Curriculum vitae
Tatyana Livshultz

Contact information

Academy of Natural Sciences of Drexel University, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103, USA
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Education

1995 Bachelor of Arts (with honors). University of Chicago, Chicago, IL. Biology.

2003 Ph.D. Cornell University, Ithaca, NY. Plant Biology.

Dissertation title: Systematics of *Dischidia* R. Br. (Apocynaceae, Asclepiadoideae)

Dissertation committee: Melissa A. Luckow, Jeff J. Doyle, Dominick J. Paolillo, Terence P. Delaney.

Appointments

2003-2005 Mercer Post-doctoral Fellow, Arnold Arboretum, Harvard University.

2006- 2007 Herbarium associate, Arnold Arboretum and Harvard University Herbaria.

2006-2008 Assistant professor, Department of Biology, University of Nebraska Omaha; curator of vascular plants OMA herbarium.

2008- present Assistant curator of Botany, Academy of Natural Sciences of Drexel University.

2012- present Assistant professor, Department of Biodiversity Earth and Environmental Sciences, Drexel University.

Funding (prior to appointment at Academy)

1998. Livshultz , T (PI**).** Bailey Hortorium Moore/ Mellon Fund Travel Grant. $800.

1999. Livshultz , T (PI**).** Cornell Sigma Xi Grant for Student Research. Systematics and evolution of ant associations in the Southeast Asian epiphyte *Dischidia* (Asclepiadaceae, milkweed family) $500.

1999. Livshultz , T (PI**).** Botanical Society of America Karling Graduate Research Grant. Systematics and evolution of ant associations in the Souteast Asian epiphyte *Dischidia* (Asclepiadaceae, milkweed family) $500.

1999. Livshultz , T (PI**).** Einaudi Foundation International Research Travel Grant. Systematics of the genus *Dischidia* R. Br. $1000.

1999. Livshultz , T (PI**).** Explorer's Club Exploration Fund. Systematics and evolution of ant associations in the Southeast Asian epiphyte *Dischidia* (Asclepiadaceae, milkweed family) $1200.

1999. Livshultz , T (PI**).** American Society for Plant Taxonomy Graduate Research Grant. Systematics and evolution of ant associations in the Southeast Asian epiphyte *Dischidia* (Asclepiadaceae, milkweed family) $1000.

1999. Luckow, M. (PI) and **T. Livshultz (co-PI).** National Science Foundation. DEB- Dissertation Improvement Grant. Systematics of the genus *Dischidia* R. Br. (Marsdenieae, Asclepiadaceae) and the tribe Marsdenieae. (With M. Luckow) $10,000.

2007. Livshultz , T (PI**).** UNO University Committee on Research and Creative Activity. Grant-in-Aid. Evolution of complex floral morphologies in the family Apocynaceae investigated with nuclear genes. $4,500.

2008. Livshultz , T (PI**).** UNO University Committee on Research and Creative Activity. Grant-in-Aid. The Evolution of a Floral Novelty: Developmental Gene Expression in the Milkweed Corona. $4,500.

Extramural Funding (since appointment at Academy)

2009. Livshultz , T (PI**).** Andrew W. Mellon Foundation. Global Plants Initiative. $96,000. 7/1/2009 – 6/31/2010.

2010. Livshultz , T (PI**).** Andrew W. Mellon Foundation. Global Plants Initiative. $93,000. 7/1/2010 – 6/31/2011.

2010. Livshultz , T (PI**).** American Philosophical Society. Franklin Research Grant. Pollination of primitive milkweeds and their relatives: testing the fitness benefit of a remarkable floral adaptation. $2,000.

2011. Livshultz , T. (PI**).** Andrew W. Mellon Foundation. Global Plants Initiative. $94,000. 7/1/2011 – 6/31/2012.

2011. Livshultz , T. (PI**).** National Science Foundation. EF-1115131. Digitization TCN Collaborative Research: North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change. $107,996. 07/01/11 – 6/31/2015.

