

Introduction to Persistent Identifiers (PIDs), FAIR Principles, DataCite

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July 20, 2023

"Unlocking repositories through persistent identifiers: enabling open research practices"

<https://doi.org/10.5281/zenodo.8170595>



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[@datacite](https://twitter.com/datacite)



Persistent identifiers (PIDs)

PIDs

What is a persistent identifier (PID)?

<https://doi.org/10.34848/GJO6SY>

Unique alphanumeric string referring to a digital resource.



<https://research-data.urosario.edu.co/dataset.xhtml?persistentId=doi:10.34848/GJO6SY>

*Always points to the same resource
(a metadata representation)*

DOIs for research outputs and resources

<https://doi.org/10.5281/zenodo.3630248>



ORCID iDs for researchers

<https://orcid.org/0000-0001-6622-4910>



ROR IDs for research organizations

<https://ror.org/01y2jtd41>



PIDs for people, places and things

**PIDs for people (researchers)
include ISNI and ORCID**



<https://orcid.org/0000-0001-6622-4910>



**PID for places (research
institutions) include ROR**



<https://ror.org/01y2jtd41>



**PIDs for things (research outputs and
resources) include DOIs, handles, IGSN,
ARK and more**



<https://doi.org/10.5061/dryad.708gr>



PIDs for People

▼ Works (14)

≡ Sort

Supporting Trusted OA Usage Data Reporting and Analytics through Shared Infrastructure

Zenodo
2023-06-14 | Other
DOI: [10.5281/zenodo.8094766](https://doi.org/10.5281/zenodo.8094766)
CONTRIBUTORS: Andrew Joseph; Jo Havemann; Elizabeth Krznarich; Christina Drummond

[Show more detail](#)

Source: DataCite

Supporting Trusted OA Usage Data Reporting and Analytics through Shared Infrastructure

Zenodo
2023-06-14 | Other
DOI: [10.5281/zenodo.8094765](https://doi.org/10.5281/zenodo.8094765)
CONTRIBUTORS: Andrew Joseph; Jo Havemann; Elizabeth Krznarich; Christina Drummond

[Show more detail](#)

Source: DataCite

Beyond data: Sharing related research outputs to make data reusable

Learned Publishing
2022-01 | Journal article
DOI: [10.1002/leap.1429](https://doi.org/10.1002/leap.1429)
CONTRIBUTORS: Helena Cousijn; Ted Habermann; Elizabeth Krznarich; Alice Meadows

[Show more detail](#)

Source: Crossref



Indian Institute of Science Bangalore

Wikidata Q948720

D0Is for research outputs


Journal article is just **one** part of the **scholarly record**.
Different **research outputs** should be **registered** with D0Is
such as protocols, datasets, dissertations, software,

VALUE


discoverable, accessible, citable, reusable



PIDs for research outputs

Journal article




[PUBLISH](#) [ABOUT](#) [BROWSE](#)


SEARCH 
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RESEARCH ARTICLE


Development of a method of passaging and freezing human iPS cell-derived hepatocytes to improve their functions

Jumpei Inui, Yukiko Ueyama-Toba, Seiji Mitani, Hiroyuki Mizuguchi 

Published: May 18, 2023 • <https://doi.org/10.1371/journal.pone.0285783> 

Article	Authors	Metrics	Comments	Media Coverage	Peer Review
					

0 Save	0 Citation
1,963 View	0 Share

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PIDs for research outputs

Dataset



Who we are

Data from: Towards robust evolutionary inference with integral projection models

Janeiro, M. J., University of St Andrews, University of Aveiro

Coltman, D. W.

