

Data citation for humans and machines: the perspective from Dryad and DataCite



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Aydin Z, Marcussen T, Ertekin AS, Oxelman B (2014) Data from: Marginal likelihood estimate comparisons to obtain optimal species delimitations in *Silene* sect. *Cryptoneurae* (*Caryophyllaceae*). *PLoS ONE* <http://dx.doi.org/10.5061/dryad.nj984>

Quintela M, Skaug HJ, Øien N, Haug T, Seluksen BB, Solvang HK, Pampoulie C, Kanda N, Pastene LA, Glover KA (2014) Data from: Investigating population genetic structure in a highly mobile marine organism: the minke whale *Balaenoptera acutorostrata acutorostrata* in the North East Atlantic. *PLoS ONE* <http://dx.doi.org/10.5061/dryad.6r4gg>

Hanwella R, Jayasekera NELW, de Silva VA (2014) Data from: Mental health status of Sri Lanka Navy personnel three years after end of combat operations: a follow up study. *PLoS ONE* <http://dx.doi.org/10.5061/dryad.j1r30>

Johnson MG, Granath G, Tahvanainen T, Pouliot R, Stenøien HK, Rochefort L, Rydin H, Shaw A.I (2014) Data from: Evolution of niche preference in *Sphagnum* peat mosses

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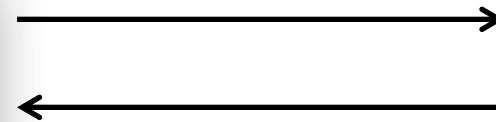
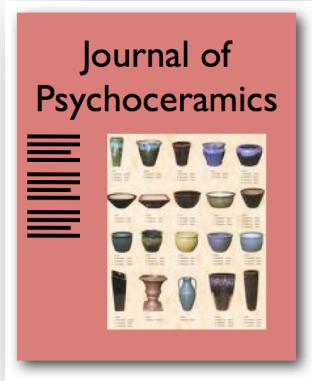


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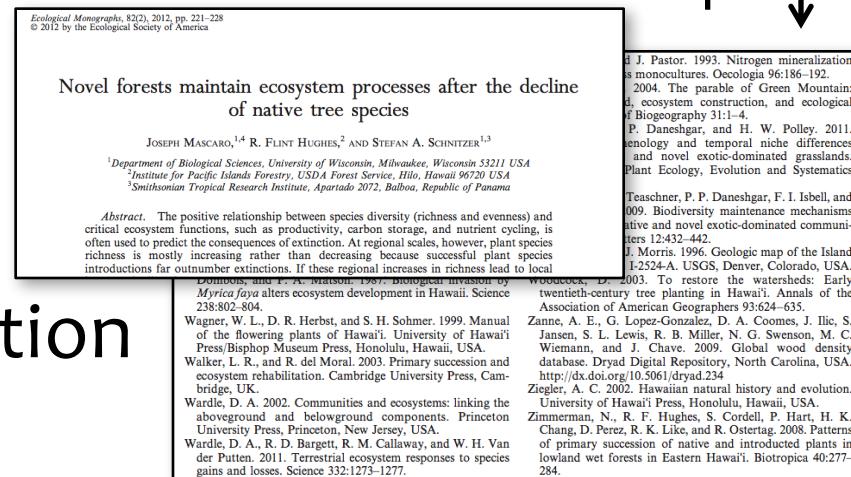
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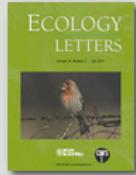
Data



