



Global Biodiversity Information Facility

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GBIF

Global Biodiversity
Information Facility

Illustration: GBIF data portal

GBIF data seminar in Tromsø | 23rd May | 2024

WHY OPEN RESEARCH DATA?

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OPPORTUNITIES

- Enables **new research methodologies** that were not possible before.
- Skills for open research and open data are in **increasing demand!**
- Funding opportunities.
- GBIF brings **new benefits and opportunities** for our museums.

WHY OPEN RESEARCH DATA?

- ❖ We are in the middle of an ongoing **paradigm shift** in scientific practice (*and impact metrics*).
- ❖ Marine science will also need to develop **different approaches**, than they needed in the past – *to remain relevant*.
- ❖ Society is gaining Big Data maturity and will **expect new services** from marine sciences.
- ❖ The open science wave is moving **fast**!

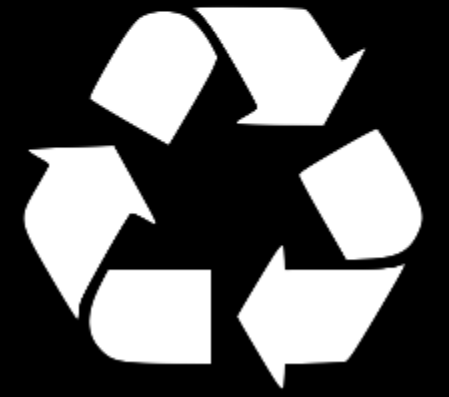


F
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R
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FAIR data is about **machine-readable** data

*researchers need to do more than simply post their data on the web for it to be **re-usable**.*

