

**JUAN CARLOS VILLARREAL A.**

Department of Ecology and Evolutionary Biology  
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**EDUCATION**

**Ph.D. Biology**

Department of Ecology and Evolutionary Biology (EEB), UConn–Connecticut (advisor: B. Goffinet): 2006-May 2011 (expected)

Dissertation: Genetic and evolutionary consequences of the shift to asexuality in bryophytes: Insights from the Southern Appalachian hornwort *Nothoceros aenigmaticus*

**M.S., Plant Biology**

Department of Plant Biology, Southern Illinois University (SIUC)–Carbondale (advisor: K. Renzaglia): Dec. 2005.

Thesis: A comparative anatomical and ultrastructural study of two phylogenetically significant hornworts: *Leiosporoceros dussii* and *Phaeomegaceros fimbriatus*

**B.S., Biological Sciences**

Department of Botany, University of Panamá–Panamá (advisor: N. Salazar Allen): March 2003

Thesis: Estudio morfológico y anatómico del género *Megaceros* en Panamá

**AWARDS & FELLOWSHIPS**

**A.J. Sharp Award (American Bryological and Lichenological Society)**

Best student paper at the annual meeting of the American Bryological and Lichenological Society, Providence, RI, (\$500): 2010.

**Presidential Summer Graduate Research Award (UConn)**

A nomination-based award only given to five students among 60 nominated candidates. Summer support (\$5000): 2009.

**Doctoral Fellowship (UConn)**

A fellowship to support advanced graduate students (\$2000): 2009.

**Extraordinary Doctoral Travel Award.**

Graduate School, UConn (\$500): 2009

**The William Sullivant award– American Bryological and Lichenological Society**

Recognizing the best paper published in the *Bryologist* in the year 2007 for the paper entitled "Progress and challenges toward developing a phylogeny and classification of the hornworts".

**William Steere Foundation of the NY Botanical Garden.**

A two-week visit to the NY Botanical Garden: 2005.

**Botanical Society of America**

Graduate research award (\$500): 2004.

**Travel Award**

Southern Illinois University—Office of Research Development and Administration (\$1000): 2004.

**Organization of Tropical Studies and University of Costa Rica**

Fellowship to attend a graduate course (\$4000): 2003.

**Post-Course Research Award (Declined after acceptance in SIUC)**

Organization of Tropical Studies (\$500): 2003.

**Travel Award**

Corredor Biologico Mesoamericano del Pacífico Panameño (\$500): 2002.

**Travel Award**

Humboldt Field Research Institute.

**PUBLICATIONS IN PEER-REVIEWED JOURNALS**

**Most relevant papers**

Villarreal, J.C. & K.S. Renzaglia. 2006. Structure and development of *Nostoc* strands in *Leiosporoceros dussii* (Anthocerotophyta): a novel symbiosis in land plants. *American Journal of Botany* 93(5): 693-705. (Cover).

Villarreal, J.C. & K.S. Renzaglia. 2006. Sporophyte structure in the neotropical hornwort *Phaeomegaceros fimbriatus*: implications for phylogeny, taxonomy and character evolution. *International Journal of Plant Sciences* 167: 413-427.

Duff, R.J., J.C. Villarreal, D.C. Cargill & K.S. Renzaglia. 2007. Progress and challenges toward developing a phylogeny and classification of the hornworts. *The Bryologist*, 110: 214-243.

Villarreal, J.C., D.C. Cargill, A. Hargborg, L. Söderström & K.S. Renzaglia. (In press). Hornwort diversity: Patterns, causes and future work. *Phytotaxa*

**Other peer-reviewed publications**

Sérusiaux, E., J.C. Villarreal A., T. Wheeler & B. Goffinet (Accepted pending re-submission) Recent origin, active speciation and dispersal for the lichen genus *Nephroma* (Peltigerales) in Macaronesia. *Journal of Biogeography*

Villarreal, J.C.; B. Goffinet; R.J. Duff & D.C. Cargill &. (In press) *Phaeomegaceros squamuliger* subspecies *hassellii* (Dendrocerotaceae, Anthocerotophyta), a new taxon from the Southern Hemisphere. *Nova Hedwigia* 91 (3–4):000–000.

