

Joel H. Nitta

PROJECT RESEARCH ASSOCIATE

Department of Integrated Biosciences, The University of Tokyo

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

Education

Harvard University

PHD IN ORGANISMIC AND EVOLUTIONARY BIOLOGY

- Advisor: Prof. Charles C. Davis
- Dissertation: Ecology and Evolution of the Ferns of Moorea and Tahiti, French Polynesia

Cambridge, MA

Nov. 2016

University of Tokyo

MS IN BIOLOGICAL SCIENCES

- Advisor: Prof. Motomi Ito
- Thesis: Reticulate Evolution in the *Crepidomanes minutum* Species Complex (Hymenophyllaceae)

Tokyo, Japan

Mar. 2010

University of California, Berkeley

BA IN INTEGRATIVE BIOLOGY AND JAPANESE LANGUAGE

- Advisor: Prof. Brent D. Mishler
- Honor's Thesis: The Filmy Ferns of Moorea, French Polynesia: A Case Study in Integrative Taxonomy
- Highest Honors in Integrative Biology
- Highest Distinction in General Scholarship

Berkeley, CA

May 2007

Skills

Field Pteridophyte species identification, botanical specimen collection, field survey design

Lab DNA extraction, PCR, Sanger DNA sequencing, next-gen DNA sequencing (sequence capture), gel electrophoresis, cloning

Programming R, Docker, Git, bash

Languages English (native), Japanese (fluent), Spanish (beginner)

Teaching Certified Software Carpentry Instructor

Experience

Department of Integrated Biosciences, The University of Tokyo

PROJECT RESEARCH ASSOCIATE

- Providing analytical support for various -omics projects.

Tokyo, Japan

Apr. 2020 -

Department of Botany, National Museum of Natural History, Smithsonian Institution

PETER BUCK POSTDOCTORAL RESEARCH FELLOW

- Assembled a global dataset to analyze the biogeographical history of ferns and lycophytes in the tropical Pacific.

Washington, DC, USA

Jan. 2019 - Mar. 2020

Department of Botany, National Museum of Nature and Science

JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE POSTDOCTORAL RESEARCH FELLOW

- Applied next-generation DNA sequencing to reconstruct the evolutionary history of the *Thelypteris angustifrons* fern species complex.

Tsukuba, Japan

Nov. 2016 - Dec. 2018

Harvard University Herbaria

CURATORIAL FELLOW

- Updated organization of pteridophytes to reflect current understanding of phylogeny.

Cambridge, MA

Jan. 2016 - Jun. 2016

Harvard University

GRADUATE STUDENT INSTRUCTOR

- Taught lab section of OEB 52, Biology of Plants.

Cambridge, MA

Jan. 2014 - May 2014

Harvard University

GRADUATE STUDENT INSTRUCTOR

- Taught lab section of OEB 52, Biology of Plants.

Cambridge, MA

Jan. 2013 - May 2013

Moorea Biocode Project

RESEARCH STAFF

- Oversaw collection of all fern species on island of Moorea, French Polynesia.
- Developed guide and key to Moorean ferns (<http://ucjeps.berkeley.edu/moorea/>).

Moorea, French Polynesia

Apr. 2010 - Aug. 2011

O'Grady Lab, Environmental Science, Policy, and Management, UC Berkeley

UNDERGRADUATE RESEARCH APPRENTICE

- Conducted phylogenetic analysis of evolutionary history and biogeography of endemic Hawaiian *Dicranomyia* (craneflies).

Berkeley, CA

Jan. 2006 - Aug. 2006

Student Learning Center, UC Berkeley

BIOLOGY TUTOR

- Tutored students in general biology and received training to lead study groups.

Berkeley, CA

Jan. 2006 - May 2006

Software

Software that I developed and maintain:

canaper

CATEGORIAL ANALYSIS OF NEO-AND PALEO-ENDEMISM

- Analyzes metrics of phylogenetic biodiversity
- Increased speed via parallelization
- Currently in review at [ROpenSci](#)

<https://github.com/joelnitta/canaper>

R package

taxastand

STANDARDIZE SPECIES NAMES ACROSS DATA SOURCES

- Resolves synonyms in species names
- Implements fuzzy matching
- Accounts for the rules of biological nomenclature

<https://github.com/joelnitta/taxastand>

R package

dwctaxon

TOOLS FOR WORKING WITH DARWIN CORE TAXON DATA

- Create/edit data conforming to Darwin Core Taxon format
- Validate datasets
- Automatically map synonyms