Festa-Bianchet, M., University of Alberta

Pelletier, F., University of Alberta

Morrissey, M. B., University of St Andrews

Publication date: December 3, 2021

Publisher: Dryad

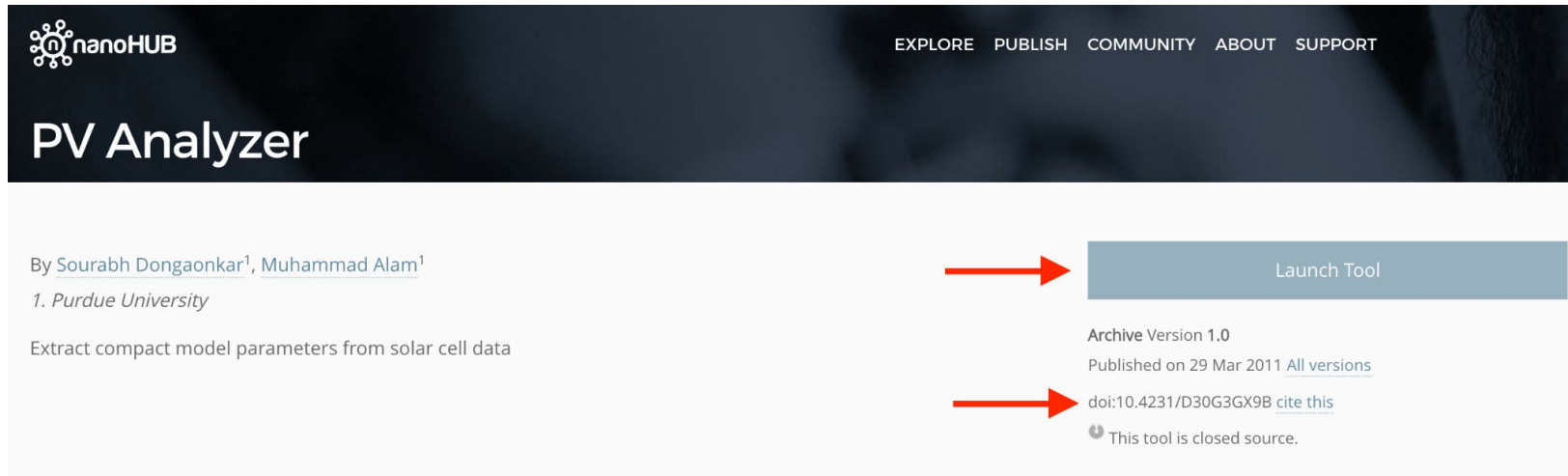
<https://doi.org/10.5061/dryad.708gr>

Citation

Janeiro, M. J. et al. (2021), Data from: Towards robust evolutionary inference with integral projection models, Dryad, Dataset, <https://doi.org/10.5061/dryad.708gr>



PIDs for research outputs Software



The screenshot shows the nanoHUB website interface for the 'PV Analyzer' tool. The header includes the nanoHUB logo and navigation links: EXPLORE, PUBLISH, COMMUNITY, ABOUT, and SUPPORT. The main title 'PV Analyzer' is prominently displayed. Below the title, the authors 'Sourabh Dongaonkar¹, Muhammad Alam¹' are listed, followed by their affiliation '1. Purdue University'. A brief description states: 'Extract compact model parameters from solar cell data'. On the right side, there is a 'Launch Tool' button, which is highlighted with a red arrow. Below the button, the version information is provided: 'Archive Version 1.0', 'Published on 29 Mar 2011', and a link to 'All versions'. A DOI link 'doi:10.4231/D30G3GX9B' is also present, with a red arrow pointing to it. A note at the bottom indicates 'This tool is closed source.'.

PV Analyzer

By [Sourabh Dongaonkar¹](#), [Muhammad Alam¹](#)
1. Purdue University

Extract compact model parameters from solar cell data

[Launch Tool](#)

Archive Version 1.0
Published on 29 Mar 2011 [All versions](#)
[doi:10.4231/D30G3GX9B](#) [cite this](#)
⚙️ This tool is closed source.



PIDs for research outputs

Preprint



Search

Arts

Applied science

COVID-19

Formal science

Humanities

Natural science

Interdisciplinary studies

Latest preprints

NLP-BASED FOOD SUGGESTIONS SYSTEM – SMART HOMES

Divya Mereddy

DOI: <https://doi.org/10.35543/indiarxiv.34>



Food Sysggestion System

Bert

Item Similarity

Downloads: 52 - Submitted 2023-02-13 - Posted 2023-03-28

 PDF



Registered resources with DataCite

Work Type


<input type="checkbox"/> Text	20,848,894
<input type="checkbox"/> Journal Article	16,982,789
<input type="checkbox"/> Dataset	14,712,383
<input type="checkbox"/> Physical Object	11,269,313
<input type="checkbox"/> Image	3,957,511
<input type="checkbox"/> Other	1,181,336
<input type="checkbox"/> Preprint	1,075,621
<input type="checkbox"/> Collection	915,420
<input type="checkbox"/> Book Chapter	767,127
<input type="checkbox"/> Software	412,954

