Joel H. Nitta

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Studying biology at the intersection of ecology and evolution from species to the globe

Employment

Graduate School of Global and Transdisciplinary Studies, Chiba University — Chiba, Japan
Associate Professor — Apr. 2023 – present

Department of Integrated Biosciences, The University of Tokyo — Tokyo, Japan
Project Research Associate — Apr. 2020 – Mar. 2023

Department of Botany, National Museum of Natural History, Smithsonian Institution — Washington, DC
Peter Buck Postdoctoral Research Fellow — Jan. 2019 – Mar. 2020

Department of Botany, National Museum of Nature and Science — Tsukuba, Japan
Japan Society for the Promotion of Science Postdoctoral Research Fellow — Nov. 2016 - Dec. 2018

Education

Harvard University — Cambridge, MA
PhD, Organismic and Evolutionary Biology — Nov. 2016

University of Tokyo — Tokyo, Japan
MS, Biological Sciences — Mar. 2010

University of California, Berkeley — Berkeley, CA
BA, Integrative Biology and Japanese Language — May 2007

- Highest Honors in Integrative Biology
- Highest Distinction in General Scholarship

Grants

Evolutionary origins of endemic ferns on an island biodiversity hotspot — Tokyo, Japan
Japan Society for the Promotion of Science (Grant-in-Aid for Early-Career Scientists) — 2022 – 2026
$31,000 (PI)

Biogeography of Polynesian Pteridophytes: Insights from DNA barcoding — Washington, DC
Smithsonian Institution Barcode Initiative — 2019
$8,000 (Internal grant)

Elucidating the evolutionary history of a polyploid fern species complex using next-generation sequencing
Japan Society for the Promotion of Science (Grant-in-Aid for JSPS Fellows) — Tsukuba, Japan
$21,000 (Co-PI) — 2016 – 2019

Investigating the role of a cryptic life stage in fern evolution and community assembly — Cambridge, MA
National Science Foundation Doctoral Dissertation Improvement Grant — 2013 – 2015
$21,970 (Co-PI)

Honors

Best Talk — Madison, WI (online)
Intelligent Systems for Molecular Biology EvolCompGen COSI — 2022

The Young Scientist Award — Tokyo, Japan
Japanese Society for Plant Systematics — 2022

Best Oral Presentation — Tokyo, Japan
Japanese Society for Plant Systematics — 2021

Japanese Government (Monbukagakusho: MEXT) Scholarship — Tokyo, Japan
University of Tokyo — 2008

Departmental Citation — Berkeley, CA
Department of Integrative Biology, University of California, Berkeley — 2007

Regents and Chancellor's Scholar — Berkeley, CA
University of California, Berkeley — 2002

Teaching

Undergraduate

Biodiversity and Japan — Chiba, Japan
College of Liberal Arts and Sciences, Chiba University — 2023 Spring

Reproducible Data Analysis — Chiba, Japan
College of Liberal Arts and Sciences, Chiba University — 2023 Summer

Workshops

Spatial Phylogenetics Workshop — Oslo, Norway
ForBio, Natural History Museum, University of Oslo — June 2023

How to Use `targets` for Effective Workflows in R — Oslo, Norway
Univeristy of Oslo Library and Carpentry@UiO — June 2023

ASCS2022 Workshop on Reproducible Scientific Analysis — Online
ISCB 1st Asian Student Council Symposium — Dec. 2022

Modular, Reproducible Bioinformatics Workflows with the `targets` R package — Online
International Society for Computationay Biology — June 2022

Software

For complete summary of projects on github, please see https://github.com/joelnitta

Developer and maintainer

`canaper`
Categorial analysis of neo-and paleo-endemism in R

`dwctaxon`
Tools for working with Darwin Core Taxon data

`taxastand`
Standardize species names across data sources

Maintainer

`restez`
Access GenBank data locally

`rgnparser`
Interface to gnparser in R

Invited Talks

FTOL and PPG2: The Cutting Edge of Pteridophyte Evolution and Systematics* Tsukuba, Japan
Tsukuba Botanical Garden Special Fern Exhibit 2023

DNA Barcoding of Fern Gametophytes: Past, Present, and Future Calicut, India (online)
XVI Conference of the Indian Fern Society and International Symposium 2022

Phylogenetic systematics and community assembly processes in ferns* Online
21st Annual Meeting of the Japanese Society for Plant Systematics 2022
Young Scientist Award Lecture

Fern flora of Moorea and Tahiti, French Polynesia: Community analysis using DNA barcodes* Noda, Japan 2017
Japan Pteridological Society Meeting at the 81st Annual Meeting of the Botanical Society of Japan

**in Japanese*

Publications

Nitta, J. H. (2023). Ferns as a model system for evolutionary biology. *The Journal of Phytogeography and Taxonomy*, *71*(2), 115–126. https://doi.org/10.18942/chiribunrui.0712-03