Reuse publication



Data from: Towards a worldwide wood economics spectrum



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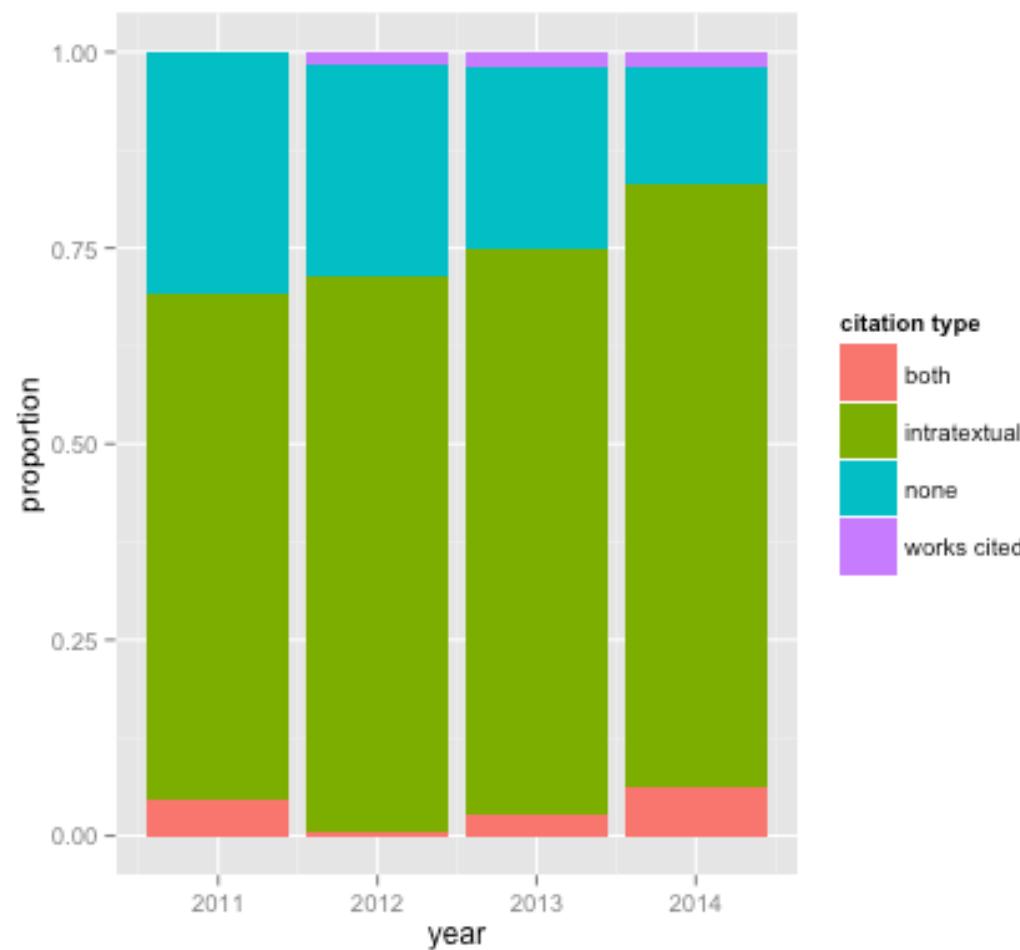
Chave J, Coomes DA, Jansen S, Lewis SL, Swenson NG, Zanne AE (2009) Towards a worldwide wood economics spectrum. *Ecology Letters* 12(4): 351-366. [doi:10.1111/j.1461-0248.2009.01285.x](https://doi.org/10.1111/j.1461-0248.2009.01285.x)

Additionally, please cite the Dryad data package:

Zanne AE, Lopez-Gonzalez G, Coomes DA, Ilic J, Jansen S, Lewis SL, Miller RB, Swenson NG, Wiemann MC, Chave J (2009) Data from: Towards a worldwide wood economics spectrum. Dryad Digital Repository. [doi:10.5061/dryad.234](https://doi.org/10.5061/dryad.234)

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Cites and references from *original* articles to data: highly variable (for both humans and machines)



Mayo, Hull and Vision (2016) Proc. of the 11th International Digital Curation Conference
<http://doi.org/10.5281/zenodo.32412>

Data referenced in reuse articles: human readable when present, but even more rare