FAIR DATA PRINCIPLES



Be

FAIR

Findable Accessible Interoperable Reusable

and

CARE

Collective
Benefit

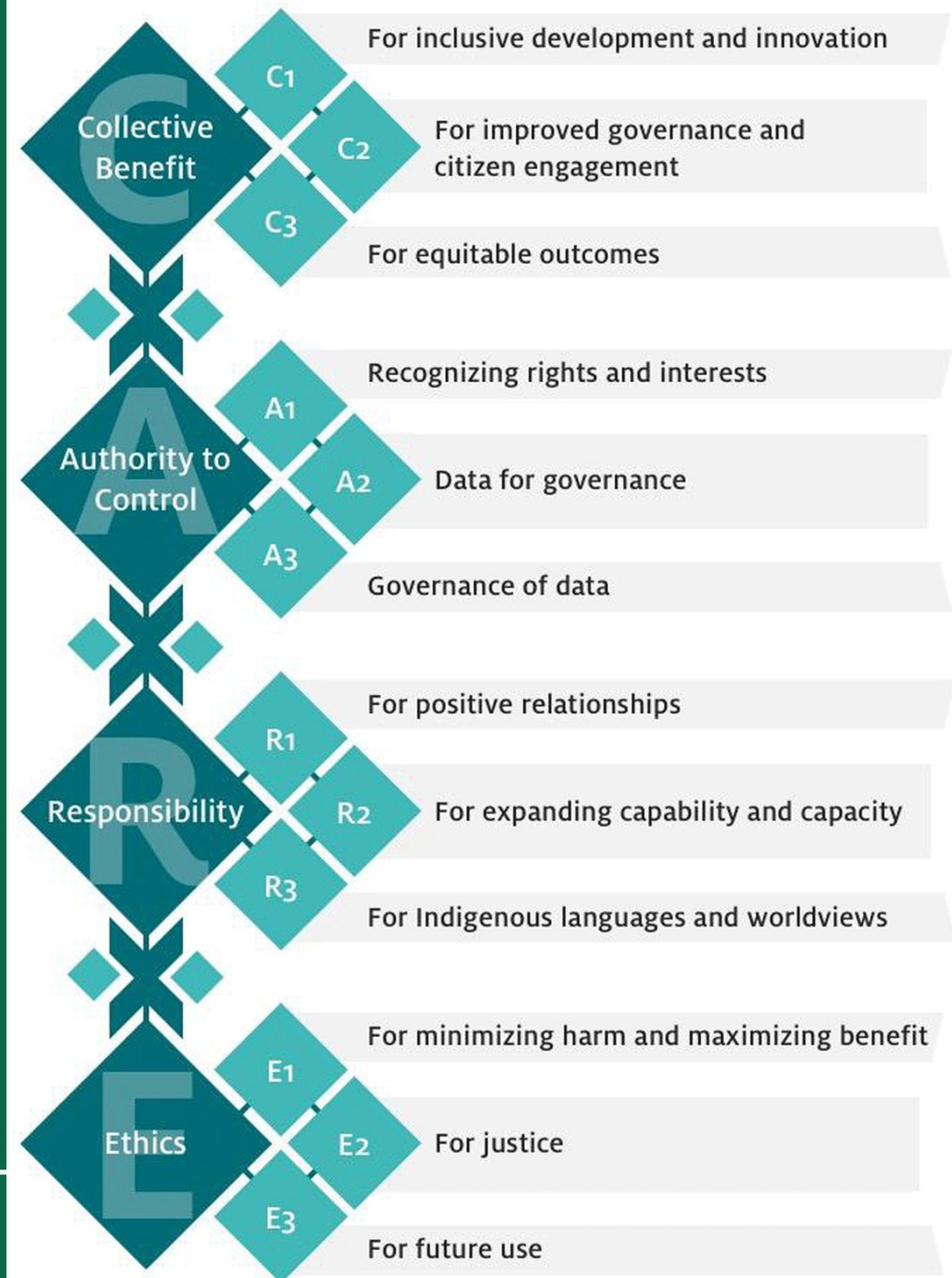
Authority
to Control

Responsibility

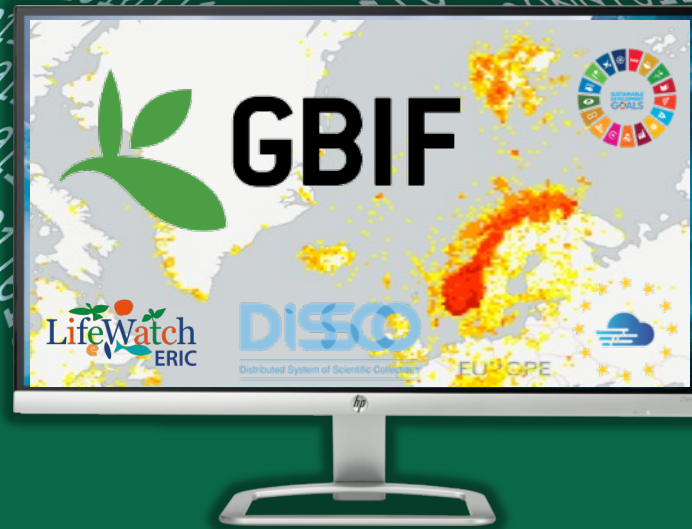
Ethics

CARE DATA PRINCIPLES

- CARE is an acronym which stands for:
 - **Collective Benefit,**
 - **Authority to Control,**
 - **Responsibility,**
 - **Ethics**
- CARE was created by the International Indigenous Data Sovereignty Interest Group, a group that is a part of the Research Data Alliance.
- Resolve **Indigenous Peoples' rights** to and interests in their data across the data lifecycle.
- Building on **FAIR** data principles while ensuring indigenous interests.



GBIF IS A FAIR & OPEN BIODIVERSITY DATA INFRASTRUCTURE



INCENTIVES FOR DATA REUSE

To incentivize the sharing of useful data, the scientific enterprise needs a well-defined **system that links individuals with reuse of data sets they generate**

Pierce *et al.* Credit data generators for data reuse, *Nature* 6 June 2019





DATA CITATION - A NEW CURRENCY OF SCIENCE

- **Peer-reviewed scholarly papers** in high impact journals still maintain considerable weight for impact metrics.
- A **movement** is under way to **build similar status for** open data, open metadata, open material samples, and other **open access scientific research products...**