<https://github.com/joelnitta/dwctaxon>

R package

gbfetch

FETCH GENBANK SEQUENCES

- Download GenBank sequences and metadata directly into R
- Accepts search string in same format as GenBank

<https://github.com/joelnitta/gbfetch>

R package

readmedown

GENERATE DATA README FILES

- Makes generating README files for data repositories easy
- Verifies that data content match description

<https://github.com/joelnitta/readmedown>

R package

Software that I maintain:

restez

ACCESS GENBANK DATA LOCALLY

- Download GenBank data to a local database
- Query and extract GenBank data locally

<https://github.com/ropensci/restez>

R package

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

Grants & Awards

2022	Japan Society for the Promotion of Science Kakenhi (Grant-in-Aid for Early-Career Scientists), \$31,000	Tokyo, Japan
2019	Smithsonian Institution Barcode Initiative, \$8,000	Washington, DC
2016	Japan Society for the Promotion of Science Kakenhi (Grant-in-Aid for JSPS Fellows), \$21,000	Tsukuba, Japan
2015	Pteridological Section of the Botanical Society of America Warren H. Wagner, Jr. Student Travel Award, \$500	Edmonton, Canada
2015	National Science Foundation Doctoral Dissertation Improvement Grant, \$13,000	Cambridge, MA
2013	Garden Club of America Award in Tropical Botany, \$5,500	Cambridge, MA
2012	American Society of Plant Taxonomists Research Grant for Graduate Students, \$850	Cambridge, MA
2012	Systematics Association Systematics Research Fund, \$2,350	Cambridge, MA
2012	Society of Systematic Biologists Graduate Student Research Award, \$1,900	Cambridge, MA
2008	University of Tokyo Academic Research Grant, International, \$1,500	Tokyo, Japan

Honors

2022	Best Talk, Intelligent Systems for Molecular Biology EvolCompGen COSI	Madison, WI (online)
2022	The Young Scientist Award, Japanese Society for Plant Systematics	Tokyo, Japan
2021	Best Oral Presentation, Japanese Society for Plant Systematics	Tokyo, Japan
2008	Japanese Government (Monbukagakusho: MEXT) Scholarship, University of Tokyo	Tokyo, Japan
2007	Phi Beta Kappa Society, University of California, Berkeley	Berkeley, CA
2007	Departmental Citation, Department of Integrative Biology, University of California, Berkeley	Berkeley, CA
2002	Regents and Chancellor's Scholar, University of California, Berkeley	Berkeley, CA

Publications

JOURNAL ARTICLES

Identifying cryptic fern gametophytes using DNA barcoding: A review

J. H. NITTA, S. M. CHAMBERS

Applications in Plant Sciences 10 (2022) e11465. DOI: [10.1002/aps3.11465](https://doi.org/10.1002/aps3.11465)

Spatial Phylogenetics of Japanese Ferns: Patterns, Processes, and Implications for Conservation

J. H. NITTA, B. D. MISHLER, W. IWASAKI, A. EBIHARA

American Journal of Botany 109.5 (2022) pp. 727–745. DOI: [10.1002/ajb2.1848](https://doi.org/10.1002/ajb2.1848)

An Open and Continuously Updated Fern Tree of Life (FTOL)

J. H. NITTA, E. SCHUETTPELZ, S. RAMÍREZ-BARAHONA, W. IWASAKI

Frontiers in Plant Sciences (2022) In Press. DOI: [10.1101/2022.03.31.486640](https://doi.org/10.1101/2022.03.31.486640)

Ecophysiological differentiation between life stages in filmy ferns (Hymenophyllaceae)

J. H. NITTA, J. E. WATKINS JR. N. M. HOLBROOK, T. W. WANG, C. C. DAVIS

Journal of Plant Research 134.5 (2021) pp. 971–988. DOI: [10.1007/s10265-021-01318-z](https://doi.org/10.1007/s10265-021-01318-z)

A taxonomic and molecular survey of the pteridophytes of the Nectandra Cloud Forest Reserve, Costa Rica

J. H. NITTA, A. EBIHARA, A. R. SMITH

PLoS ONE 15.11 (2020) e0241231. DOI: [10.1371/journal.pone.0241231](https://doi.org/10.1371/journal.pone.0241231)

Life in the canopy: Community trait assessments reveal substantial functional diversity among fern epiphytes