Song, M. J., Rothfels, C. J., Schuettpelz, E., **Nitta, J. H.** Huiet, L., Li, F.-W., & Wefferling, K. M. (2023). Resolving deep relationships and revealing ancient whole-genome duplications in Pteridaceae using transcriptomic data. *American Fern Journal*, *113*(3). https://doi.org/10.1640/0002-8444-113.3.191

Nitta, J. H. Laffan, S. W., Mishler, B. D., & Iwasaki, W. (2023). canaper: Categorical analysis of neo- and paleo-endemism in R. *Ecography*, e06638. https://doi.org/10.1111/ecog.06638

Nitta, J. H. (2023). Machine learning methods reveal processes affecting abundance at multiple scales. A commentary on "Global and regional drivers of abundance patterns in the hart's tongue fern complex (Aspleniaceae)". *Annals of Botany*, *131*(5), i–ii. https://doi.org/10.1093/aob/mcad024

Chen, C., Lindsay, S., **Nitta, J. H.** Rouhan, G., Sundue, M., Perrie, L. R., Huang, Y., Chiou, W., & Chung, K. (2023). Systematics and biogeography of the Old World fern genus *Antrophyum*. *Cladistics*, cla.12538. https://doi.org/10.1111/cla.12538

Nitta, J. H. Schuettpelz, E., Ramírez-Barahona, S., & Iwasaki, W. (2022). An open and continuously updated fern tree of life. *Frontiers in Plant Science*, *13*, 909768. https://doi.org/10.3389/fpls.2022.909768

Nitta, J. H. Mishler, B. D., Iwasaki, W., & Ebihara, A. (2022). Spatial phylogenetics of Japanese ferns: Patterns, processes, and implications for conservation. *American Journal of Botany*, *109*(5), 727–745. https://doi.org/10.1002/ajb2.1848

Nitta, J. H. & Chambers, S. M. (2022). Identifying cryptic fern gametophytes using DNA barcoding: A review. *Applications in Plant Sciences*, *10*, e11465. https://doi.org/10.1002/aps3.11465

Nitta, J. H. Watkins Jr., J. E., Holbrook, N. M., Wang, T. W., & Davis, C. C. (2021). Ecophysiological differentiation between life stages in filmy ferns (Hymenophyllaceae). *Journal of Plant Research*, *134*(5), 971–988. https://doi.org/10.1007/s10265-021-01318-z

Nitta, J. H. Ebihara, A., & Smith, A. R. (2020). A taxonomic and molecular survey of the pteridophytes of the Nectandra Cloud Forest Reserve, Costa Rica. *PLoS ONE*, *15*(11), e0241231. https://doi.org/10.1371/journal.pone.0241231

Nitta, J. H. Watkins Jr., J. E., & Davis, C. C. (2020). Life in the canopy: Community trait assessments reveal substantial functional diversity among fern epiphytes. *New Phytologist*, *227*(6), 1885–1899. https://doi.org/10.1111/nph.16607

Nitta, J. H. & Ebihara, A. (2019). Virtual issue: Ecology and evolution of pteridophytes in the era of molecular genetics. *Journal of Plant Research*, *132*(6), 719–721. https://doi.org/10.1007/s10265-019-01139-1

Ebihara, A., & **Nitta, J. H.** (2019). An update and reassessment of fern and lycophyte diversity data in the Japanese Archipelago. *Journal of Plant Research*, *132*(6), 723–738. https://doi.org/10.1007/s10265-019-01137-3

Ebihara, A., **Nitta, J. H.** Matsumoto, Y., Fukazawa, Y., Kurihara, M., Yokote, H., Sakuma, K., Azakami, O., Hirayama, Y., & Imaichi, R. (2019). Growth dynamics of independent gametophytes of *Pleurosoriopsis makinoi* (Polypodiaceae). *Bulletin of the National Museum of Nature and Science, Series B (Botany)*, *45*(2), 77–86.

Nitta, J. H. Amer, S., & Davis, C. C. (2018). *Microsorum* × *tohieaense* (Polypodiaceae), a new hybrid fern from French Polynesia, with implications for the taxonomy of *Microsorum*. *Systematic Botany*, *43*(2), 397–413. https://doi.org/10.1600/036364418X697166

Gilbert, K. J., **Nitta, J. H.** Talavera, G., & Pierce, N. E. (2018). Keeping an eye on coloration: Ecological correlates of the evolution of pitcher traits in the genus *Nepenthes* (Caryophyllales). *Biological Journal of the Linnean Society*, *123*(2), 321–337. https://doi.org/10.1093/biolinnean/blx142

Zhou, X.-M., Zhang, L., Chen, C.-W., Li, C.-X., Huang, Y.-M., Chen, D.-K., Thi, N. T., Cicuzza, D., Knapp, R., Tam, T. T., **Nitta, J. H.** Gao, X.-F., & Zhang, L.-B. (2017). A plastid phylogeny and character evolution of the Old World fern genus *Pyrrosia* (Polypodiaceae) with the description of a new genus: *Hovenkampia* (Polypodiaceae). *Molecular Phylogenetics and Evolution*, *114*, 271–294. https://doi.org/10.1016/j.ympev.2017.06.020