Ecological Monographs, 82(2), 2012, pp. 221–228
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Novel forests maintain ecosystem processes after the decline of native tree species

JOSEPH MASCARO,^{1,4} R. FLINT HUGHES,² AND STEFAN A. SCHNITZER^{1,3}

¹Department of Biological Sciences, University of Wisconsin, Milwaukee, Wisconsin 53211 USA

²Institute for Pacific Islands Forestry, USDA Forest Service, Hilo, Hawaii 96720 USA

³Smithsonian Tropical Research Institute, Apartado 2072, Balboa, Republic of Panama

Abstract. The positive relationship between species diversity (richness and evenness) and critical ecosystem functions, such as productivity, carbon storage, and nutrient cycling, is often used to predict the consequences of extinction. At regional scales, however, plant species richness is mostly increasing rather than decreasing because successful plant species introductions far outnumber extinctions. If these regional increases in richness lead to local

Dombois, and P. A. Matson. 1987. Biological invasion by *Myrica faya* alters ecosystem development in Hawaii. *Science* 238:802–804.

Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1999. Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu, Hawaii, USA.

Walker, L. R., and R. del Moral. 2003. Primary succession and ecosystem rehabilitation. Cambridge University Press, Cambridge, UK.

Wardle, D. A. 2002. Communities and ecosystems: linking the aboveground and belowground components. Princeton University Press, Princeton, New Jersey, USA.

Wardle, D. A., R. D. Barlett, R. M. Callaway, and W. H. Van der Putten. 2011. Terrestrial ecosystem responses to species gains and losses. *Science* 332:1273–1277.

Woodcock, D. 2003. To restore the watersheds: Early twentieth-century tree planting in Hawai'i. *Annals of the Association of American Geographers* 93:624–635.

Zanne, A. E., G. Lopez-Gonzalez, D. A. Coomes, J. Ilic, S. Jansen, S. L. Lewis, R. B. Miller, N. G. Swenson, M. C. Wiemann, and J. Chave. 2009. Global wood density database. Dryad Digital Repository, North Carolina, USA. <http://dx.doi.org/10.5061/dryad.234>

Ziegler, A. C. 2002. *Hawaiian natural history and evolution*. University of Hawai'i Press, Honolulu, Hawaii, USA.

Zimmerman, N., R. F. Hughes, S. Cordell, P. Hart, H. K. Chang, D. Perez, R. K. Like, and R. Ostertag. 2008. Patterns of primary succession of native and introduced plants in lowland wet forests in Eastern Hawai'i. *Biotropica* 40:277–284.

Linking from data to *original* publication: Machine readable via DataCite DOI

doi:10.5061/DRYAD.2B65B

This page represents DataCite's metadata for *doi:10.5061/DRYAD.2B65B*.

For a landing page of this dataset please follow <http://dx.doi.org/10.5061/DRYAD.2B65B>

Citation da Silva, Luis; Pereira Coutinho, António Xavier; Heleno, Ruben; Tenreiro, Paulo; Ramos, Jaime; (2015): Data from: Dispersal of fungi spores by non-specialized flower-visiting birds; Dryad Digital Repository.
<http://dx.doi.org/10.5061/DRYAD.2B65B> [RIS](#) [BIBTeX](#)

Resource type

Dataset DataPackage

Subjects Fungi dispersal
Directed dispersal
Flower visitation

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Related identifiers

HasPart [doi:10.5061/DRYAD.2B65B/1](http://dx.doi.org/10.5061/DRYAD.2B65B/1)

IsReferencedBy [doi:10.1111/JAV.00806](http://dx.doi.org/10.1111/JAV.00806)

Linking from original publication to data: Can be achieved by machines even with only the DataCite DOI

The screenshot shows a ScienceDirect article page for "Molecular Phylogenetics and Evolution". The article title is "Molecular systematics of armadillos (Xenarthra, Dasypodidae): contribution of maximum likelihood and Bayesian analyses of mitochondrial and nuclear genes". The authors are Frédéric Delsuc^a, Michael J Stanhope^b, and Emmanuel J.P. Douzery^a. The article is from Volume 28, Issue 2, August 2003, Pages 261–275. The DOI is [http://dx.doi.org/10.1016/S1055-7903\(03\)00111-8](http://dx.doi.org/10.1016/S1055-7903(03)00111-8). A yellow box highlights the "Data for this Article" section, which links to DRYAD. The page also includes a sidebar with a search bar, user access information, and social sharing options.