2011. Livshultz , T (PI**).** Andrew W. Mellon Foundation. Global Plants Initiative. $27,600. 2/1/2012 – 7/31/2012.

2012. Livshultz , T. (PI**).** Andrew W. Mellon Foundation. Global Plants Initiative. $96,000. 7/1/2012 – 6/31/2013.

2013. Karol, K. (PI), R. McCourt (co-PI), **T. Livshultz** (co-PI), and K. Barringer (co-PI). (subaward on collaborative proposal.) EF- 1304933 National Science Foundation. Collaborative Research: Digitization TCN: The Macroalgal Herbarium Consortium: Accessing 150 Years of Specimen Data to Understand Changes in the Marine/Aquatic Environment. $84,745. 8/1/2013-12/31/2017.

2015. Joubert, L. (PI), **T. Livshultz** (co-investigator). South African National Research Foundation: Thuthuka Funding Instrument. Biogeography and evolutionary history of pollen aggregation in African Periplocoideae. R 186,700.

2015. Hodge, K. (PI), R. McCourt (co-PI), **T. Livshultz** (co-PI), M. Vincent (co-PI). (subaward on collaborative proposal.) EF-1502748 National Science Foundation. Digitization TCN: Collaborative: The Microfungi Collections Consortium: A Networked Approach to Digitizing Small Fungi with Large Impacts on the Function and Health of Ecosystems. $ 70,828. 7/1/2015 – 6/31/2018.

2016. Livshultz, T. (PI) and R. McCourt (co-PI). DBI-1601503 National Science Foundation. Collaborative Research: Digitization TCN: The Mid-Atlantic Megalopolis: Achieving a greater scientific understanding of our urban world. $626,928. 9/15/2016 – 8/31/2019.

2017. Livshultz, T. (PI). DEB-1655553 National Science Foundation. Collaborative Research: Macroevolution of a group of plant secondary defense compounds (pyrrolizidine alkaloids) in the dogbane and milkweek flowering plant family (Apocynaceae). $309,342. June 1, 2017-May 31, 2020.

Extramural Funding (to trainees since appointment at Drexel)

2015. McHone, E. (PI). American Society of Plant Taxonomists. Graduate Student Grant. "Co-phylogeny in a host-herbivore system: Dogbanes and their beetles (*Apocynum*, Apocynaceae)–(*Chrysochus*, Eumolpinae, Chrysomelidae)." $800. May 2015-April 2016.

2016. McHone, E. (PI). Society of Systematic Biologists. Graduate Student Research Award. "Co-phylogeny in a host-herbivore system: Dogbanes and their beetles (*Apocynum*, Apocynaceae)–(*Chrysochus*, Eumolpinae, Chrysomelidae)." $1,500. May 2016-April 2017.

2017. McHone, E. (Fellow). NSF East Asia and Pacific Summer Institutes. U.S. Graduate Student Fellowship. "EAPSI: Plant-herbivore interactions and host race formation: Reconstructing the evolution of *Chrysochus*-Apocynaceae associations." $5,400. June 12-August 5, 2017.

Intramural Funding (since appointment at Drexel)

2013. Livshultz, T. (PI) Drexel University Career Development Award. *Pollination Biology in South Africa***.** $7,500.

2014. Livshultz, T. (co-PI) and S. O'Donnell (co-PI). Cottswald Foundation. N*euroecology and pollination biology of SE Asian social wasps.* $ 25,269.

2015. Livshultz, T. (PI). CTRI-GCF, Drexel University Medical School. *Phylogenomics and Evolution of the Indole Alkaloid Biosynthetic Pathway in Apocynaceae (Dogbane and Milkweed Family)*. $10,000. 12/15/2015 – 12/30/2016.

Intramural Funding (to trainees since appointment at Drexel)

2013. McHone, E. (Fellow). "Dean's Fellowship" Doctoral student funding. $10,000. September 2013-August 2015.

2015. McHone, E. (Fellow). "Claudio Elia Memorial Fellowship" "Co-phylogeny in a host-herbivore system: Dogbanes and their beetles (*Apocynum*, Apocynaceae)–(*Chrysochus*, Eumolpinae, Chrysomelidae)." $7,500. September 2015-August 2016.