J. H. NITTA, J. E. WATKINS JR. C. C. DAVIS

New Phytologist 227.6 (2020) pp. 1885–1899. DOI: [10.1111/nph.16607](https://doi.org/10.1111/nph.16607)

An update and reassessment of fern and lycophyte diversity data in the Japanese Archipelago

A. EBIHARA, J. H. NITTA

Journal of Plant Research 132.6 (2019) pp. 723–738. DOI: [10.1007/s10265-019-01137-3](https://doi.org/10.1007/s10265-019-01137-3)

Growth dynamics of independent gametophytes of *Pleurosoriopsis makinoi* (Polypodiaceae)

A. EBIHARA, J. H. NITTA, Y. MATSUMOTO, Y. FUKAZAWA, M. KURIHARA, H. YOKOTE, K. SAKUMA, O. AZAKAMI, Y. HIRAYAMA, R. IMAICHI
Bulletin of the National Museum of Nature and Science, Series B (Botany) 45.2 (2019) pp. 77–86

Virtual issue: Ecology and evolution of pteridophytes in the era of molecular genetics

J. H. NITTA, A. EBIHARA

Journal of Plant Research 132.6 (2019) pp. 719–721. doi: [10.1007/s10265-019-01139-1](https://doi.org/10.1007/s10265-019-01139-1)

Keeping an eye on coloration: Ecological correlates of the evolution of pitcher traits in the genus *Nepenthes* (Caryophyllales)

K. J. GILBERT, J. H. NITTA, G. TALAVERA, N. E. PIERCE

Biological Journal of the Linnean Society 123.2 (2018) pp. 321–337. doi: [10.1093/biolinnean/blx142](https://doi.org/10.1093/biolinnean/blx142)

Microsorium* × *tohieaense* (Polypodiaceae), a new hybrid fern from French Polynesia, with implications for the taxonomy of *Microsorium

J. H. NITTA, S. AMER, C. C. DAVIS

Systematic Botany 43.2 (2018) pp. 397–413. doi: [10.1600/036364418X697166](https://doi.org/10.1600/036364418X697166)

Life cycle matters: DNA barcoding reveals contrasting community structure between fern sporophytes and gametophytes

J. H. NITTA, J.-Y. MEYER, R. TAPUTUARAI, C. C. DAVIS

Ecological Monographs 87.2 (2017) pp. 278–296. doi: [10.1002/ecm.1246](https://doi.org/10.1002/ecm.1246)

The separation of generations: Biology and biogeography of long-lived sporophyteless fern gametophytes

J. B. PINSON, S. M. CHAMBERS, J. H. NITTA, L.-Y. KUO, E. B. SESSA

International Journal of Plant Sciences 178.1 (2017) pp. 1–18. doi: [10.1086/688773](https://doi.org/10.1086/688773)

A plastid phylogeny and character evolution of the Old World fern genus *Pyrrosia* (Polypodiaceae) with the description of a new genus: *Hovenkampia* (Polypodiaceae)

X.-M. ZHOU, L. ZHANG, C.-W. CHEN, C.-X. LI, Y.-M. HUANG, D.-K. CHEN, N. T. THI, D. CICUZZA, R. KNAPP, T. T. TAM, J. H. NITTA, X.-F. GAO, L.-B. ZHANG

Molecular Phylogenetics and Evolution 114 (2017) pp. 271–294. doi: [10.1016/j.ympev.2017.06.020](https://doi.org/10.1016/j.ympev.2017.06.020)

Fern species richness and abundance are indicators of climate change on high-elevation islands: evidence from an elevational gradient on Tahiti (French Polynesia)

R. POUTEAU, J.-Y. MEYER, P. BLANCHARD, J. H. NITTA, M. TEROROTUA, R. TAPUTUARAI

Climatic Change 138 (2016) pp. 143–156. doi: [10.1007/s10584-016-1734-x](https://doi.org/10.1007/s10584-016-1734-x)

***Antrophyum solomonense* (Pteridaceae), a new species from the Solomon Islands, and its systematic position based on phylogenetic analysis**

C.-W. CHEN, J. H. NITTA, M. FANERII, T. Y. A. YANG, F. PITISOPA, C. W. LI, W.-L. CHIOU

Systematic Botany 40.3 (2015) pp. 645–651. doi: [10.1600/036364415X689357](https://doi.org/10.1600/036364415X689357)

A survey of the fern gametophyte flora of Japan: Frequent independent occurrences of noncordiform gametophytes