DECLARATION ON RESEARCH ASSESSMENT DORA

- DORA recognizes the need to improve the ways in which the outputs of scholarly research are evaluated.
- Worldwide movement covering all scholarly disciplines and all key stakeholders including funders, publishers, professional societies, institutions (universities), and researchers.
- Developed in 2012 in San Francisco
- To date (2023-11-17), **21 157 individuals** and **3 031 organizations** in **164 countries** have signed DORA.
- The Research Council of Norway (RCN) signed DORA in May 2018 [\[link\]](#)

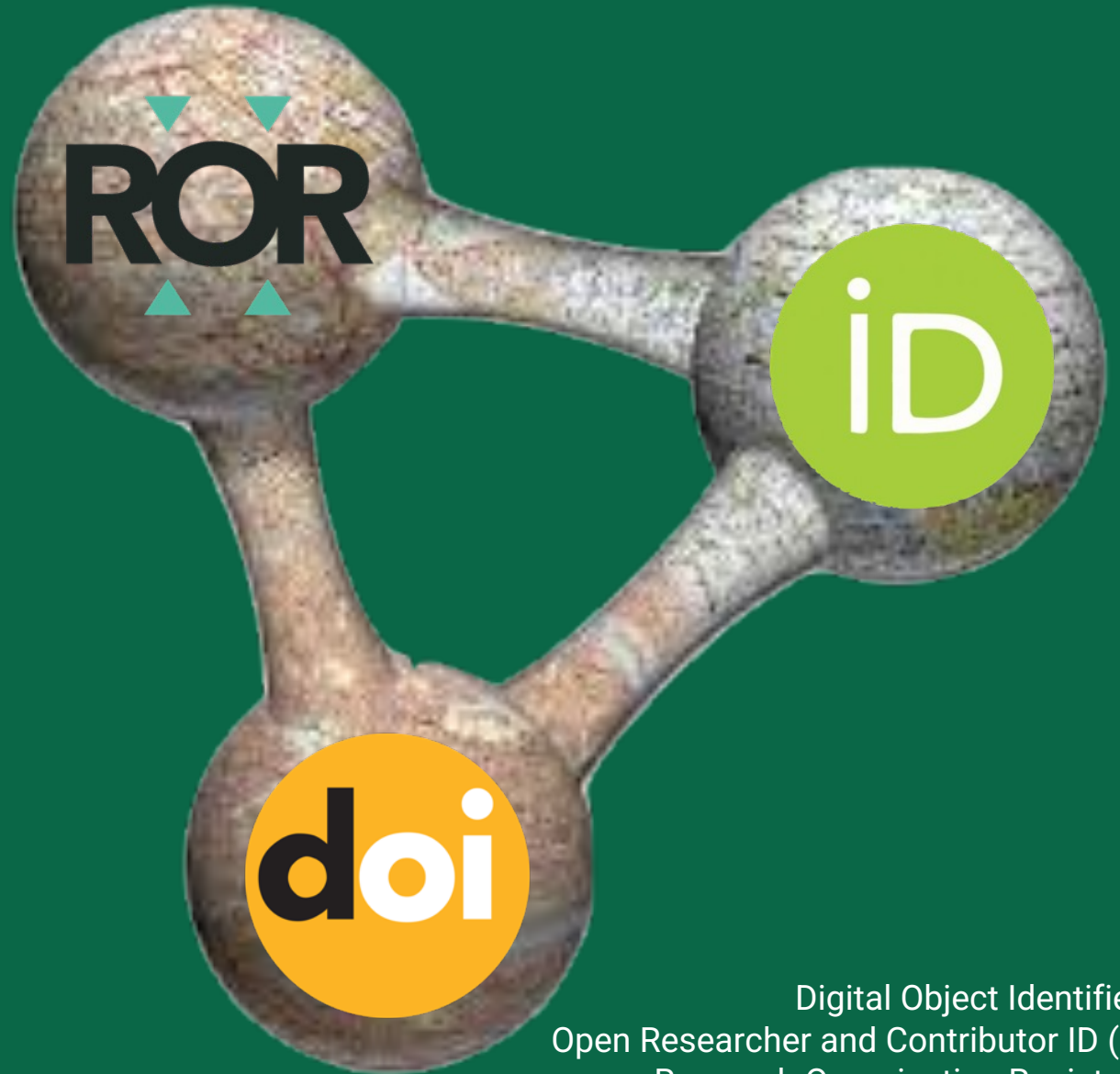
MACHINE-READABILITY REQUIRES PERSISTENT IDENTIFIERS

*The purpose of identifiers is
... to name things
... making it possible to refer to them*