2016. McHone, E. (Fellow) Lee Smith Traveling Fellowship. Research trip to China. $2,500.July 2016-June 2017.

2017. McHone, E. (Fellow) William L. McLean III Fellowship. Fellowship for graduate student research in Environmental Science and Ornithology. $12,500. February 2016-January 2017.

2017. Smith, C. (Fellow). "Dean's Fellowship" Doctoral student funding. $10,000. September 2016-August 2018.

Awards

2002. Botanical Society of America Maynard Moseley Award for "Comparative morphology and development of staminal coronas in *Dischidia*. (Asclepiadoideae, Apocynaceae)."

Publications

H-index: 9 source: Google Scholar on 08/20/2018

Peer-reviewed papers

Livshultz, T. 2003. Lectotypification of *Dolichostegia* Schlechter (Asclepiadoideae, Apocynaceae) and a new combination, *Dischidia boholensis*. Taxon 52(3): 595-600.

Livshultz, T. 2003. *Dischidia cleistantha* (Apocynaceae, Asclepiadoideae): A new Philippine endemic. Novon 13(1): 89-96.

Livshultz, T., B. T. Tran, S. Somvangsa, and D. H. Schott. 2005 *Dischidia* (Apocynaceae, Asclepiadoideae) in Laos and Vietnam. Blumea 50(1) 113-134.

Luckow, M., R. H. Fortunato, S. Sede, **T. Livshultz.** 2005. The phylogenetic affinities of two mysterious monotypic mimosoids from southern South America. Systematic Botany 30(3): 585-602.

Livshultz, T. 2007. The identity of *Dischidia micholitzii* (Apocynaceae, Asclepiadoideae). Edinburgh Journal of Botany. 64: 311-315.

Livshultz, T., D. J. Middleton, M. E. Endress, and J. K. Williams. 2007. Phylogeny of Apocynoideae (Apocynaceae) and the APSA clade. Annals of the Missouri Botanical Garden. 94: 324-359.

Simões, A. O., **T. Livshultz,** E. Conti, and M. E. Endress. 2007. Phylogeny and systematics of Rauvolfioideae (Apocynaceae) based on molecular and morphological evidence. Annals of the Missouri Botanical Garden. 94: 268-297.

Meve, U., Laurente, O., Alejandro, G.J., & **Livshultz, T.** 2009. Systematics of *Clemensiella* (Apocynaceae-Asclepiadoideae). Edinburgh Journal of Botany 66:447-457.

Livshultz, T. 2010. The phylogenetic position of milkweeds (Apocynaceae subfamilies Secamonoideae and Asclepiadoideae): Evidence from the nucleus and chloroplast. Taxon 59: 1016-1030.

Livshultz, T., J.V. Mead, D. Goyder, and M. Brannin. 2011. Climate niches of milkweeds with plesiomorphic traits (Secamonoideae, Apocynaceae) and the milkweed sister group link ancient African climates and floral evolution. American Journal of Botany 98: 1978-1988.

Straub, S.C.K., Fishbein, M., **Livshultz, T.,** Foster, Z., Parks, M., Weitemier, K., Cronn, R.C., & Liston, A. 2011. Building a model: Developing genomic resources for common milkweed (*Asclepias syriaca*) with low coverage genome sequencing. BMC Genomics. 12(1): 211.

Middleton, D. J. & **T. Livshultz.** 2012. *Streptoechites*, a new genus of Asian Apocynaceae. Adansonia. 34(2): 365-375.

Straub, S.C.K.[*], Moore, M.J., Soltis, P. S., Soltis, D. E., Liston, A., and **T. Livshultz[*].** 2014. Phylogenetic signal detection from an ancient rapid radiation: Effects of noise reduction, long-branch attraction, and model selection in crown clade Apocynaceae. Molecular Phylogenetics and Evolution 80: 169-185. [*] equal contribution.

McHone, E. E.[**], H. Won and **T. Livshultz**. 2015. *Sarcolobus cambogensis* (Marsdenieae, Asclepiadoideae, Apocynaceae): A new rheophytic shrub from Cambodia. Phytotaxa 197 (1):45-53. [**] Drexel student.