Villarreal, J.C.; B. Goffinet; R.J. Duff & D.C. Cargill &. 2010. Phylogenetic delineation of the genera *Nothoceros* and *Megaceros*. *The Bryologist* 113: 106-113.

Renzaglia, K.S., J.C. Villarreal & R.J. Duff. 2009. New insights into morphology, anatomy and systematics of hornworts. In *Bryophyte Biology II*, B. Goffinet & J. Shaw (eds), Pp 139-

171.

- Villarreal, J.C., G. Hässel de Menéndez & N. Salazar Allen. 2007. *Nothoceros superbus* (Dendrocerotaceae), a new species of hornwort from the Neotropics. *The Bryologist* 110: 279-285.
- Dauphin, G.; T. Pócs; J. C. Villarreal & N. Salazar Allen. 2006. Nuevos Registros de Hepáticas y Anthocerotófitas para Panamá. *Tropical Bryology* 27: 73-85.
- Cargill, D.C.; R.J. Duff, J.C. Villarreal & K.S. Renzaglia. 2005. Generic concepts in hornworts: historical review, contemporary insights and future directions. *Australian Systematic Botany* 18: 7-16.
- Duff, R.J.; D.C. Cargill, J.C. Villarreal & K.S. Renzaglia. 2004. Phylogenetic relationships of the hornworts based on *rbcL* sequence data: novel relationships and new insights. *Monographs in Systematic Botany from the Missouri Botanical Garden* 98: 41-58.

### **Edited publication**

- J.C. Villarreal; W. Frey & D.C. Cargill. 2010 (in press). Bryology in the Southern Hemisphere. *Nova Hedwigia* 91(3-4): 1–250 pp. (A list of contributed and peer-reviewed papers on biogeography, niche modeling, cryo-microscopy, floristics and evolution of Southern Hemisphere bryophytes).

### **Non peer-reviewed publications**

- Villarreal, J.C. 2010. Before the Vascular plants. Book review of "Syllabus of Plant Families A. Engler's Syllabus der Pflanzenfamilien. 3. Bryophytes and seedless vascular plants. 2009. Eds: Wolfgang Frey, Michael Stech & Eberhard Fischer. *The Bryologist* 113: 431–434.

### **RESEARCH EXPERIENCE:**

#### **Consultant**

- The Field Museum, Chicago–Biodiversity Synthesis Group–Encyclopedia of Life: May 2009  
Compiled and verified a worldwide checklist of hornworts and identification of biodiversity hotspots with scientists from New Zealand, USA and Australia.

#### **Visiting researcher**

- The Field Museum, Chicago (with K. Feldheim & M. von Konrat): June 2008.  
Developed microsattelites for *N. aenigmaticus*. Helped to develop a database on hornwort biodiversity.

#### **Research Assistant**

- Department of Plant Biology, Southern Illinois University (with K. Renzaglia): Fall 2003-2005  
Worked in a collaborative project funded by the National Science Foundation: Research, Biodiversity, Phylogeny and Biogeography of Hornworts. Responsibilities: gathering ultrastructural and anatomical data, collecting and culturing specimens, doing taxonomic work, preparing illustrations and writing papers.

#### **Intern**

- Smithsonian Tropical Research Institute (STRI), Molecular Biology Laboratory and Bryophyte Systematics, Panamá (with E. Bermingham and N. Salazar Allen): Spring 2003  
Learned PCR methods. Collected hornworts in Panama and Costa Rica.

## **Technical and Field Assistant**

Smithsonian Tropical Research Institute, Panamá (with N. Salazar Allen): 2001-2003  
Collected and databased bryophyte specimens from Panama and Costa Rica. Maintained bryophyte cultures.