ROR for institutions
ORCID for people
DOI for datasets
GRSciColl UUID for collections

*will enable the linking of museum
collection specimens to scientific
literature and scientific actors
(authors, curators, etc)*



Digital Object Identifier (DOI)
Open Researcher and Contributor ID (ORCID)
Research Organisation Registry (ROR)
Universally Unique Identifier (UUID)



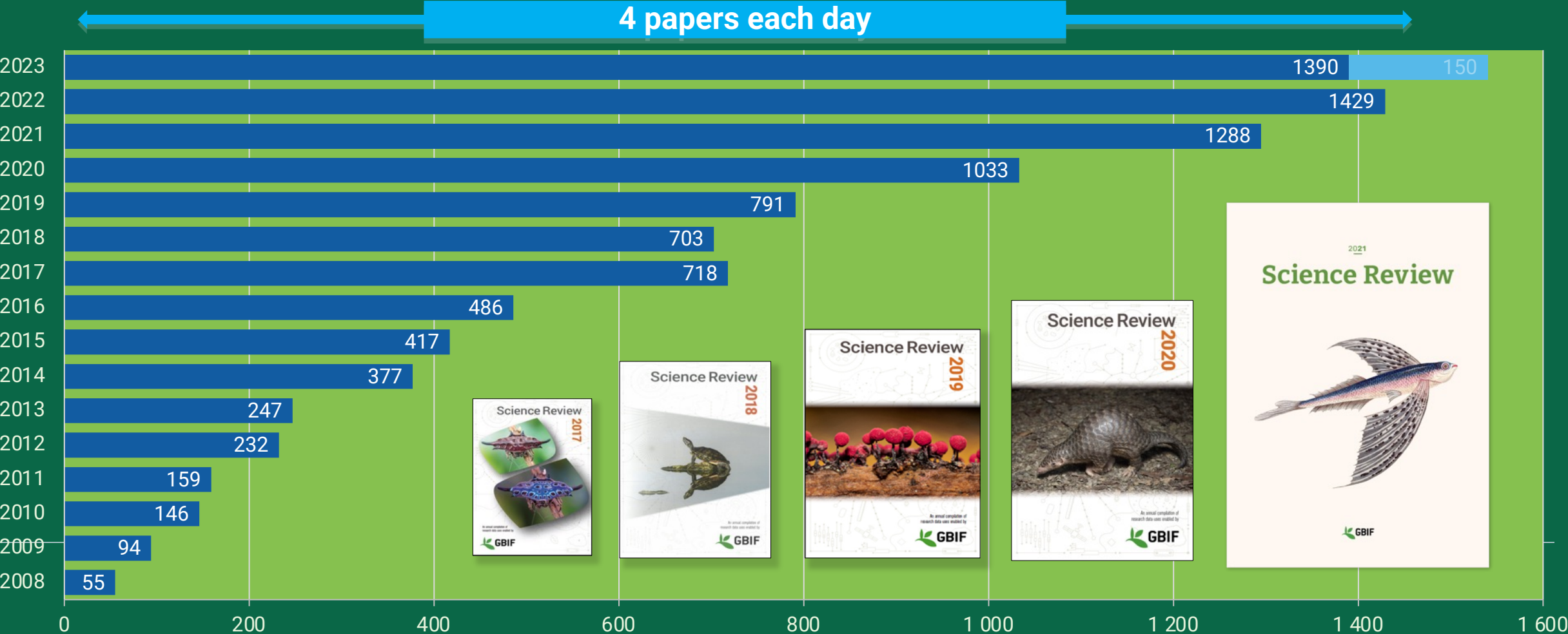
GBIF

#CiteTheDOI

GBIF started issuing DOIs on 3 February 2015