Burzynski, E.A., K.P. Minbiole, and **T. Livshultz**. 2015. New sources of lycopsamine-type pyrrolizidine alkaloids and their distribution in Apocynaceae. Biochemical Systematics and Ecology 59: 331-339.

Livshultz, T., Middleton, D.J., van der Ham, R.W.J.M., & Khew, G. 2018. Generic delimitation in Apocyneae (Apocynaceae). Taxon 67:341-358.

Livshultz, T., Kaltenegger, E., Straub, S.C.K., Weitemier, K., Hirsch, E.*, Koval, K.*, Mema, L.**, & Liston, A. 2018. Evolution of pyrrolizidine alkaloid biosynthesis in Apocynaceae: revisiting the defence de-escalation hypothesis. New Phytologist 218:762-773. * Drexel undergraduates. ** Drexel graduate student.

Livshultz, T., Hochleitner, S., & Lakata, E. 2018. Pollen transfer efficiency of *Apocynum cannabinum* (Apocynaceae): a comparative perspective. Journal of Pollination Ecology 22:35-48.

von Konrat, M., Campbell, T., Carter, B., Greif, M., Bryson, M., Larraín, J., Trouille, L., Cohen, S., Gaus, E., Qazi, A., Ribbens, E., **Livshultz, T.,** Walker, T.J., Suwa, T., Peterson, T., Rodriguez, Y., Vaughn, C., Yang, C., Aburahmeh, S., Carstensen, B., de Lange, P., Delavoi, C., Strauss, K., Drag, J., Aguero, B., Snyder, C., Martinec, J., & Smith, A. 2018. Using citizen science to bridge taxonomic discovery with education and outreach. *Applications in Plant Sciences* 6:e1023.

Tasca, J.A., Smith, C.R.**, Burzynski, E.A., Sundberg, B.N., Lagalante, A.F., **Livshultz, T**., & Minbiole, K.P.C. 2018. HPLC- MS detection of pyrrolizidine alkaloids and their N- oxides in herbarium specimens dating back to the 1850s. Applications in Plant Sciences 6:e1143.** Drexel graduate student.

Fishbein, M., **Livshultz, T.**, Straub, S.C.K., Simões, A.O., Boutte, J., McDonnell, A., & Foote, A. 2018. Evolution on the backbone: Apocynaceae phylogenomics and new perspectives on growth forms, flowers, and fruits. American Journal of Botany 105:1-19.

Ollerton, J., Liede-Schumann, S., Endress, M.E., Meve, U., Rech, A.R., Shuttleworth, A., Keller, H.A., Fishbein, M., Alvarado-Cárdenas, L.O., Amorim, F.W., Bernhardt, P., Celep, F., Chirango, Y., Chiriboga-Arroyo, F., Civeyrel, L., Cocucci, A., Cranmer, L., da Silva-Batista, I.C., de Jager, L., Deprá, M.S., Domingos-Melo, A., Dvorsky, C., Agostini, K., Freitas, L., Gaglianone, M.C., Galetto, L., Gilbert, M., González-Ramírez, I., Gorostiague, P., Goyder, D., Hachuy-Filho, L., Heiduk, A., Howard, A., Ionta, G., Islas-Hernández, S.C., Johnson, S.D., Joubert, L., Kaiser-Bunbury, C.N., Kephart, S., Kidyoo, A., Koptur, S., Koschnitzke, C., Lamborn, E., **Livshultz, T.,** Machado, I.C., Marino, S., Mema, L.**, Mochizuki, K., Morellato, L.P.C., Mrisha, C.K., Muiruri, E.W., Nakahama, N., Nascimento, V.T., Nuttman, C., Oliveira, P.E., Peter, C.I., Punekar, S., Rafferty, N., Rapini, A., Ren, Z.-X., Rodríguez-Flores, C.I., Rosero, L., Sakai, S., Sazima, M., Steenhuisen, S.-L., Tan, C.-W., Torres, C., Trøjelsgaard, K., Ushimaru, A., Vieira, M.F., Wiemer, A.P., Yamashiro, T., Nadia, T., Queiroz, J., & Quirino, Z. 2018. The diversity and evolution of pollination systems in large plant clades: Apocynaceae as a case study. Annals of Botany:mcy127-mcy127. ** Drexel graduate student.