University of Panamá & Autoridad del Canal de Panamá: June–July 2001  
Collected bryophyte and parasitic plant specimens during the environmental assessment of the canal expansion in three remote areas of Central Panama.

Smithsonian Tropical Research Institute, Panamá: April–May 2000  
Mapped and censused shrubs in the Knight-Lang Plot, Barro Colorado Island.

University of Panamá, National Herbarium, Panamá (with M. Correa)  
Collected and databased vascular plant specimens.

## **RESEARCH GRANTS:**

**Doctoral Dissertation Improvement Grant, National Science Foundation:** Genetic and evolutionary consequences of the shift to asexuality in bryophytes: Insights from the Southern Appalachian hornwort *Nothoceros aenigmaticus*. (\$9,454): June 2009-May 2011. Co-PI with B. Goffinet.

**Ronald Bamford Endowment Fund Research Grant, EEB, UCONN**  
Developed a microsatellite library, funded fieldtrip to D. Republic, funded transcriptomic work (\$3100): 2006–2010.

**Southern Appalachian Botanical Society**  
Funded exploratory fieldwork in Southern Appalachians (\$300): 2008.

**International Association of Plant Taxonomists**  
Funded preliminary lab work and field trip to Panama (\$1000): 2008.

**Smithsonian Tropical Research Institute**  
Funded exploratory project "Barcoding the Bryophytes of Panama". PI: L. Forrest, co-PIs: N. Salazar Allen and J.C. Villarreal (\$2000): 2008.

**International Association of Bryologists**  
Stanley Green Award (\$1000): 2007.

**Smithsonian Tropical Research Institute –Andrew W. Mellon Foundation**  
Fellowship to learn molecular techniques and do fieldwork in Panama (\$3000): 2002-2003.

## **TEACHING EXPERIENCE**

- I. Department of Ecology and Evolutionary Biology, University of Connecticut
  - Evolution of Green Plants* (course taught by L. Lewis and B. Goffinet): Spring 2010
  - Biology of Bryophytes and Lichens* (course taught by B. Goffinet): Spring 2009
  - Introduction to Botany* (course taught by P. Lewis and B. Goffinet): Fall 2006, 2007, 2009
  - Introduction to Biology* (course taught by A. Fry): Spring 2006, Spring 2008, Fall 2008.
- II. Department of Plant Biology, Southern Illinois University
  - Plant diversity* (course taught by S. Sipes): Fall 2004
- III. McGill University, City of Knowledge, Panamá

*Neotropical Environments* (taught by C. Potvin, H. Barrios and Y. Aguila): Jan. 2001  
*Social change in Panama* (taught by U. Locher): Feb. 2001  
*Environmental Management* (taught by T. Meredith): March 2001

## **COURSES**

Woods Hole Marine Laboratories, USA: August 2009  
*Workshop on Molecular Evolution* (organized by M. Cummings).

Universidad de Costa Rica & Organization for Tropical Studies (OTS), Costa Rica: 2003  
*Graduate course in Tropical Ecology and Conservation.*

Humboldt Field Research Institute & University of Maine, USA: June 2001  
*Biosystematics and ecology of temperate bryophytes* (taught by N. Slack and N. Miller).

## **INVITED RESEARCH PRESENTATIONS (\* Speaker):**

Villarreal, J.C. \*, K. McFarland & B. Goffinet. 2009. Diversification of the genus *Nothoceros* and Pleistocene origin of the Southern Appalachian *N. aenigmaticus*. *Early Land Plants Today/Encyclopedia of Life Meeting*. Field Museum, Chicago.

Villarreal, J.C. \*, K. McFarland, K.S. Renzaglia & B. Goffinet. 2009. Filogenia de los Antocerotes y tiempo de diversificación del género *Nothoceros*. V Congreso Colombiano de Botánica, Nariño, Colombia.

Villarreal, J.C.\*, R.J. Duff & K. S. Renzaglia. 2008. New insights into morphology, anatomy and systematics of hornworts. Department of Botany, The Field Museum, Chicago, USA.

