

Norman A. Douglas, PhD  
University of Florida  
Department of Biology  
PO Box 118525  
Gainesville, FL 32611  
(352) 294-2842  
[nadouglas@ufl.edu](mailto:nadouglas@ufl.edu)

## Norman A. Douglas

### Education

PhD, Botany, 2007, Duke University. Dissertation Title: "Molecular phylogenetic studies in Nyctaginaceae: patterns of diversification in arid North America".

BSc, Ecology and Evolutionary Biology, 1995, University of Arizona.

### Positions

Lecturer, Dept. of Biology, University of Florida, 2016-present

Adjunct Lecturer & Courtesy Postdoc, Dept. of Biology, University of Florida, 2013-2016

Postdoctoral Research Associate, Dept. of Biology, Oberlin College and Conservatory, 2011-2015.

Postdoctoral Research Associate, Dept. of Plant Biology, North Carolina State University, 2007- 2011.

### Teaching

Lecturer, University of Florida. Courses taught:

BSC1920 *FYI Biology: Biology at UF*

BSC2005 *Biological sciences* (non-majors)

BSC2010 *Integrated Principles of Biology I: Evolution Unit* ( $\frac{1}{3}$  semester)

BSC2011 *Integrated Principles of Biology II: Plant Biology Unit* ( $\frac{1}{3}$  semester)

BSC2011 *Integrated Principles of Biology II: Pre-health Post-baccalaureate section*

BOT2010c *Introductory Botany*

BOT2800c *Plants in Human Affairs*

BOT4935/6935-ZOO4926/6927 *Desert Biodiversity* (Field course taught in AZ & CA)

BOT4935/6935-ZOO4926/6927 *Treetop Biodiversity* (Field course taught in FL)

PCB4674 *Evolution*: Both online and in-person

Additional instructional activities: Contributor to BSC2011 Learning Assistants program. Course developer for online version of PCB4674, BSC2011 and BSC2011L.

### Service

Undergraduate Coordinator, Botany, Zoology, and Marine Sciences, 2020-2023.  
Intro Bio *ad hoc* committee, 2017 onward.

### Publications

da Cunha Neto, I. L., M. R. Pace, N. A. Douglas, M. H. Nee, C. F. C. de Sá, M. J. Moore, and V. Angyalossy. 2020. Diversity, distribution, development, and evolution of medullary bundles in Nyctaginaceae. *American Journal of Botany* 107(5): 707-725.