Chapters

Luckow, M., J. T. Miller, D. J. Murphy, and **T. Livshultz.** 2003. A phylogenetic analysis of Mimosoideae (Leguminosae) based on chloroplast DNA sequence. *Advances in Legume Systematics (Part 10)*. 197-220 in B. B. Klitgaard and A. Bruneau, eds. The Royal Botanic Garden, Kew.

Non-peer-reviewed articles

Freire-Fierro, A. & **T. Livshultz.** 2009. PH - Academy of Natural Sciences of Philadelphia Herbarium. The Vasculum 4(2): 2-6.

Presentations

Keynote/Invited

2009. Evolution of Pollination Mechanisms in Apocynaceae (the Milkweed family). Rutgers University.

2009. Evolution of Pollination Mechanisms in Apocynaceae (the Milkweed family). University of Pennsylvania.

2009. Phylogeny and Classification of Apocynaceae s.l. in the Flora of Thailand. Kasertsart University, Bangkok.

2009. Evolution of Pollination Mechanisms in the milkweed family (Apocynaceae). Torrey Botanical Club, New York.

2009. Evolution of Pollination Mechanisms in the milkweed family (Apocynaceae). New York Botanical Garden.

2011. Putting milkweeds in context: understanding the origin of floral innovation. Cornell University.

2011. Putting milkweeds in context: understanding the origin of floral innovation. West Virginia University.

2012. On the origin of milkweeds (Apocynaceae). Temple University.

2014. Plant-animal interactions in the milkweed and dogbane family (Apocynaceae)-an evolutionary perspective. National Museum of Natural Sciences, Taichung, Taiwan.

2016. Macroevolution of pyrrolizidine alkaloids in Apocynaceae: a test of defense de-escalation. Biology Department, University of Nebraska Lincoln. March 10.

2016. Putting milkweeds in context: The evolution and function of pollen aggregation in Apocynaceae. Smithsonian Botanical Symposium. May 20.

2017. Macroevolution of homospermidine synthase and pyrrolizidine alkaloids in Apocynaceae: a case of defense de-escalation. Entomology Department, Penn State University. September 15.

Professional meetings (presenter underlined, student *)

1997. Livshultz, T. and M. Luckow. Phylogenetic relationships among the primarily Madagascan genera *Dichrostachys*, *Gagnebina*, and *Alantsilodendron* (Leguminosae: Mimosoideae). Paper presented at Botany 1997. Abstract: American Journal of Botany 84: 213.

2000. Livshultz, T. 2000. Systematics and evolution of ant-leaves in the genus *Dischidia* (Asclepiadaceae). Paper presented at Botany 1997. Abstract: American Journal of Botany 87: 139.

2002. Livshultz, T. Comparative morphology and development of staminal coronas in *Dischidia*. (Asclepiadoideae, Apocynaceae). Paper presented at Botany 2002.

2003. Livshultz, T., B. T. Tran, S. Somvangsa, and D. H. Schott. Systematics and Ecology of *Dischidia* (Apocynaceae, Asclepiadoideae) in Vietnam and Laos. Smithsonian Botanical Symposium. Poster.

2004. Livshultz, T., D. Middleton, M. Endress, and J. K. Williams. Systematics of the subfamily Apocynoideae (Apocynaceae) and the APSA clade. Paper presented at Botany 2004.

2005. Livshultz, T., D. Middleton, M. Endress, and J. K. Williams. Progress in the systematics of the Apocynoideae. Paper presented at International Botanical Congress.

2005. Widhelm, T.*, R. Egan, and T. Livshultz. * student presenter, M.S. candidate at University of Nebraska at Omaha. "Phylogenetic relationships in the *Parmotrema perforatum* group in North America based on the glyceraldehyde-3-phosphate (*GDP*) gene." Poster at American Bryological and Lichenological Society Meeting.