PEER-REVIEWED PUBLICATIONS USING GBIF-MEDIATED DATA

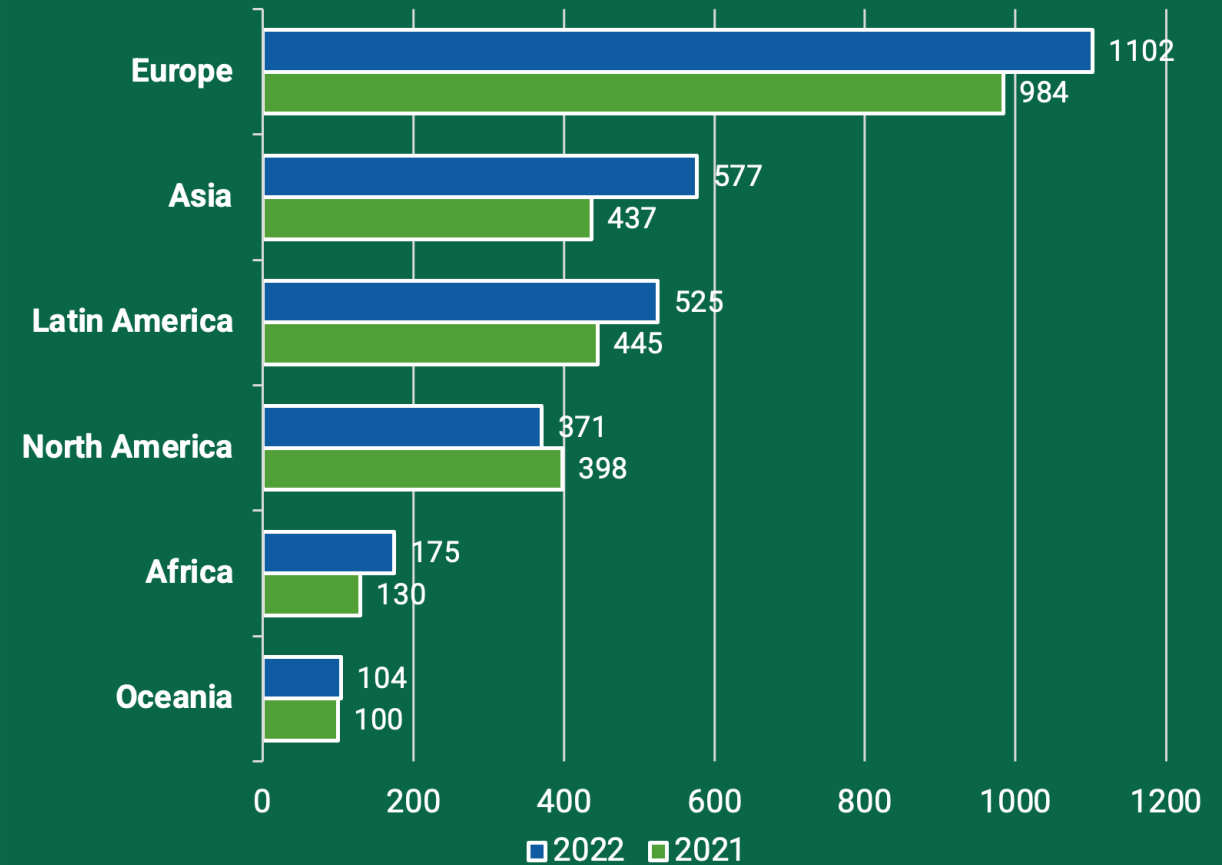


DATA USE IN PEER-REVIEWED JOURNALS

Peer-reviewed uses by country

End of Year		2023	2022	2021
1	United States	306	292	328
2	China	300	300	228
3	Brazil	145	152	147
4	United Kingdom	144	146	137
5	Germany	126	120	131
6	Mexico	105	131	134
7	Spain	95	100	103
8	France	88	75	75
9	Australia	80	78	69
10	India	61	62	35
-	Norway	30	41	37

Peer-reviewed uses by region



HOW TO CITE DATA MEDIATED BY GBIF?