FAIR Principles and PIDs

[nature](#) > [scientific data](#) > [comment](#) > [article](#)

[Open Access](#) | [Published: 15 March 2016](#)

The FAIR Guiding Principles for scientific data management and stewardship

[Mark D. Wilkinson](#), [Michel Dumontier](#), [IJsbrand Jan Aalbersberg](#), [Gabrielle Appleton](#), [Myles Axton](#), [Arie Baak](#), [Niklas Blomberg](#), [Jan-Willem Boiten](#), [Luiz Bonino da Silva Santos](#), [Philip E. Bourne](#), [Jildau Bouwman](#), [Anthony J. Brookes](#), [Tim Clark](#), [Mercè Crosas](#), [Ingrid Dillo](#), [Olivier Dumon](#), [Scott Edmunds](#), [Chris T. Evelo](#), [Richard Finkers](#), [Alejandra Gonzalez-Beltran](#), [Alasdair J.G. Gray](#), [Paul Groth](#), [Carole Goble](#), [Jeffrey S. Grethe](#), ... [Barend Mons](#)  [+ Show authors](#)

[Scientific Data](#) **3**, Article number: 160018 (2016) | [Cite this article](#)

610k Accesses | **6015** Citations | **2128** Altmetric | [Metrics](#)

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Associated Content

Collection

Scientific data

Collection

Metadata quality

Sections

References

[Abstract](#)

Making research data FAIR With PIDs



Findable

(Meta)data are assigned a globally unique and persistent identifier



Accessible

(Meta)data are retrievable via an identifier using a standardized protocol
Metadata are accessible, even when the data are no longer available



Interoperable

(Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.



Reusable

(Meta)data are richly described with a plurality of accurate & relevant attributes

Making research data FAIR With PIDs

The first step in (re)using data is to find them. Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the FAIRification process.

PID



Findable

(Meta)data are assigned a globally unique and persistent identifier

Making research data FAIR With PIDs

Once the user finds the required data, she/he/they need to know how they can be accessed, possibly including authentication and authorisation.



Accessible

(Meta)data are retrievable via an identifier using a standardized protocol
Metadata are accessible, even when the data are no longer available

Making research data FAIR With PIDs

The data usually need to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

PID



Interoperable

(Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.

Making research data FAIR With PIDs

The ultimate goal of FAIR is to optimise the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.



Reusable

(Meta)data are richly described with a plurality of accurate & relevant attributes

Persistent Identifier (PIDs)



Why are PIDs important?

PIDs like DOIs, ORCID iDs, ROR IDs increase the **discoverability, access, citation, reutilization, and recognition** of research outputs and resources