Links from data to data: nice, but spotty and laborious

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Mol Ecol. 2011 Feb;20(3):584-600. doi: 10.1111/j.1365-294X.2010.04953.x. Epub 2010 Dec 16.

Comparative phylogeography, genetic differentiation and contrasting reproductive modes in three fungal symbionts of a multipartite bark beetle symbiosis.

Roe AD, Rice AV, Colman DW, Cooke JE, Sperling FA.

Department of Biological Sciences, University of Alberta, Edmonton, AB, Canada. amandaroe5@gmail.com

Abstract

Multipartite symbioses are complex symbiotic relationships involving multiple interacting partners. These types of partnerships provide excellent opportunities in which to apply a comparative approach to identify common historical patterns of population differentiation and species-specific life history traits. Using three symbiotic blue-stain fungal species (Ophiostomataceae) associated with outbreaks of the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) in western Canada, we applied phylogenetic, population genetic and demographic approaches to clarify phylogeographic patterns among the three fungal and southern populations, despite dramatic differences in recombination rate and ecological traits that challenge a comparative approach to partners of a multipartite symbiosis. These results help us to understand the complexity and evolution of multipartite symbioses.

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PMID: 21166729 [PubMed - indexed for MEDLINE]

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Send to:

Ophiostoma montium isolate ss547 5.8S ribosomal RNA gene, partial sequence; internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence

GenBank: HQ413650.1

FASTA Graphics PopSet

Go to:

LOCUS HQ413650 918 bp DNA linear PLN 20-JAN-2011

DEFINITION Ophiostoma montium isolate ss547 5.8S ribosomal RNA gene, partial sequence; internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence.

ACCESSION HQ413650

VERSION HQ413650.1 GI:316925971

KEYWORDS

SOURCE Ophiostoma montium

ORGANISM [Ophiostoma montium](#)
Eukaryota; Fungi; Dikarya; Ascomycota; Pezizomycotina; Sordariomycetes; Sordariomycetidae; Ophiostomatales; Ophiostomataceae; Ophiostoma.

REFERENCE 1 (bases 1 to 918)

AUTHORS Roe,A.D., Rice,A.V., Colman,D.W., Cooke,J.E. and Sperling,F.A.

TITLE Comparative phylogeography, genetic differentiation and contrasting reproductive modes in three fungal symbionts of a multipartite bark beetle symbiosis

JOURNAL Mol. Ecol. 20 (3), 584-600 (2011)

PUBMED [21166729](#)

REFERENCE 2 (bases 1 to 918)

AUTHORS Roe,A.D., Rice,A.V., Colman,D.W., Cooke,J.E.K. and Sperling,F.A.H.

TITLE Direct Submission

LINKOUT TO EXTERNAL RESOURCES

SILVA LSU Database [SILVA]

Dryad Digital Repository [Repository]

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Dancing together and separate again: gymnosperms exhibit frequent changes of fundamental 5S and 35S rRNA gene (rDNA) organisation.
(PMID:23512008)

Abstract  Citations  BioEntities  Related Articles  External Links 

Garcia S, Kovářík A
Laboratori de Botànica, Facultat de Farmàcia, Universitat de Barcelona, Barcelona, Catalonia, Spain.
Heredity [2013, 111(1):23-33]

Type: Journal Article, Research Support, Non-U.S. Gov't
DOI: 10.1038/hdy.2013.11 

Abstract

In higher eukaryotes, the (S-type arrangement) or L 18S-5.8S-26S genes (L-type arrangement) are found in all groups, including Conifer species (21 genera). The Coniferales and in Ginkgo organisation. The linked 5S genes are embedded in the 26S-18S genes in the same (Ginkgo, Ephedra) addition, pseudogenised have been largely homologous. Comparison of 5S coding three times in the course basic units indicate relatively conserved genes in plants.