- da Cunha Neto, I. L., V. Angyalossy, & N.A. Douglas. 2019. What are the "sticky rings" on stems of *Anulocalus* and related taxa (Nyctaginaceae) from arid regions? Journal of the Botanical Research Institute of Texas 13(2):477-485.
- Yao, G., J.-J. Jin, H.-T. Li, J.-B. Yang, V.S. Mandala, M. Croley, R. Mostow, N.A. Douglas, M.W. Chase, M.J.M. Christenhusz, D.E. Soltis, P.S. Soltis, S.A. Smith, S.F. Brockington, M.J. Moore, T.-S. Yi, & D.-Z. Li. 2019. Plastid phylogenomic insights into the evolution of Caryophyllales. Molecular Phylogenetics and Evolution 134: 74–86.
- Rossetto, E.F.S., A.D.D. Faria, P.M. Ruas, C.D.F. Ruas, N.A. Douglas, & J.E.L.D.S. Ribeiro. 2019. Clarifying generic delimitation in Nyctaginaceae tribe Pisonieae after more than a century of taxonomic confusion. Botanical Journal of the Linnean Society 189: 378–396.
- Smith, S.A., J.W. Brown, Y. Yang, R. Bruenn, C.P. Drummond, S.F. Brockington, J.F. Walker, N. Last, N.A. Douglas, & M.J. Moore. 2017. Disparity, diversity, and duplications in the Caryophyllales. New Phytologist.
- Hodel, R.G.J., M.A. Gitzendanner, C.C. Germain-Aubrey, X. Liu, A.A. Crowl, M. Sun, J.B. Landis, M.C. Segovia-Salcedo, N.A. Douglas, S. Chen, D.E. Soltis, & P.S. Soltis. 2016. A New Resource for the Development of SSR Markers: Millions of Loci from a Thousand Plant Transcriptomes. Applications in Plant Sciences 4: 1600024.
- Hodel, R.G.J., M.C. Segovia-Salcedo, J.B. Landis, A.A. Crowl, M. Sun, X. Liu, M.A. Gitzendanner, N.A. Douglas, C.C. Germain-Aubrey, S. Chen, D.E. Soltis, & P.S. Soltis. 2016. The Report of My Death was an Exaggeration: A Review for Researchers Using Microsatellites in the 21st Century. Applications in Plant Sciences 4: 1600025.
- Alexander, P.J., N.A. Douglas, H. Ochoterena, H. Flores-Olvera, & M.J. Moore. 2014. Recent findings on the gypsum flora of the rim of the Guadalupe Mountains, New Mexico, U.S.A.: A new species of *Nerisyrenia* (Brassicaceae), a new state record, and an updated checklist. Journal of the Botanical Research Institute of Texas 8: 383–393.
- Moore, M.J., J.F. Mota, N.A. Douglas, H. Flores-Olvera, & H. Ochoterena. 2014. The ecology, assembly, and evolution of gypsophile floras. Plant Ecology and Evolution in Harsh Environments. Nova Science Publishers: Hauppauge, NY, USA,.
- Stull, G.W., M.J. Moore, V.S. Mandala, N.A. Douglas, H.-R. Kates, X. Qi, S.F. Brockington, P.S. Soltis, D.E. Soltis, & M.A. Gitzendanner. 2013. A Targeted Enrichment Strategy for Massively Parallel Sequencing of Angiosperm Plastid Genomes. Applications in Plant Sciences 1: 1200497.
- Wall, W. A., N.A. Douglas, W.A. Hoffmann, T.R. Wentworth, J.B. Gray, Q.-Y.J. Xiang, B.K. Knaus, & M.G. Hohmann. 2014. Evidence of population bottleneck in *Astragalus michauxii* (Fabaceae), a narrow endemic of the southeastern United States. Conservation Genetics 15: 153–164.
- Douglas, Norman A, W.A. Wall, Q. (Jenny) Xiang, W.A. Hoffmann, T.R. Wentworth, J.B. Gray, & M.G. Hohmann. 2011. Recent vicariance and the origin of the rare, edaphically specialized Sandhills lily, *Lilium pyrophilum* (Liliaceae): evidence from phylogenetic and coalescent analyses. Molecular Ecology 20: 2901–2915.
- Wall, W. A., N.A. Douglas, Q.Y. Xiang, W.A. Hoffmann, T.R. Wentworth, & M.G. Hohmann. 2010. Evidence for range stasis during the latter Pleistocene for the Atlantic Coastal Plain endemic genus, *Pyxidanthera* Michaux. Molecular Ecology 19: 4302–4314.
- Douglas, N. [1], & R. [2] Spellenberg. 2010. A new tribal classification of Nyctaginaceae. Taxon 59: 905–910.
- Douglas, N. A. 2008. *Tripterocalyx carneus* (Nyctaginaceae) Is Self-Compatible. The Southwestern Naturalist 53: 403–406.

Douglas, N. A., & P.S. Manos. 2007. Molecular phylogeny of Nyctaginaceae: taxonomy, biogeography, and characters associated with a radiation of xerophytic genera in North America. *American Journal of Botany* 94: 856–872.

#### Manuscripts in preparation and submitted

Sukhorukov AP, Nilova M, Moore MJ, Bruenn R, Last N, Rossetto EFS, Douglas NA. Anatomical diversity and evolution of the anthocarp in Nyctaginaceae. *In review, Botanical Journal of the Linnean Society*.

Cooper, B.J., Moore, M.J., Douglas, N.A., Wagner, W.L., Johnson, M.G., Overson, R.P., McDonnell, A.J., Fant, J.B., Skogen, K.A., Wickett, N.J.

Reconstructing the recent and rapid radiation of Oenothera sect. Calylophus using target-enrichment and population-level sampling. *In prep for Systematic Biology*.

Douglas, N., Wall, W., Xiang, Q-Y., Hoffmann, W., Wentworth, T., & Hohmann, M. Genetic diversity of the rare Sandhills lily, *Lilium pyrophilum* (Liliaceae) in comparison to its common progenitor, *Lilium superbum*. *Conservation Genetics. Revising for re-submission*.

Douglas, N., Ochoterena, H., Flores-Olvera, H., Hernández-Ledesma, Spellenberg, R., Moore, M. Phylogeny of *Anulocaulis* (Nyctaginaceae) and phylogeography of a gypsum-endemic clade. *In prep*.

#### Funding

UT-Austin Symposium and Workshop on New Methods for Phylogenomics and Metagenomics (travel award), 2013, \$500.

National Geographic Society (co-PI with M. Moore, Oberlin College): Comparative Phylogenetics and Phylogeography of Chihuahuan Desert Gypsum Endemics: Exploring the origins and diversification of an edaphic flora, 2011, \$21,484.