2007. Livshultz, T. Systematics of the Apocynaceae. Paper presented at Fourth Annual Great Plains Plant Systematics Symposium.

2008. Livshultz, T. and D. Middleton. Systematics of Apocynaceae in the flora of Cambodia, Laos, and Vietnam. Oral presentation. Paper presented at First International Conference for the Flora of Cambodia, Laos, and Vietnam.

2009. Livshultz, T. and E.M. Kramer. Expression patterns of A- and C-class MADS-box genes identify the corona of *Asclepias syriaca* (Apocynaceae) as staminal appendages. Paper presented at Botany 2009.

2009. Livshultz, T. Phylogeny of crown clade Apocynaceae: nuclear locus supports surprising milkweed sister-group. Paper presented at Botany 2009.

2010. Livshultz, T. and S. Hochleitner. Pollen transfer efficiency in *Apocynum cannabinum* (Apocynaceae): an evolutionary perspective. Paper presented at Botany 2010.

2010. Livshultz, T., S. Frasier, and L. Struwe.. Phylogeny of the "rest" of Gentianales (Excluding Rubiaceae): What Can We Conclude From Currently Available Data? Paper presented at. Fifth International Rubiaceae and Gentianales Conference.

2011. Livshultz, T. The botanical herbarium of the Academy of Natural Sciences enters its third century: looking forward and back. Paper presented at Consortium of Northeast Herbarium annual meeting, Philadelphia.

2011. Livshultz, T. Putting milkweeds (Apocynaceae subfamilies Asclepiadoideae and Secamonoideae) in context: understanding the origins of extreme pollen transfer efficiency**.** Paper presented at International Botanical Congress, Melbourne, Australia.

2012. Livshultz, T. (presenter), S. Straub, and A. Liston. Extending a model: phylogeny of crown clade Apocynaceae based on the coding portion of the plastome. Paper presented at Botany 2012.

2013. Livshultz, T. (presenter), S. Liede-Schumann, U. Meve, P. Forster, L. Wanntorp. Phylogeny of Marsdenieae (Apocynaceae, Asclepiadoideae) and the circumscription of Marsdenia R.Br. based on chloroplast and nuclear loci. Paper presented at the Botanical Society of America Annual Meeting.

2014. McHone, Elizabeth (presenter)* and T. Livshultz. *Drexel PhD student. *Apocynum* (Apocynaceae) through time and space: dispersal, divergence, and adaptations to temperate habitats. Poster presented at Evolution 2014.

2014. de Jager, J.C. L.*, L. Joubert, and T. Livshultz. * student presenter, M.S. candidate at University of the Free State, South Africa. "Pollen-ovule ratio as a measure of pollen transfer efficiency (PTE) in three species of Periplocoideae (Apocynaceae)." Poster at Association for the Taxonomic Study of the Flora of Tropical Africa (AETFAT) meeting.

2016. Livshultz, T. (presenter), E. Kaltenegger, D. Ober. Macroevolution of pyrrolizidine alkaloids in Apocynaceae: a case of defense de-escalation? Paper presented at Botany 2016. (Savannah, GA, August).

2016. Livshultz, T. (presenter), E. Kaltenegger, D. Ober. Macroevolution of pyrrolizidine alkaloids in Apocynaceae: a case of defense de-escalation? Paper presented at Evolution 2016. (Austin, TX, June 18).

2016. McHone, E. (presenter)* and T. Livshultz. *Drexel PhD student. The proof is in the partially-digested plants: Reconstructing *Chrysochus* (Eumolpinae, Chrysomelidae) phylogeny and host associations through gut DNA extractions. Paper presented at Evolution 2016. (Austin, TX, June 18).

2016. Rodda, M. (presenter), G. Khew, E. Ercole, N. Simonsson Juhonewe, & T. Livshultz. Relationships between *Hoya*, *Dischidia* and *Oreosparte* (Apocynaceae). Paper presented at the10th International Flora Malesiana Symposium (Edinburgh, Scotland, July).