Dancing together and separate again: gymnosperms exhibit frequent changes of fundamental 5S and 35S rRNA gene (rDNA) organisation.
(PMID:23512008)

Abstract  Citations  BioEntities  Related Articles  External Links 

Dryad Digital Repository
Dryad is a nonprofit organization and an international repository of data underlying scientific and medical publications.

- Data from: **Dancing together and separate again: gymnosperms exhibit frequent changes of fundamental 5S and 35S rRNA genes (rDNA) organisation**
<http://dx.doi.org/doi:10.5061/dryad.fq228>

Cites from any publication to data: can be achieved via text mining

Combining links through DataCite



Works Contributors Data Centers Members Sources grid Todd J Vision

Data from: Social networks predict gut microbiome composition in wild baboons

Jenny Tung, Luis B. Barriero, Michael B. Burns, J. C. Grenier, Josh Lynch, L. E. Grieneisen ... & E. A. Archie

Dataset published 2016 via Dryad Digital Repository

Europe PMC (Fulltext) (1)

<http://doi.org/10.5061/DRYAD.8GP03>

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Social networks predict gut microbiome composition in wild baboons

Work published March 16, 2015

References <http://doi.org/10.5061/DRYAD.8GP03>

DataCite (Crossref)

<http://doi.org/10.7554/ELIFE.05224> Cite

Mica_1yrproximity

Work published 2016

Is part of <http://doi.org/10.5061/DRYAD.8GP03>

DataCite (RelatedIdentifier)