1. **Download data** from GBIF.org
2. and receive recommended citation with a **download DOI**
3. **Cite the DOI** in published research or other work

Example: GBIF.org (9 November 2021) GBIF Occurrence Download <https://doi.org/10.15468/dl.xxxxxx>

DOI BASED DATA CITATION AT GBIF.ORG -- #CITETHEDO

paper

data citations

datasets

JSE Journal of Systematics and Evolution

Research Article | Free Access

Phylogenomics, biogeography, and evolution of the blue- or white-fruited dogwoods (*Cornus*)—Insights into morphological and ecological niche divergence following intercontinental geographic isolation

Kira Lindelof, Julieta A. Lindo, Wenbin Zhou, Xiang Ji, Qiu-Yun (Jenny) Xiang

First published: 27 August 2020 | <https://doi.org/10.1111/jse.12676> | Citations: 1

SECTIONS PDF TOOLS SHARE

Abstract

The eastern Asian (EA)-eastern North American (ENA) floristic disjunction represents a major pattern of phytogeography of the Northern Hemisphere. Despite 20 years of studies dedicated to identification of taxa that display this disjunct pattern, its origin and evolution remain an open question, especially regarding post-isolation evolution. The blue- or white-fruited dogwoods (BW) are the most species-rich among the four major clades of *Cornus* L., consisting of ~35 species divided into three subgenera (subg. *Yunquania*, subg. *Mesomora*, and subg. *Kraniopsis*). The BW group provides an excellent example of the EA-ENA floristic disjunction for biogeographic study due to its diversity distribution centered in eastern Asia and eastern North America, yet its species relationships and delineation have remained poorly understood. In this study, we combined genome-wide markers from RAD-seq, morphology, fossils, and climate data to understand species relationships, biogeographic history, and ecological niche and morphological evolution. Our phylogenomic analyses with RAxML and MrBayes recovered a strongly supported and well-resolved phylogeny of the BW group with three intercontinental disjunct clades in EA and ENA or Eurasia and North America, of which two are newly identified within subg. *Kraniopsis*. These analyses also recovered a

References

Adams DC, Berns CM, Kozak KH, Wiens JJ. 2009. Are rates of species diversification correlated with rates of morphological evolution? *Proceedings Biological Sciences* 276: 2729–2738. Crossref | PubMed | Web of Science | Google Scholar

GBIF.org. 2020. GBIF Occurrence Download. Available from <https://doi.org/10.15468/dl.vxxu7>. Google Scholar

GBIF.org. 2020. GBIF Occurrence Download. Available from <https://doi.org/10.15468/dl.vrvfg>. Google Scholar

GBIF.org. 2020. GBIF Occurrence Download. Available from <https://doi.org/10.15468/dl.4utwft>. Google Scholar

GBIF.org. 2020. GBIF Occurrence Download. Available from <https://doi.org/10.15468/dl.yp3my7>. Google Scholar

High silicon concentrations in grasses are linked to environmental conditions and not associated with C4 photosynthesis

Brightly, W. Hartley, S. Osborne, C. Simpson, K. Strömberg, J. Ehrlén

The uptake and deposition of silicon (Si) as silica phytoliths in grasses among late Pleistocene and Holocene grasslands. Among these, herbivore defense has received particular attention, particularly in grasses. Grasses are well known for their high silicon...

C4 photosynthesis • grass • grassland • herbivore • phytolith

Journal article | Peer-reviewed

Data referenced in study [DOI 10.15468/dl.heuwwg](https://doi.org/10.15468/dl.heuwwg)

Temperature change in subtropical southeastern Africa during the past 790,000 yr

Chevalier, M. Chevalier, L. Dupont, L. Johnson, T. (2020) Geology

Across the glacial cycles of the late Pleistocene (~700 k.y.), temperature variability at low latitudes is often considered to have been negligible compared to changes in precipitation. However, a paucity of quantified temperature reconstructions reliably assesses this...