National Science Foundation DDIG: Mating System and Phylogenetics in *Boerhavia* (Nyctaginaceae), 2003, \$10,180 (to P. Manos, Duke University).

Duke University Graduate Conference Travel Awards: Travel to Botanical Society of America annual meetings, 2003, 2005, 2006, \$500 each year.

Research Support Grants from the Mellon Research Training Grant in Plant Systematics, Department of Biology, Duke University, 2000-2003, \$4000 total.

Duke Program in Latin American Studies: Plant Collection in Mexico, 2004, \$1650.

Duke Graduate International Travel Grants: Plant collection in Mexico, 2002, \$3000.

#### Mentorship

*U. Florida*: Kristen Landy (grad student at USF), Christen Cerrito (Environmental consultant, Tampa FL), Ethan Baldwin (beginning graduate school at U. Georgia).

*Oberlin College*: Several undergraduates including Chloe Drummond (Postdoc, Penn State), Anna Brunner, (U. Michigan), Riva Bruenn (PhD candidate, UC-Berkeley) Heather-Rose Kates, (PhD candidate, UF). Senior Honors Thesis Committee, Lila Leatherman.

*North Carolina State*: PhD student Wade Wall (conservation scientist with US Army Corps of Engineers), Zhou Lechang.

*Duke*: REU students John Chau, (Postdoc University of Johannesburg), Gelyn Kline; work-study assistants Krysten Rollins, Bryce Suber, Sara Leonard.

#### Outreach

Chihuahuan gypsum research the subject of ("Plants are Cool, Too! Episode 5: Ay, Chihuahua! New Species in the Desert!")

<http://www.youtube.com/watch?v=a16mBFTkrks>

Instructor, University of North Carolina Botanical Garden, Certificate in Native Plant Studies Program, (2008- 2011).

### Technical reports

- Mehlhop, P., E. Muldavin, T. Bennett, S. Wood, S. Yanoff, N. Douglas, and S. Radjy. (1996) Vegetation of Fort Bliss Texas and New Mexico. Final report volume II: vegetation map. Unpubl. report by NM Natural Heritage Program submitted to Fort Bliss Military Reservation. 32 p. + app.
- Wood, S., S. Yanoff, N. Douglas, S. Radjy, E. Muldavin, and P. Mehlhop. (1997) Vegetation of Fort Bliss, Texas and New Mexico, Vol. 1. Vegetation communities: Unpublished Report, by NM Natural Heritage Program, University of New Mexico, Albuquerque, to the Cultural and Natural Resources Division, Fort Bliss Military Reservation, El Paso, Texas. 50 p.

### Invited seminars

- Oberlin College, Oberlin OH. (2011) "On the origin of Sandhills endemics: a historical study of two rare species."
- US Army Corps of Engineers, ERDC-Environmental Laboratory. (2010) "Genetic perspectives on the conservation of two rare endemics, *Lilium pyrophilum* and *Pyxidanthera barbulata*."
- University of North Carolina, Greensboro (2009) "Rare plants with common Relatives."

### Conference presentations & posters (last 5 years)

(last 10 years, \*talk delivered by mentored undergraduate)

*Botany 2019, Tucson AZ, July 27-31 2019.*

Lopes da Cunha Neto I, Anyalossy V, and Douglas NA. "First report on the structure and histochemistry of the "sticky rings" in stems of *Anulocaulis* (Nyctaginaceae)": Humphreys Emily, Edwards C, Last N, Olivieri J, Brunner A, Mikenas J, Henzler-Lhasawa C, Douglas N, Flores Olvera H, Ochoterena H, Hernandez Ledezma P, Nosratinia S, LoPresti E, Weber M, Thulin M, Perersen G, Friis Ib, Moore M. "Diversification Over Time: Constructing a Molecular Phylogeny of the Four O'Clock Tribe (Nyctaginaceae tribe Nyctagineae)".

McGarvey L, Jiao L, Hutchison V, Joffe J, Douglas N, Ochoterena H, Flores Olvera H, Moore M. "Exploring species boundaries of *Thelesperma* (Asteraceae) on gypsum using molecular phylogenetics".

Moore M, Douglas N, Ochoterena H, Flores Olvera, H. "Patterns of gypsum endemism in Coahuila".

Adler A, Douglas N, Flores Olvera H, Ochoterena H, Moore M. "Unfolding Potential New Taxa of Paperflowers (*Psilostrophe*) on Gypsum."

*Botany 2018, Rochester, MI*

Henzler-Lhasawa, J; Douglas, N; Flores Olvera, H; Ochoterena, H; Moore, M. "Are gypsum plant communities stable during periods of climate change? A phylogeographic case study in *Acleisanthes* (Nyctaginaceae)".