<http://doi.org/10.5061/DRYAD.8GP03.2/10.2> Cite Add to ORCID record

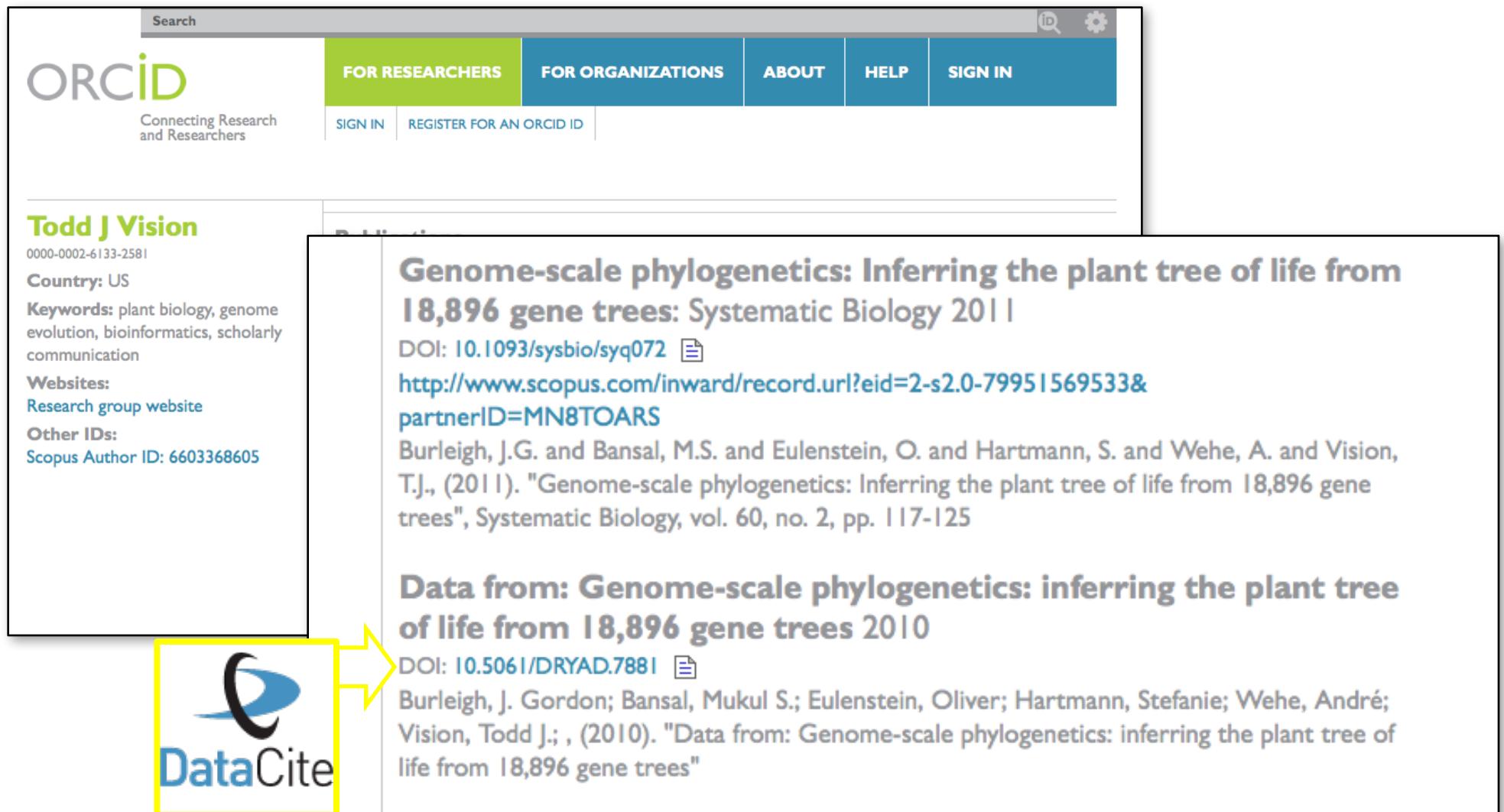
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- DataCite (Crossref) 1

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- References 1

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Keywords: plant biology, genome evolution, bioinformatics, scholarly communication
Websites:
Research group website
Other IDs:
Scopus Author ID: 6603368605

Genome-scale phylogenetics: Inferring the plant tree of life from 18,896 gene trees: Systematic Biology 2011
DOI: [10.1093/sysbio/syq072](https://doi.org/10.1093/sysbio/syq072) 
<http://www.scopus.com/inward/record.url?eid=2-s2.0-79951569533&partnerID=MN8TOARS>
Burleigh, J.G. and Bansal, M.S. and Eulenstein, O. and Hartmann, S. and Wehe, A. and Vision, T.J., (2011). "Genome-scale phylogenetics: Inferring the plant tree of life from 18,896 gene trees", Systematic Biology, vol. 60, no. 2, pp. 117-125

Data from: Genome-scale phylogenetics: inferring the plant tree of life from 18,896 gene trees 2010
DOI: [10.5061/DRYAD.7881](https://doi.org/10.5061/DRYAD.7881) 
Burleigh, J. Gordon; Bansal, Mukul S.; Eulenstein, Oliver; Hartmann, Stefanie; Wehe, André; Vision, Todd J.; , (2010). "Data from: Genome-scale phylogenetics: inferring the plant tree of life from 18,896 gene trees"

A structured citation from a reuse article to data: are we meeting the needs of both humans and machines?

