiano_welker@ufu.br

I am a Professor at Universidade Federal de Uberlândia (Minas Gerais, Brazil), and my research focuses on the taxonomy and phylogeny of grasses, especially Andropogoneae and Neotropical bamboos. I use multiple methodologies to investigate plant systematics, evolution, and taxon delimitation, ranging from morphological to molecular approaches.

Cover photo

Inflorescence of Schizachyrium condensatum (Kunth) Nees, a representative of one of the Andropogoneae genera with an uncertain circumscription (photo: Cassiano A. D. Welker)..

REGIONALIZATION OF NEOTROPICAL AQUATIC PLANTS

Karina Fidanza

Regionalization of neotropical aquatic plants

Karina Fidanza

Universidade Estadual de Maringá Av. Colombo, 5790 - Jd. Universitário CEP 87020-900 - Maringá - PR - Brazil

karina@nupelia.uem.br

Key words: Biogeography; Bioregions; Macrophytes

Aquatic plants are essential to the biodiversity and functioning of wetland ecosystems, yet their biogeographic patterns in the Neotropics are poorly understood. This study investigates the regionalization of endemic vascular aquatic plants and identifies environmental factors shaping bioregion boundaries. Using over 90k occurrence records for 778 endemic species sourced from the Global Biodiversity Information Facility, we applied Infomap Bioregions, a network-based clustering method, to define bioregions. Scenarios were tested by varying the weight of rare species and incorporating phylogenetic information. The optimal scenario revealed 18 distinct bioregions, including major regions such as the Amazon, Guiana Shield, and Mesoamerica, as well as smaller zones that may help inform conservation actions. To explore drivers of these patterns, we developed a spatial autoregressive model including precipitation extremes, terrain ruggedness, and climate change velocity since the Quaternary. Precipitation extremes and terrain ruggedness are the most significant predictors of bioregion boundaries. These findings provide valuable insights into the high diversity and distribution of Neotropical aquatic plants, emphasizing the interplay between historical and environmental factors. This research offers a framework for understanding aquatic plant biogeography and contributes critical knowledge for conserving wetlands and their associated biodiversity in the Neotropics

Karina Fidanza

Universidade Estadual de Maringá
Av. Colombo, 5790 - Jd. Universitário
CEP 87020-900 - Maringá - PR - Brazil

karina@nupelia.uem.br

Karina Fidanza - pesquisadora do Núcleo de Pesquisas em Limnologia, Ictiologia e Aquicultura (Nupélia-UEM) - Laboratório de Sistemática e Biogeografia de Plantas - Programa de Pós-Graduação em Ambientes Aquáticos Continentais (PEA)

Cover photo
Nymphoides indica - reservatório Itaipu (Photo: Karina Fidenza)

NOTES ON SCANDENT-LEAVED SPECIES OF *AMAUROPELTA* (THELYPTERIDACEAE) IN COLOMBIA

David Sanín

Notes on scandent-leaved species of *Amauropelta* (Thelypteridaceae) in Colombia

David Sanín

Universidad Industrial de Santander, Carrera 27 calle 9, Bucaramanga COLOMBIA

dsanin@uis.edu.co

Key words: Andes, endemic ferns, páramo, *Amauropelta* sect. *Lepidoneuron*, *Thelypteris*

Amauropelta is the most diverse genus of Thelypteridaceae, comprising 233 species distributed across four recognized subgenera. Within these, *Amauropelta* subgen. *Amauropelta* includes *A.* sect. *Lepidoneuron*, characterized by scandent leaves and atropurpureous rachises. Species delimitation in this section has historically been problematic. Recent fieldwork in Colombian páramos has highlighted the need for two new combinations in *A.* sect. *Lepidoneuron*: *Cyathea sunduei* and *Dryopteris atropurpurea* are here transferred to *Amauropelta*. In addition, our study documents a new synonym and a new distribution record for *Amauropelta laevigata*, for which a lectotype is also designated from one of its synonyms. We provide detailed descriptions, line drawings, macro- and microphotographs, distribution maps, a key to the species treated, and preliminary conservation assessments for those restricted to Colombia.

David Sanín

Universidad Industrial de Santander,
Carrera 27 calle 9, Bucaramanga
COLOMBIA

dsanin@uis.edu.co

David Sanín is a fern systematist at the Universidad Industrial de Santander, Colombia. He specializes in the fern genus *Serpocaulon* (Polypodiaceae) and has extensive fieldwork experience in the Andes, the Chocó, and the Andean–Amazonian Piedmont of Colombia. His research interests include fern phylogeny, anatomy, and conservation.

Cover photo
Leaf of *Cyathea sunduei, a species soonk to be transferred (Photo: David Sanin)*