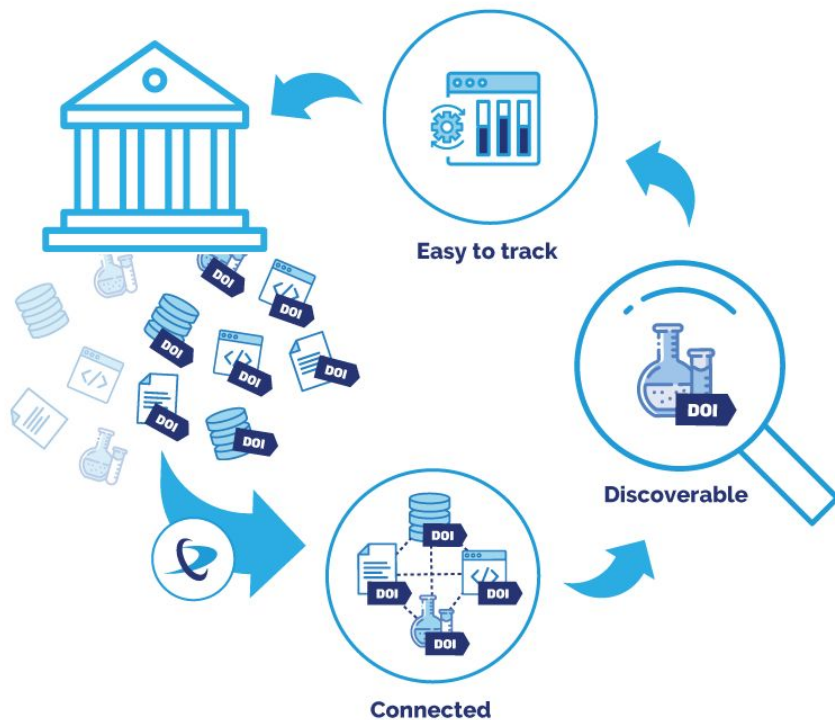
VALUE

DataCite

About DataCite

Our vision is to connect research and identify knowledge.

Non profit organization, created (2009) by and for the research community. We work with research institutions across 50 countries to provide the means to register, find, cite, connect and reuse research.



Our value



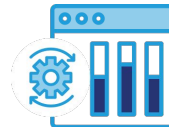
Registering DataCite DOIs and metadata to improve the discoverability and reuse of research outputs and resources

- DOI metadata registration and maintenance
- Content negotiation
- Link checking
- Public APIs for harvesting by third parties



Our services support best practice adoption for the community

- Simple interfaces and services, support documentation and dedicated staff.
- Best practice documentation
- Community coordination, full of passionate people who share experiences and support best practice adoption.
- Continued evolution of our metadata schema.



We continue to invest in tools and services to track the influence of research that transcends borders and domains

- Dashboards and analytics.
- Harvesting services.
- Graph APIs and relational metadata.

Our community



2889+

Repositories



280+

Members



50

Countries



51m+

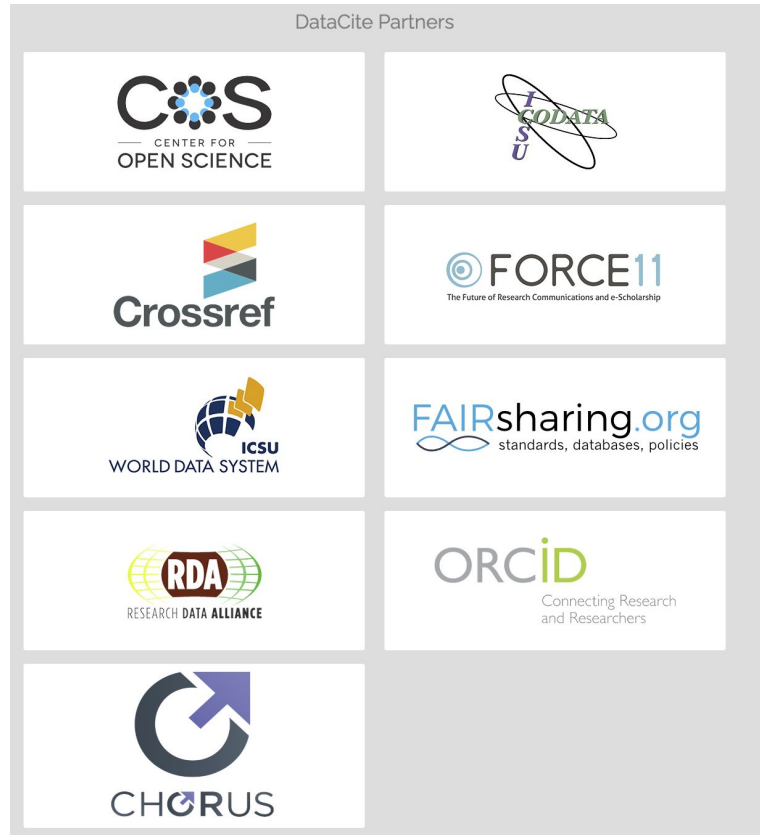
DOIs



1359+

Organizations

Our partners



Our initiatives



Partners in international projects

DOI Citation Formatter

Paste your DOI:

For example 10.1145/2783446.2783605

Please fill in this field.