Methods

Analysis of patterns of sex chromosome-autosome fusions in vertebrates

We compiled lists of species with multiple sex chromosome systems (X_1X_2Y , XY_1Y_2 , ZW_1W_2 , and Z_1Z_2W systems) from the Tree of Sex database [17]. Although X_1X_2Y systems (or ZW_1W_2 systems) can also arise from species with XO (or ZO) systems through a reciprocal translocation between an X (or a Z) and an autosome [2,20], XO or ZO systems are rare in vertebrates [17] (Table 1). In addition, although fission of sex chromosomes can also create multiple sex chromosome systems [2,20], such fissions are also rare in vertebrates [18,20,21]. We therefore focus this discussion on fusions, although the data analysis allowed fissions as well as fusions (S1 Text).

16. Devlin RH, Nagahama Y (2002) Sex determination and sex differentiation in fish: an overview of genetic, physiological, and environmental influences. *Aquaculture* 208: 191–364.
17. The Tree of Sex Consortium (2014) Tree of Sex: a database of sexual systems. *Sci Data* 1: 140015.
18. Ohno S (1967) Sex chromosomes and sex-linked genes. New York: Springer.

Data Availability Statement: Sex chromosome data are available from the Dryad (<http://dx.doi.org/10.5061/dryad.v1908>). Analytical tools and code are available in the Supporting Information file (S2 Text) or at <https://github.com/mwpennell/fuse>.

Pennell MW et al. (2015) Y Fuse? Sex Chromosome Fusions in Fishes and Reptiles. *PLoS Genet* doi:10.1371/journal.pgen.1005237



- Sustainable services
 - Building upon trusted identifier services
 - ORCID-DataCite claiming service
 - DataCite Event Data: <http://eventdatacite.datacite.org>
 - DataCite Search (by ORCID, funder, etc): <http://search.datacite.org/>
- Research
 - On gaps in workflows, metadata interoperability
 - Example: Funding metadata
 - Another example: organizational identifiers: <https://project-thor.eu/2016/06/06/>
- Community building
 - Knowledge Hub
 - <https://project-thor.readme.io>
 - Ambassador program
 - <http://project-thor.eu/become-an-ambassador/>



- Sustainable services
 - Building upon trusted identifier services
 - ORCID, DOI, CrossCheck, ...
 - DataCite
 - DataCite

- Research

- On going
 - Examples
 - Another

- Community

- Known
 - Ambassadors
 - Ambassadors



Todd Carpenter
@TAC_NISO

Because nothing is more rock
and roll than identifiers! @gbilder
#force2016

1:57pm · 17 Apr 2016 · TweetDeck

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Other DataCite services: repository registry



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National Pollutant Release Inventory
Inventaire national des rejets de polluants

Subject(s)

Atmospheric Science
Analytical Chemistry, Method Development (Chemistry)
Technical Chemistry
Geochemistry, Mineralogy and Crystallurgy
Atmospheric Science and Oceanography
Geosciences (including Geography)
Natural Sciences
Chemistry
Process Engineering, Technical Chemistry
Thermal Engineering/Process Engineering
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Content type(s)

Standard office documents
Scientific and statistical data formats
Databases
Software applications
other

Country

Canada

The National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases (to air, water and land), disposals and transfers for recycling. It is a key resource for: identifying pollution prevention priorities; supporting the assessment and risk management of chemicals, and air quality modelling; helping develop targeted regulations for reducing releases of toxic substances and air pollutants; encouraging actions to reduce the release of pollutants into the environment; and improving public understanding. The NPRI comprises: Information reported by facilities and published by Environment Canada under the authority of Sections 46 – 50 of the Canadian Environmental Protection Act, 1999 (CEPA 1999); and Comprehensive emission summaries and trends for key air pollutants, based on facility-reported data and emission estimates for other sources such as motor vehicles, residential heating, forest fires and agriculture. For the latest reporting year, 7,708 facilities reported to the NPRI on more than 300 listed substances. Comprehensive air pollutant emission summaries and trends were compiled by Environment Canada for criteria air contaminants (the main pollutants contributing to smog, acid rain and/or poor air quality), selected heavy metals and persistent organic pollutants.