A. EBIHARA, A. YAMAOKA, N. MIZUKAMI, A. SAKODA, J. H. NITTA, R. IMAICHI

American Journal of Botany 100.4 (2013) pp. 735–743. doi: [10.3732/ajb.1200555](https://doi.org/10.3732/ajb.1200555)

Reticulate evolution in the *Crepidomanes minutum* species complex (Hymenophyllaceae)

J. H. NITTA, A. EBIHARA, M. ITO

American Journal of Botany 98.11 (2011) pp. 1782–1800. doi: [10.3732/ajb.1000484](https://doi.org/10.3732/ajb.1000484)

Pteridophytes of Mo'orea, French Polynesia: Additional new records

J. H. NITTA, J.-Y. MEYER, A. R. SMITH

American Fern Journal 101.1 (2011) pp. 36–49. doi: [10.1640/0002-8444-101.1.36](https://doi.org/10.1640/0002-8444-101.1.36)

Molecular species identification with rich floristic sampling: DNA barcoding the pteridophyte flora of Japan

A. EBIHARA, J. H. NITTA, M. ITO

PLoS ONE 5.12 (2010) e15136. doi: [10.1371/journal.pone.0015136](https://doi.org/10.1371/journal.pone.0015136)

The Hymenophyllaceae of the Pacific area. 2. *Hymenophyllum* (excluding subgen. *Hymenophyllum*)

A. EBIHARA, J. H. NITTA, K. IWATSUKI

Bulletin of the National Museum of Nature and Science, Series B (Botany) 36.2 (2010) pp. 43–59

New records of *Polyphlebium borbonicum*, an African filmy fern, in the New World and Polynesia

A. EBIHARA, J. H. NITTA, D. LORENCE, J.-Y. DUBUISSON

American Fern Journal 99.3 (2009) pp. 200–206. doi: [10.1640/0002-8444-99.3.200](https://doi.org/10.1640/0002-8444-99.3.200)

Hemi-epiphytism in *Vandenboschia collariata* (Hymenophyllaceae)

J. H. NITTA, M. J. EPPS

Brittonia 61.4 (2009) pp. 392–397. doi: [10.1007/s12228-009-9097-5](https://doi.org/10.1007/s12228-009-9097-5)

Exploring the utility of three plastid loci for biocoding the filmy ferns (Hymenophyllaceae) of Moorea

J. H. NITTA

Taxon 57.3 (2008) pp. 725–736. doi: [10.1002/tax.573006](https://doi.org/10.1002/tax.573006)

Mitochondrial phylogeny of the endemic Hawaiian craneflies (Diptera, Limoniidae, *Dicranomyia*): Implications for biogeography and species formation

J. H. NITTA, P. O'GRADY

Molecular Phylogenetics and Evolution 46.3 (2008) pp. 1182–1190. doi: [10.1016/j.ympev.2007.12.021](https://doi.org/10.1016/j.ympev.2007.12.021)

Presentations

ORAL

An open and continuously updated Fern Tree of Life (FTOL)

Madison, WI (online)

J. H. NITTA, E. SCHUETTELPELZ, S. RAMÍREZ-BARAHONA, W. IWASAKI

2022

30th Conference on Intelligent Systems for Molecular Biology

- Best Talk, EvolCompGen COSI

DNA Barcoding of Fern Gametophytes: Past, present, and future

Calicut, India (online)

J. H. NITTA

2022

16th Conference of the Indian Fern Society and International Symposium

- Invited speaker

Phylogenetic systematics and community assembly processes in ferns

Online

J. H. NITTA

2022

21st Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)

- Young Scientist Award Lecture

The open fern tree of life: Towards a continuously updated global fern phylogeny

Online

J. H. NITTA, W. IWASAKI

2021

20th Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)

- Best Oral Presentation Award

Intergenerational niche differentiation in filmy ferns

Hachioji, Japan (online)

J. H. NITTA, J. E. WATKINS, N. M. HOLBROOK, T. W. WANG., C. C. DAVIS

2021

85th Annual Meeting of the Botanical Society of Japan (*In Japanese*)

Exploring dimensions of biodiversity in Japanese ferns

Nagoya, Japan (online)

J. H. NITTA, B. MISHLER, W. IWASAKI, A. EBIHARA

2020

84th Annual Meeting of the Botanical Society of Japan (*In Japanese*)

Exploring dimensions of biodiversity in Japanese ferns

Anchorage, AK (online)