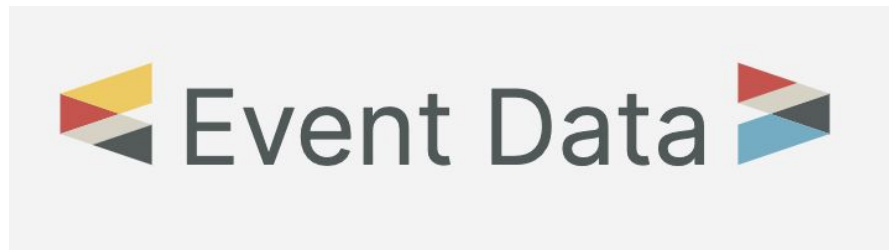
Select Formatting Style:

Begin typing (e.g. Chicago or IEEE.) or use the drop down menu.

Select Language and Country:

Begin typing (e.g. en-GB for English, Great Britain) or use the drop down menu.

Format

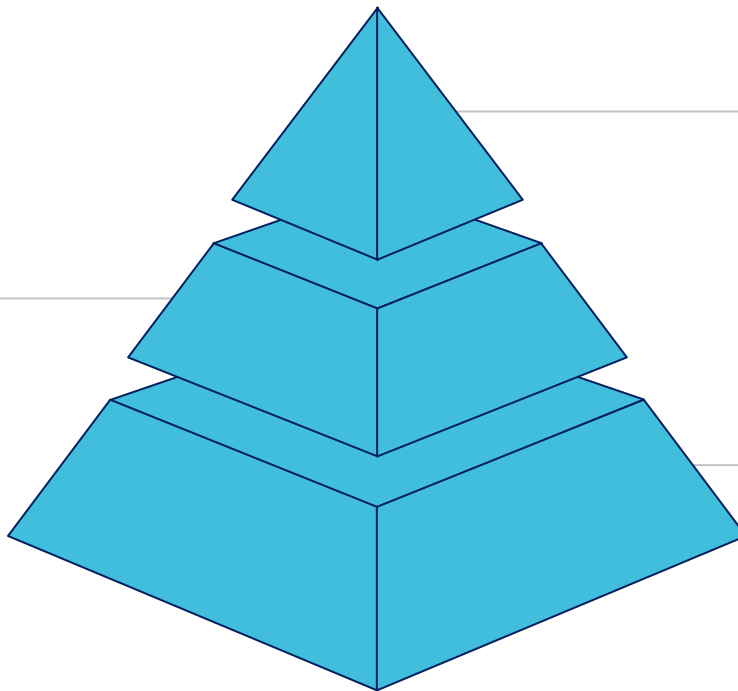


FAIR-IMPACT
Expanding FAIR solutions across EOSC

Collective effort

Adopt and implement best practices

- Simple interfaces and services, supporting documentation and dedicated staff.
- Documentation on best practices.
- Community coordination, full of passionate people who share experiences and support the adoption of best practices.
- Continuous evolution of our metadata schema.

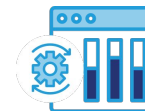


Measuring the influence of research with tools and services

- Dashboards and analytics
- Harvesting services
- Graph API and relational metadata discovery

Register DOIs and metadata to improve discovery and reuse of research results and resources.

- DOI and metadata registration and maintenance
- Content negotiation
- Link checking
- Public APIs for third-party harvesting
- Interoperable schema



Metadata schema



Add your DOI metadata following DataCite Metadata Schema

DataCite DOIs are suitable for a wide range of research outputs

Mandatory	Recommended	Optional
Identifier	Subject	Language
Creator	Contributor	AlternateIdentifier
Title	Date	Size
Publisher	RelatedIdentifier	Format
PublicationYear	Description	Version
ResourceType	GeoLocation	Rights
		FundingReference
		RelatedItem