2016. Walter, Lauren (presenter), T. Livshultz, S.C.K. Straub. Comparative genomic analysis of Apocynaceae plastomes: Pseudogenes, repeat content, and molecular evolution. Poster presented at Botany 2016 (Savannah, GA, August).

2017. Foote, Abbey J. (presenter), J. Boutte, M. Fishbein, A. Simoes, T. Livshultz, S.C.K. Straub. Resolving the Phylogenetic Tree of Rauvolfioideae Tribes using the Whole Chloroplast Genome. Poster presented at Botany 2017. (Fort Worth, TX, June).

2017. Straub, Shannon C.K. (presenter), J. Boutte, T. Livshultz, A. Simoes, A. Foote, K. Kostovic, C. Chung, M. Fishbein. Toward a complete subtribal plastome phylogeny of Apocynaceae. Paper presented at Botany 2017. (Fort Worth, TX, June).

2017. Struwe Lena, Tatyana Livshultz, Hannes Hettling, Ruud Scharn, and Alexandre Antonelli. Progress in Gentianales Systematics: Molecular Phylogeny, Morphological Evolution and Divergence times of a Cosmopolitan Asterid Order. Paper presented at XIX International Botanical Congress (Shenzhen, China, July 23-29, 2017).

2017. Straub, Shannon C.K., Tatyana Livshultz, Julien Boutte, Kevin Weitemier, Aaron Liston, Andre Simoes, and Mark Fishbein. Phylogenomics of Apocynaceae: From tools to trees. Paper presented at XIX International Botanical Congress (Shenzhen, China, July 23-29, 2017).

2018. Livshultz, Tatyana, Tasca, Julia*, Minbiole, Kevin, Smith, Chelsea*, Teisher, Jordan, Straub, Shannon. Using herbarium specimens to study plant metabolism: the state of the science and an example from pyrrolizidine alkaloids in Apocynaceae. Paper presented at Botany 2018. (Rochester, MN, July).

2018. Smith, Chelsea R. *, Teisher, Jordan, Straub, Shannon, Livshultz, Tatyana. Does herbivore co-option of a plant defense drive its loss?: Testing the defense de-escalation of pyrrolizidine alkaloid evolution in Apocynaceae (the dogbane and milkweed family). Poster presented at Botany 2018. (Rochester, MN, July).

2018. Fennell, Meredith*, Boutte, Julien, Livshultz, Tatyana, Straub, Shannon. Assessing the phylogeny of Apocyneae (Apocynaceae) using whole chloroplast genomes. Poster presented at Botany 2018. (Rochester, MN, July).

2018. Cullinan, Madison*, Boutte, Julien, Livshultz, Tatyana, Straub, Shannon. Evaluating the phylogenetic relationships of Echiteae, Mesechiteae, and Odontadenieae (Apocynoideae; Apocynaceae) using plastomes and nrDNA. Poster presented at Botany 2018. (Rochester, MN, July).

2018. Straub, Shannon, Boutte, Julien, Fishbein, Mark, Livshultz, Tatyana. A New Probe Set for Targeted Enrichment of Nuclear Genes Across Apocynaceae. Poster presented at Botany 2018. (Rochester, MN, July).

Public

2009. Evolution of Pollination Mechanisms in the milkweed family (Apocynaceae). Symposium: "Darwin and Botany in a Changing World". Philadelphia Botanical Club and ANSP.

2009. Plants and Ecosystems of Cambodia and Thailand. Philadelphia Botanical Club.

2010. Putting milkweeds in context: understanding the origin of floral innovation**.** Philadelphia Botanical Club.

2011. Putting milkweeds in context: understanding the origin of floral innovation. Muhlenberg Botanical Club, Lancaster, PA.

2013. Pollination of *Parsonsia alboflavescens* (Apocynaceae, milkweed family) and comments on the evolution of pharmacophagy in the Danainae (Milkweed butterflies). American Entomological Society.

2013. Aggregated Pollen: Why and Why not? Southeast Pennsylvania Orchid Society.

2013. Close encounters of the floral kind. Academy of Natural Sciences of Drexel University. Botany Month Bicentennial special lecture

2014. Plant-animal interactions in the milkweed and dogbane family (Apocynaceae)-an evolutionary perspective. Singapore Botanical Garden.