Nitta, J. H. Meyer, J.-Y., Taputuarai, R., & Davis, C. C. (2017). Life cycle matters: DNA barcoding reveals contrasting community structure between fern sporophytes and gametophytes. *Ecological Monographs*, *87*(2), 278–296. https://doi.org/10.1002/ecm.1246

Pinson, J. B., Chambers, S. M., **Nitta, J. H.** Kuo, L.-Y., & Sessa, E. B. (2017). The separation of generations: Biology and biogeography of long-lived sporophyteless fern gametophytes. *International Journal of Plant Sciences*, *178*(1), 1–18. https://doi.org/10.1086/688773

Pouteau, R., Meyer, J.-Y., Blanchard, P., **Nitta, J. H.** Terorotua, M., & Taputuarai, R. (2016). Fern species richness and abundance are indicators of climate change on high-elevation islands: evidence from an elevational gradient on Tahiti (French Polynesia). *Climatic Change*, *138*, 143–156. https://doi.org/10.1007/s10584-016-1734-x

Chen, C.-W., **Nitta, J. H.** Fanerii, M., Yang, T. Y. A., Pitisopa, F., Li, C. W., & Chiou, W.-L. (2015). *Antrophyum solomonense* (Pteridaceae), a new species from the Solomon Islands, and its systematic position based on phylogenetic analysis. *Systematic Botany*, *40*(3), 645–651. https://doi.org/10.1600/036364415X689357

Ebihara, A., Yamaoka, A., Mizukami, N., Sakoda, A., **Nitta, J. H.** & Imaichi, R. (2013). A survey of the fern gametophyte flora of Japan: Frequent independent occurrences of noncordiform gametophytes. *American Journal of Botany*, *100*(4), 735–743. https://doi.org/10.3732/ajb.1200555

Nitta, J. H. Ebihara, A., & Ito, M. (2011). Reticulate evolution in the *Crepidomanes minutum* species complex (Hymenophyllaceae). *American Journal of Botany*, *98*(11), 1782–1800. https://doi.org/10.3732/ajb.1000484

Nitta, J. H. Meyer, J.-Y., & Smith, A. R. (2011). Pteridophytes of Mo'orea, French Polynesia: Additional new records. *American Fern Journal*, *101*(1), 36–49. https://doi.org/10.1640/0002-8444-101.1.36

Ebihara, A., **Nitta, J. H.** & Ito, M. (2010). Molecular species identification with rich floristic sampling: DNA

barcoding the pteridophyte flora of Japan. *PLoS ONE*, *5*(12), e15136. https://doi.org/10.1371/journal.pone.0015136

Ebihara, A., **Nitta, J. H.** & Iwatsuki, K. (2010). The Hymenophyllaceae of the Pacific area. 2. *Hymenophyllum* (excluding subgen. *Hymenophyllum*). *Bulletin of the National Museum of Nature and Science, Series B (Botany)*, *36*(2), 43–59. https://www.kahaku.go.jp/research/publication/botany/download/36_2/BNMNS_B360203.pdf

Nitta, J. H. & Epps, M. J. (2009). Hemi-epiphytism in *Vandenboschia collariata* (Hymenophyllaceae). *Brittonia*, *61*(4), 392–397. https://doi.org/10.1007/s12228-009-9097-5

Ebihara, A., **Nitta, J. H.** Lorence, D., & Dubuisson, J.-Y. (2009). New records of *Polyphlebium borbonicum*, an African filmy fern, in the New World and Polynesia. *American Fern Journal*, *99*(3), 200–206. https://doi.org/10.1640/0002-8444-99.3.200

Nitta, J. H. (2008). Exploring the utility of three plastid loci for biocoding the filmy ferns (Hymenophyllaceae) of Moorea. *Taxon*, *57*(3), 725–736. https://doi.org/10.1002/tax.573006

Nitta, J. H. & O'grady, P. (2008). Mitochondrial phylogeny of the endemic Hawaiian craneflies (Diptera, Limoniidae, *Dicranomyia*): Implications for biogeography and species formation. *Molecular Phylogenetics and Evolution*, *46*(3), 1182–1190. https://doi.org/10.1016/j.ympev.2007.12.021

Community Activity

Volunteer Roles

Editorial Board Member 2020 – present
Journal of Plant Research

Subject Editor 2022 – present
Phytokeys

Subject Editor 2017 – 2023
Phytotaxa

Team Member 2018 – present
Software Carpentry Japanese translation team

Societies

American Fern Society, *Botanical Society of Japan*, *Japanese Society for Plant Systematics*

Journals Reviewed

Acta Botanica Gallica, *American Fern Journal*, *American Journal of Botany*, *Annals of Botany*, *AoB PLANTS*, *Australian Systematic Botany*, *Biology Letters*, *Botanical Journal of the Linnean Society*, *Botany Letters*, *Brittonia*, *Ecology and Evolution*, *Journal of Ecology*, *Journal of Plant Research*, *Molecular Phylogenetics and Phylogeny*, *New Phytologist*, *Plant Species Biology*, *Phytotaxa*, *PLoS ONE*, *Taxon*