Resource types

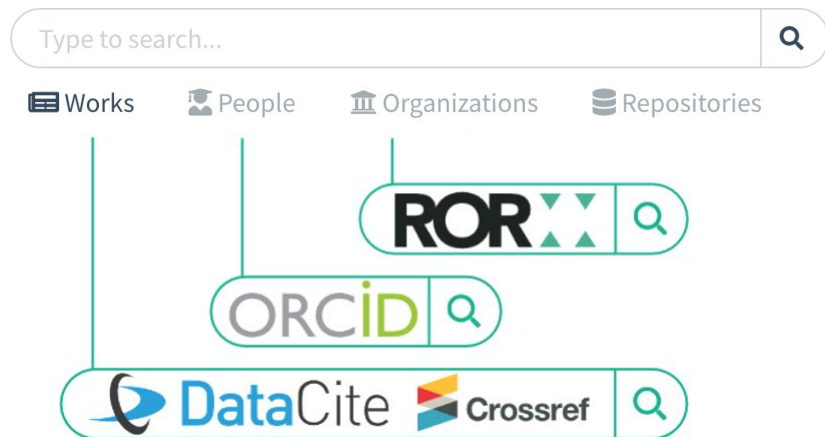
Audiovisual	Model
Book	OutputManagementPlan
BookChapter	PeerReview
Collection	PhysicalObject
ComputationalNotebook	Preprint
ConferencePaper	Report
ConferenceProceeding	Service
DataPaper	Software
Dataset	Sound
Dissertation	Standard
Event	Text
Image	Workflow
InteractiveResource	Other
Journal	
JournalArticle	

Connected research

Find and connect research



Find the research
with DataCite Commons



The PID Graph

Number of nodes and connections (August 2022)



Find a dataset



DataCite Commons

comparative analysis of the S-locus and nuclear SSR

Pages ▾

Support

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Works

People

Organizations

2 Works

Publication Year

☐ 2012 2

Work Type

☐ Dataset 1

☐ Text 1

License

☐ CC0-1.0 1

Language

☐ English 1

Registration Agency

☐ Crossref 1

☐ DataCite 1

Data from: Impact of negative frequency-dependent selection on mating pattern and genetic structure: a comparative analysis of the S-locus and nuclear SSR loci in *Prunus lannesiana* var. *speciosa*

Kato Shuri, Teruyoshi Nagamitsu, Hiroyoshi Iwata, Yoshihiko Tsumura, Yuzuru Mukai, K Michiharu, K Saika & K Junko

Version 1 of Dataset published 2012 in [DRYAD](#)

Mating processes of local demes and spatial genetic structure of island populations at the self-incompatibility (S-) locus under negative frequency-dependent selection (NFDS) were evaluated in *Prunus lannesiana* var. *speciosa* in comparison with nuclear simple sequence repeat (SSR) loci that seemed to be evolutionarily neutral. Our observations of local mating patterns indicated that male-female pair fecundity was influenced by not only self-incompatibility, but also various factors such as kinship, pollen production and flowering synchrony. In spite of the mating bias caused by these factors, the NFDS effect on changes in allele frequencies from potential mates to mating pollen was detected at the S-locus but not at the SSR loci although the changes from adult to juvenile cohorts were not apparent at any loci. Genetic differentiation and isolation-by-distance over various spatial scales were smaller at the S-locus than at the SSR loci, as expected under the NFDS. All ele sharing distributions among the populations also had a unimodal pattern at the S-locus, indicating the NFDS effect except for alleles unique to individual populations probably due to isolation among islands, although this pattern was not exhibited by the SSR loci. Our results suggest that the NFDS at the S-locus has an impact on both the mating patterns and the genetic structure in the *P. lannesiana* populations studied.

DOI registered April 17, 2012 via DataCite.



1 Citation 103 Views 16 Downloads

[Dataset](#)

[English](#)

<https://doi.org/10.5061/dryad.7c425>

Bring citations to the surface

1 Reference

1 Citation



**Impact of negative frequency-dependent selection on mating pattern and genetic structure:
a comparative analysis of the S-locus and nuclear SSR loci in *Prunus lannesiana* var. *speciosa***

K Shuri, K Saika, K Junko, K Michiharu, T Nagamitsu, H Iwata, Y Tsumura & Y Mukai

Journal Article published 2012 in [Heredity](#)

DOI registered via Crossref.