2016. Milkweeds and Orchids: Survival of the Most Efficient. United States Botanical Garden. June 10.

Teaching

At Drexel University, Undergraduate

2017. UNIVS S201, Academics and Careers, Drexel University.

2014, 2015, 2016. ENVS 315, Plant-Animal Interactions, Drexel University.

2015, 2016, 2017, 2018. ENVS 102, Natural History, Research and Collections, Drexel University.

2014, 2015, 2017, 2018. ENVS 382 Field Botany of the New Jersey Pine Barrens, Drexel University.

2014. ENVS 280, Natural History, Research and Collections, Drexel University.

At Drexel University, Graduate

2014, 2015, 2016. ENVS 865, Plant-Animal Interactions, Drexel University.

2014, 2015, 2017. ENVS 582, Field Botany of the New Jersey Pine Barrens, Drexel University.

Outside Drexel University

2007. Phylogenetic Systematics, University of Nebraska at Omaha.

2007, 2008. Introductory Biology, University of Nebraska at Omaha.
2007, 2008. Flora of the Great Plains, University of Nebraska at Omaha.

2010, 2012, 2014. Introduction to Pollination Biology, Wagner Free Institute of Science and Pennsylvania Horticultural Society.

Undergraduate Research Trainees in Officially Recognized Research Programs at Drexel University

2013-2014. Rumaan Malhotra, Drexel senior. Supervised research. Project: "Identifying the pollinators of *Parsonsia alboflavescens*."

2014. Adrienne Remo**,** Drexel sophomore. STAR Scholar. Project: "Pollination of plesiomorphic milkweeds in South Africa."

Graduate Research Trainees as Primary Advisor

2013-present. Elizabeth McHone. Ph.D. "Co-phylogeny in a host-herbivore system: dogbanes and their beetles (*Apocynum,* Apocynaceae)–(*Chrysochus*, Eumolpinae, Chrysomelidae)". Expected graduation 2018.

2016-present. Chelsea Smith. Ph.D. "Evolution of pyrrolizidine alkaloid biosynthesis in Apocynaceae". Drexel University. Expected graduation 2021.

Service

Professional Affiliations

American Society of Plant Taxonomists (1997-present)

Botanical Society of America- (1997-present)

International Association for Plant Taxonomy (1998-present)

Philadelphia Botanical Club (2008-present)

Society for Systematic Biology (2014- present)

Appointments at Academy of Natural Sciences of Drexel University

Assistant Curator and Chair of the Botany Department (2008-present).

Director of the Laboratory for Molecular Systematics and Evolution (2010-present)

Committees

Department. Undergraduate Committee (2012-present); pre-term field immersion for incoming BEES freshmen (2013-2016); DESLA camp for high school students (2015)

Professional. American Society of Plant Taxonomists- Collections Committee member (2011-13), chair (2012-2013), NSCA alliance representative (2012-2014).

Botanical Society of America- Moseley Award Committee member (2011-12) & chair (2013).

Philadelphia Botanical Club- Vice President (2010-present).

Review Activities

Grant Review Panels

2011. National Science Foundation. Division of Environmental Biology. Phylogenetic Systematics Program.

2017. National Science Foundation. Division of Environmental Biology. Phylogenetic Systematics Program.

Ad Hoc Reviewer

Journals. *American Journal of Botany, Edinburgh Journal of Botany, International Journal of Plant Science, Madrono, Systematic Botany, Plant Systematics and Evolution, Taxon, Journal of Systematics and Evolution, Proceedings of ANS, Natuurwissenschaft, Turkish Journal of Botany, Phytotaxa, Botanical Journal of the Linnaean Society, PlosOne, Bulletin of the Singapore Botanical Garden, Molecular Phylogenetics and Evolution.*

Grants and Tenure and Reappointment National Science Foundation; International Foundation for Science; National Research Foundation of South Africa; American Society of Plant Taxonomists Graduate Research Grant