Journal article | Open access | Peer-reviewed

Data referenced in study [DOI 10.15468/dl.3gylft](https://doi.org/10.15468/dl.3gylft) [DOI 10.15468/dl.czfuzq](https://doi.org/10.15468/dl.czfuzq) [DOI 10.15468/dl.h891rx](https://doi.org/10.15468/dl.h891rx) [DOI 10.15468/dl.kzozv](https://doi.org/10.15468/dl.kzozv) [DOI 10.15468/dl.tactf](https://doi.org/10.15468/dl.tactf) [DOI 10.15468/dl.mvskn](https://doi.org/10.15468/dl.mvskn) [DOI 10.15468/dl.pwbfz](https://doi.org/10.15468/dl.pwbfz) [DOI 10.15468/dl.rldwz](https://doi.org/10.15468/dl.rldwz) [DOI 10.15468/dl.wamw](https://doi.org/10.15468/dl.wamw)

Landscape Analysis for the Specimen Data Refinement

Walton, S. Livermore, L. Bärki, O. Cubey, R. Drinkwater, R. Englund, M. ... (2020) Ideas and Outcomes

This report reviews the current state-of-the-art applied approaches on automated toolboxes and workflows for extracting information from images of natural history specimens and their labels. We consider the possibilities of repurposing existing tools, including workflow management systems, and ar...

collections digitisation • data reconciliation • data refinery • digitisation • linked open data • machine learning

Journal article | Open access | Peer-reviewed

Data referenced in study [DOI 10.15468/dl.8pq57z](https://doi.org/10.15468/dl.8pq57z)

Phylogenomics, biogeography, and evolution of the blue- or white-fruited dogwoods (*Cornus*) - insights into morphological and ecological niche divergen...

Lindelof, Kira, J. Zhou, W. Ji, X. Xiang, Q. (2020) Journal of Systematics and Evolution

The eastern Asian (EA)-eastern North American (ENA) floristic disjunction represents a major pattern of phytogeography of the Northern Hemisphere. Despite 20 years of studies dedicated to identification of taxa that display this disjunct pattern, its origin and evolution remain an open question, esp...

Cornus • RAD-seq • biogeography • eastern Asian-eastern North American disjunction • ecological niche and morphospace • phylogenomics

Journal article | Peer-reviewed

Data referenced in study [DOI 10.15468/dl.4utwft](https://doi.org/10.15468/dl.4utwft) [DOI 10.15468/dl.5u9yp](https://doi.org/10.15468/dl.5u9yp) [DOI 10.15468/dl.63wyl](https://doi.org/10.15468/dl.63wyl) [DOI 10.15468/dl.6pwk8h](https://doi.org/10.15468/dl.6pwk8h) [DOI 10.15468/dl.bdbvs](https://doi.org/10.15468/dl.bdbvs) [DOI 10.15468/dl.cpw4es](https://doi.org/10.15468/dl.cpw4es) [DOI 10.15468/dl.dzppfk](https://doi.org/10.15468/dl.dzppfk) [DOI 10.15468/dl.gmgers](https://doi.org/10.15468/dl.gmgers) [DOI 10.15468/dl.liziz](https://doi.org/10.15468/dl.liziz) [DOI 10.15468/dl.luxfmb](https://doi.org/10.15468/dl.luxfmb) [DOI 10.15468/dl.jfjbnp](https://doi.org/10.15468/dl.jfjbnp) [DOI 10.15468/dl.kx3cr](https://doi.org/10.15468/dl.kx3cr) [DOI 10.15468/dl.nrvvg](https://doi.org/10.15468/dl.nrvvg) [DOI 10.15468/dl.ozy98m](https://doi.org/10.15468/dl.ozy98m) [DOI 10.15468/dl.ragih](https://doi.org/10.15468/dl.ragih) [DOI 10.15468/dl.usd8d](https://doi.org/10.15468/dl.usd8d) [DOI 10.15468/dl.vxgtp](https://doi.org/10.15468/dl.vxgtp) [DOI 10.15468/dl.vxxu7g](https://doi.org/10.15468/dl.vxxu7g) [DOI 10.15468/dl.xvexc5](https://doi.org/10.15468/dl.xvexc5) [DOI 10.15468/dl.yp3my7](https://doi.org/10.15468/dl.yp3my7)

Expansion dynamics and marginal climates drive adaptation across geographic ranges

Bontrager, M. Usui, T. Lee-Yaw, J. Anstett, D. Branch, H. Hargreaves, A. ... (2020) bioRxiv

Every species experiences limits to its geographic distribution. Some evolutionary models predict that populations at range edges are less well-adapted to their local environments due to drift, expansion load, or swamping gene flow from the range interior. Alternatively, populations near range edges...