🗨️ 1 Citation

Journal Article

 <https://doi.org/10.1038/hdy.2012.29>

Support recognition

Data from: Impact of negative frequency-dependent selection on mating pattern and genetic structure: a comparative analysis of the S-locus and nuclear SSR loci in *Prunus lannesiana* var. *speciosa*

 <https://doi.org/10.5061/dryad.7c425>

 1 Citation  118 Views  16 Downloads

 Add to ORCID Record

Download Metadata

Cite as

Shuri, K., Nagamitsu, T., Iwata, H., Tsumura, Y., Mukai, Y., Michiharu, K., Saika, K., & Junko, K. (2012). Data from: Impact of negative frequency-dependent selection on mating pattern and genetic structure: a comparative analysis of the S-locus and nuclear SSR loci in *Prunus lannesiana* var. *speciosa* (Version 1) [Data set]. Dryad. <https://doi.org/10.5061/DRYAD.7C425>

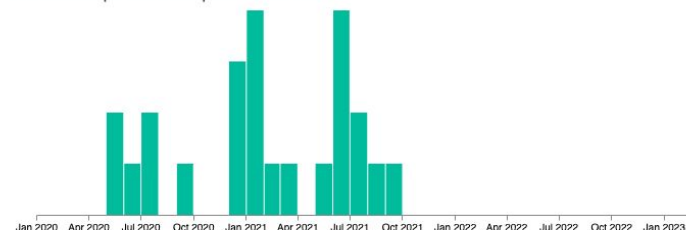
APA ▼

Description Creators Registration

Kato Shuri	Forestry and Forest Products Research Institute
Teruyoshi Nagamitsu	Forestry and Forest Products Research Institute
Hiro Yoshi Iwata	University of Tokyo
Yoshihiko Tsumura	Forestry and Forest Products Research Institute
Yuzuru Mukai	Gifu University
K Michiharu	Kyoto University
K Saika	Tokyo Institute of Technology
K Junko	Gunma University

118 Views 16 Downloads


118 views reported since publication in 2012.





Empowering discoverability

Discovery of DataCite DOIs Dimensions







KAUST Research Repository 

Repository


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Dataset


Effect of dust on rainfall over the Red Sea coast based on WRF-Chem model simulations


KAUST Research Repository, January 2022
<https://doi.org/10.25781/kaust-zz3wx> 

Posted by
Parajuli, Sagar P., Stenchikov, Georgiy L., Ukhov, Alexander, Mostamandi, Suleiman, Kucera, Paul, Axisa, Duncan, Gustafson, William, Zhu, Yannian


Associated publication

[Effect of dust on rainfall over the Red Sea coast based on WRF-Chem model simulations](#)
Sagar Prasad Parajuli, Georgiy L. Stenchikov, Alexander Ukhov, Suleiman Mostamandi, Paul A. Kucera, Duncan Axisa, William I. Gustafson, Yannian Zhu
2022, EGU sphere - Preprint

 1

 1

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Document history
2022-01-01 Published

Discovery of DataCite DOIs

Google Dataset Search



Saved datasets

1 dataset found

Data from: Three new species of Oppioidea (Acari: Oribatida) from India

commons.datacite.org

Updated Apr 14, 2016

Data from: Three new species of Oppioidea (Acari: Oribatida) from India

Related Article

Explore at: commons.datacite.org

Unique identifier
<https://doi.org/10.15468/agykyx>

Dataset updated
Apr 14, 2016

Dataset provided by
[DataCite](#)
Plazi

Authors
Plazi

Description
This dataset contains the digitized treatments in Plazi based on the original journal article Ermilov, Sergey G., Kalúz, Stanislav (2013): Three new species of Oppioidea (Acari: Oribatida) from India. Zootaxa 3670 (4): 482-492, DOI: <http://dx.doi.org/10.11646/zootaxa.3670.4.4>

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Discovery of DataCite DOIs

Data Citation Index, Clarivate



DISCOVERY AND WORKFLOW SOLUTIONS | WEB OF SCIENCE
PLATFORM

Data Citation Index

Connecting data to the research it informs

Discovery of DataCite DOIs



OpenAIRE Explore, Ex Libris/ProQuest,
and more ..



Useful resources

Useful Links

1. <https://datacite.org>
2. <https://datacite.org/global-access-program.html>
3. <https://datacite.org/roadmap.html>
4. <https://github.com/datacite>
5. <https://schema.datacite.org/>
6. <https://www.pidforum.org/>
7. <https://ror.org/registry/>
8. <https://support.datacite.org/>



CONNECTING RESEARCH,
IDENTIFYING KNOWLEDGE



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