J. H. NITTA, B. MISHLER, W. IWASAKI, A. EBIHARA

2020

Botanical Society of America Conference

Biogeography of Polynesian pteridophytes in a global context

New Haven, CT

J. H. NITTA, A. WHITE, W. WAGNER, E. SCHUETTELPELZ

2019

3rd Annual Digital Data Conference

Sequence capture of Eupolypod II ferns: Applications at deep and shallow phylogenetic levels

Hachioji, Japan

J. H. NITTA, A. EBIHARA

2019

18th Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)

- Applying next-generation DNA sequencing to resolve the *Thelypteris angustifrons* species complex (Thelypteridaceae)** Taipei, Taiwan
- J. H. NITTA, N. NAKATO, A. EBIHARA 2018
7th Asian Symposium of Ferns and Lycophytes
- Fern community assembly on Moorea and Tahiti: Comparing gametophytes and sporophytes** Kyoto, Japan
- J. H. NITTA, J.-Y. MEYER, R. TAPUTUARAI, C. C. DAVIS 2017
16th Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)
- Fern flora of Moorea and Tahiti, French Polynesia: Community analysis using DNA barcodes** Noda, Japan
- J. H. NITTA 2017
Japan Pteridological Society Meeting (*In Japanese*)
• Invited speaker
- Life in the canopy: Comparative and community phylogenetic analyses of epiphytic growth in ferns** Shenzhen, China
- J. H. NITTA, J. E. WATKINS, N. M. HOLBROOK, C. C. DAVIS 2017
19th International Botanical Congress
- Unraveling the evolutionary history of the *Parathelypteris angustifrons* species complex (Thelypteridaceae)** Shenzhen, China
- J. H. NITTA, N. NAKATO, A. EBIHARA 2017
19th International Botanical Congress
- Life cycle matters: Divergent patterns of community structure between fern sporophytes and gametophytes** Washington, DC
- J. H. NITTA, J.-Y. MEYER, R. TAPUTUARAI, C. C. DAVIS 2015
Next Generation Pteridology Conference
- Life cycle matters: Divergent patterns of community structure between fern sporophytes and gametophytes** Edmonton, Canada
- J. H. NITTA, J. E. WATKINS, N. M. HOLBROOK, C. C. DAVIS 2015
Botanical Society of America Conference
- POSTER
- The taxastand R package for resolving species names rapidly and accurately** Online
- J. H. NITTA, W. IWASAKI 2022
21st Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)
- canaper: Categorical analysis of neo- and paleo-endemism in R** Online
- J. H. NITTA 2021
Botanical Society of America Conference
- DNA barcode analysis of the pteridophyte flora of Nectandra Cloud Forest Reserve, Costa Rica.** Kanazawa, Japan
- J. H. NITTA, A. EBIHARA, A. R. SMITH 2018
17th Annual Meeting of the Japanese Society for Plant Systematics (*In Japanese*)
- A new hybrid fern species of *Microsorium* (Polypodiaceae) from Moorea, French Polynesia** Noda, Japan
- J. H. NITTA, S. AMER, C. C. DAVIS 2017
81st Annual Meeting of the Botanical Society of Japan (*In Japanese*)
- Comparative ecophysiology of the filmy ferns (Hymenophyllaceae) of Moorea, French Polynesia** Edmonton, Canada
- J. H. NITTA, J. E. WATKINS, N. M. HOLBROOK, C. C. DAVIS 2015
Botanical Society of America Conference

Investigating the role of a cryptic life stage in fern community assembly

J. H. NITTA, C. C. DAVIS

9th Plant Biology Initiative Conference

Cambridge, MA

2014

Investigating drivers of community assembly in the ferns of Moorea, French Polynesia: An ecological and evolutionary approach

J. H. NITTA, C. C. DAVIS

7th Plant Biology Initiative Conference

Cambridge, MA

2012

Reticulate evolution in the *Crepidomanes minutum* species complex

J. H. NITTA, A. EBIHARA, M. ITO

41st Species Biology Conference (*In Japanese*)

Hachioji, Japan

2009

Community Activity

VOLUNTEER ROLES

2022 - **Subject Editor**, *PhytoKeys*

2020 - **Editorial Board Member**, *Journal of Plant Research*

2018 - **Team Member**, [Software Carpentry Japanese translation team](#)

2017 - **Subject Editor**, *Phytotaxa*

SOCIETY MEMBERSHIP

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*