Renzaglia, K.S., J.C. Villarreal, S. Schuette, J. Duckett\* & R. Ligrone. 2007. Evolution of the hornwort chloroplast unveiled. World Conference of Bryology, Malaysia. Invited lecture to K. S. Renzaglia.

Villarreal, J.C\*. & K. S. Renzaglia. 2007. Hornwort biology: Phylogeny, character evolution and symbiotic association with cyanobacteria. Department of Biology, University of New Mexico, Albuquerque, USA.

Villarreal, J.C. & K. S. Renzaglia. 2006. Innovaciones anatómicas y ultraestructurales en antocerotes

Neotropicales: los géneros *Leiosporoceros* y *Phaeomegaceros*. IX Congreso Latinoamericano de Botánica-VII Simposio Latinoamericano de Briología: morfología, sistemática y ecología de briofitos. Santo Domingo, República Dominicana.

Renzaglia, K.S.; J.C. Villarreal\*, S. Schuette & R. J. Duff. 2004. Morphological diversity and the evolution of hornworts: a retrospective synopsis. XV World Congress of the International Association of Bryologists, Mérida, Venezuela. Invited lecture to K. S. Renzaglia.

## **OTHER RESEARCH PRESENTATIONS**

Villarreal, J.C. \*, K. McFarland & B. Goffinet. 2010. Thousands of years without sex: The case of the Appalachian *Nothoceros aenigmaticus*. Botanical Society of America, National Congress, Rhode Island.

Sérusiaux, E., J.C. Villarreal A., T. Wheeler & B. Goffinet\*. 2010. Recent origin, active speciation and dispersal for the lichen genus *Nephroma* (Peltigerales) in Macaronesia . Botanical Society of America, National Congress, Rhode Island.

Villarreal, J.C. \*, K. McFarland & B. Goffinet. 2008. Phylogenetic relationships of the *Nothoceros alliance* and the origin of the Appalachian Endemic *Megaceros aenigmaticus*. Botanical

- Society of America, National Congress, Vancouver.
- Villarreal, J.C. \* & K. S. Renzaglia. 2005. Structural innovations in the gametophyte of *Leiosporoceros dussii* (Steph.) Hässel: new insights into hornwort evolution. Botanical Society of America, National Congress, Austin. Honorable Mention in the Symposium.
- Villarreal, J. C.\*; R. J. Duff and K. S. Renzaglia. 2005. Anatomical and ultrastructural innovations in *Leiosporoceros dussii* (Steph.) Hässel. XVII International Botanical Congress, Vienna, Austria, p. 450.
- Villarreal, J.C.\*; S. Schuette, J. Duff, D.C. Cargill & K.S. Renzaglia. 2004. New insights in hornwort character evolution. Botanical Society of America, National Congress, Utah.
- Villarreal, J.C.\*; S. Schuette, J. Witters, K.S. Renzaglia & W. Taylor. 2004. Comparative morphological and ultrastructural survey of hornwort spores. Botanical Society of America, Utah.
- Villarreal Aguilar, J.C.\* & N. Salazar Allen. 2002. Estudio preliminar de la morfología y distribución geográfica del género *Megaceros* en Panamá. In: Rangel, J.O., J. Aguirre C. & M.G. Andrade C. (eds). Libro de Resúmenes 8 vo Congreso Latinoamericano y Segundo Colombiano de Botánica, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá.

#### **MANUSCRIPT REVIEWER**

The Bryologist; Cryptogamie, Bryologie-Lichénologie; Cambridge University Press; Fieldiana; Journal of Experimental Botany; Nova Hedwigia; Phytotaxa; Tropical Bryology.

#### **INTERNATIONAL FIELD EXPERIENCE** (\*organized by JCVA)

Panamá\*, Costa Rica, Venezuela (Mérida), \*Dominican Republic, \*USA (especially Southern Appalachians), \*Mexico, Colombia (Nariño).