Feng, K; Garnett, S; Douglas, N; Flores Olvera, H; Ochoterena, H; Moore, M. "Disentangling the gypsum endemic *Mentzelia* of the northern Chihuahuan Desert".

\*Edwards, C; LoPresti, E; Douglas, N; Flores Olvera, H; Ochoterena, H; Moore, M. "Niche evolution in *Abronia* and *Tripterocalyx* (Nyctaginaceae)".

Everbach, S; Douglas, N; Flores Olvera, H; Ochoterena, H; Moore, M.

"Phylogeography of *Petalonyx crenatus* (Loasaceae): genetic structure across a gypsum archipelago".

Moore, M.; Last, N; Edwards, C; Douglas, N; Flores Olvera, H; Ochoterena, H; Friis, I; Petersen, G; Thulin, M. "The explosive global diversification of *Commicarpus* (Nyctaginaceae)."

*Botany 2017, Ft. Worth, TX Jun 24-28, 2017:*

Moore, M., Muller, C., Drenovsky, R., Heiden, N., Feder, Z., Tiley, H., Douglas, N., Flores Olvera, H., Ochoterena, H., Montserrat, G., Palacio, S. "Gypsum biomineralization: a key mechanism explaining the historical assembly of gypsum plant communities worldwide?" *Botany 2017, Ft. Worth, TX, Jun 24-28, 2017.*

*Botany 2016, Savannah, GA, Jul 30-Aug 3:*

Moore, MJ; Drake, E; Douglas, NA; Flores Olvera, H; Ochoterena, H. An exception to prove the rule: Do edaphic refugia explain the unusual distribution of *Dermatophyllum* (Fabaceae)?

Loke, E; Douglas, NA; Flores Olvera, H; Ochoterena, H; Moore, MJ. Exploration of gypsum in the heart of the Chihuahuan Desert reveals three new endemic species

\*Edwards, C; Douglas, NA; Ochoterena, H; Flores Olvera, H; Moore, MJ. From coastal strand to gypsum: phylogenetics and niche evolution in *Abronia* and *Tripterocalyx* (Nyctaginaceae)

\*Tiley, H; Wight, S; Charboneau, J; Douglas, NA; Flores Olvera, H; Ochoterena, H; Moore, MJ. Toward a complete species-level phylogeny of the Tribe Helenieae (Asteraceae)

*Caryophyllales 2015, Berlin, Germany, Sept 13-18, 2015:*

Douglas, N., Struwig, M., Hernández-Ledezma, P., Olivieri, J., Last, N., Rossetto, E., Flores Olvera, H., Ochoterena, H, Moore, M. An expanded view of the phylogeny of the Nyctaginaceae based on chloroplast data.

*Botany 2015, Edmonton, AB, Canada Jul 25-29, 2015:*

Moore, M., Douglas, N., Hernández Ledesma, P., Flores Olvera, H., Ochoterena, H., Bruenn, R., Brunner A., Drummond, C., Last, N., Leatherman, L., Mandala, V., Mostow, R. Rare plastome structural changes illuminate demography and dispersal across a gypsum archipelago.

\*Last, N., Thulin, M., Struwig, M., Douglas, N., Moore, M. Global biogeography of *Commicarpus* (Nyctaginaceae) based on nuclear and chloroplast loci.

\*Johnson, E., Ochoterena, H., Flores Olvera, H., Douglas, N., Moore, M.

Exploring the phylogenetic position of a bizarre, poorly known gypsum endemic plant: *Hedyotis teretifolia* (Rubiaceae)

### Reviewer for:

Systematic Biology, Molecular Ecology, Frontiers in Plant Science, Journal of Biogeography, Molecular Phylogenetics and Evolution, Heredity, BMC Evolutionary Biology, Journal of Plant Research, American Journal of Botany, Sexual Plant Reproduction, Journal of Systematics and Evolution, South African Journal of Botany, Journal of Plant Biology, Plant Systematics and Evolution, Systematic Botany, Acta Botánica Mexicana, PLOS One, Applications in Plant Sciences, Southwestern Naturalist.

### Fieldwork & collecting

Eastern US: Coastal Plain & Appalachians, NJ to TX. (continuously 2007-2010).

Western US: AZ, NV, NM, TX: (continuously 1993-2004, 2009, 2013, 2018).

Costa Rica: Organization for Tropical Studies, Tropical Plant Systematics: (2000).

Mexico: Chihuahuan Desert Region (2002, 2011, 2012, 2013), Sonoran Desert & Baja California (2004), Veracruz, Puebla, Michoacan & Jalisco: (2014).