Local adaptation • expansion load • geographic range limit • peripheral population • quantitative synthesis • transplant experiment

Working paper | Open access

Data referenced in study [DOI 10.15468/dl.0kmuse](https://doi.org/10.15468/dl.0kmuse) [DOI 10.15468/dl.2ocj8](https://doi.org/10.15468/dl.2ocj8) [DOI 10.15468/dl.2u0fec](https://doi.org/10.15468/dl.2u0fec) [DOI 10.15468/dl.2uzb68](https://doi.org/10.15468/dl.2uzb68) [DOI 10.15468/dl.37k2g](https://doi.org/10.15468/dl.37k2g) [DOI 10.15468/dl.3trzu4](https://doi.org/10.15468/dl.3trzu4) [DOI 10.15468/dl.3wtnt1](https://doi.org/10.15468/dl.3wtnt1) [DOI 10.15468/dl.4kk9ys](https://doi.org/10.15468/dl.4kk9ys) [DOI 10.15468/dl.4oubly](https://doi.org/10.15468/dl.4oubly) [DOI 10.15468/dl.4vryyy](https://doi.org/10.15468/dl.4vryyy) [DOI 10.15468/dl.6sqzqa](https://doi.org/10.15468/dl.6sqzqa) [DOI 10.15468/dl.7dgr71](https://doi.org/10.15468/dl.7dgr71) [DOI 10.15468/dl.8biaqp](https://doi.org/10.15468/dl.8biaqp) [DOI 10.15468/dl.8fwdg7](https://doi.org/10.15468/dl.8fwdg7) [DOI 10.15468/dl.99dzbz](https://doi.org/10.15468/dl.99dzbz) [DOI 10.15468/dl.9me17d](https://doi.org/10.15468/dl.9me17d) [DOI 10.15468/dl.9pnqxd](https://doi.org/10.15468/dl.9pnqxd) [DOI 10.15468/dl.aagt28](https://doi.org/10.15468/dl.aagt28) [DOI 10.15468/dl.ansoql](https://doi.org/10.15468/dl.ansoql) [DOI 10.15468/dl.aq647g](https://doi.org/10.15468/dl.aq647g) [DOI 10.15468/dl.aq7d7f](https://doi.org/10.15468/dl.aq7d7f) [DOI 10.15468/dl.bfxn6z](https://doi.org/10.15468/dl.bfxn6z) [DOI 10.15468/dl.bguatz](https://doi.org/10.15468/dl.bguatz) [DOI 10.15468/dl.bu22xg](https://doi.org/10.15468/dl.bu22xg) [DOI 10.15468/dl.buigxr](https://doi.org/10.15468/dl.buigxr) [DOI 10.15468/dl.bxif1i](https://doi.org/10.15468/dl.bxif1i) [DOI 10.15468/dl.cbv7d](https://doi.org/10.15468/dl.cbv7d) [DOI 10.15468/dl.ce19ah](https://doi.org/10.15468/dl.ce19ah) [DOI 10.15468/dl.cqpcum](https://doi.org/10.15468/dl.cqpcum) [DOI 10.15468/dl.dh5af4](https://doi.org/10.15468/dl.dh5af4) [DOI 10.15468/dl.drv9ab](https://doi.org/10.15468/dl.drv9ab) [DOI 10.15468/dl.dh44zv](https://doi.org/10.15468/dl.dh44zv) [DOI 10.15468/dl.e2z9gr](https://doi.org/10.15468/dl.e2z9gr) [DOI 10.15468/dl.e6na7e](https://doi.org/10.15468/dl.e6na7e) [DOI 10.15468/dl.eqa3r](https://doi.org/10.15468/dl.eqa3r)

Source dataset #1

Source dataset #2

Source dataset #3

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doi



Dataset DOIs

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Source dataset #2			doi
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Source dataset #3			doi
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Source dataset #3 **doi**

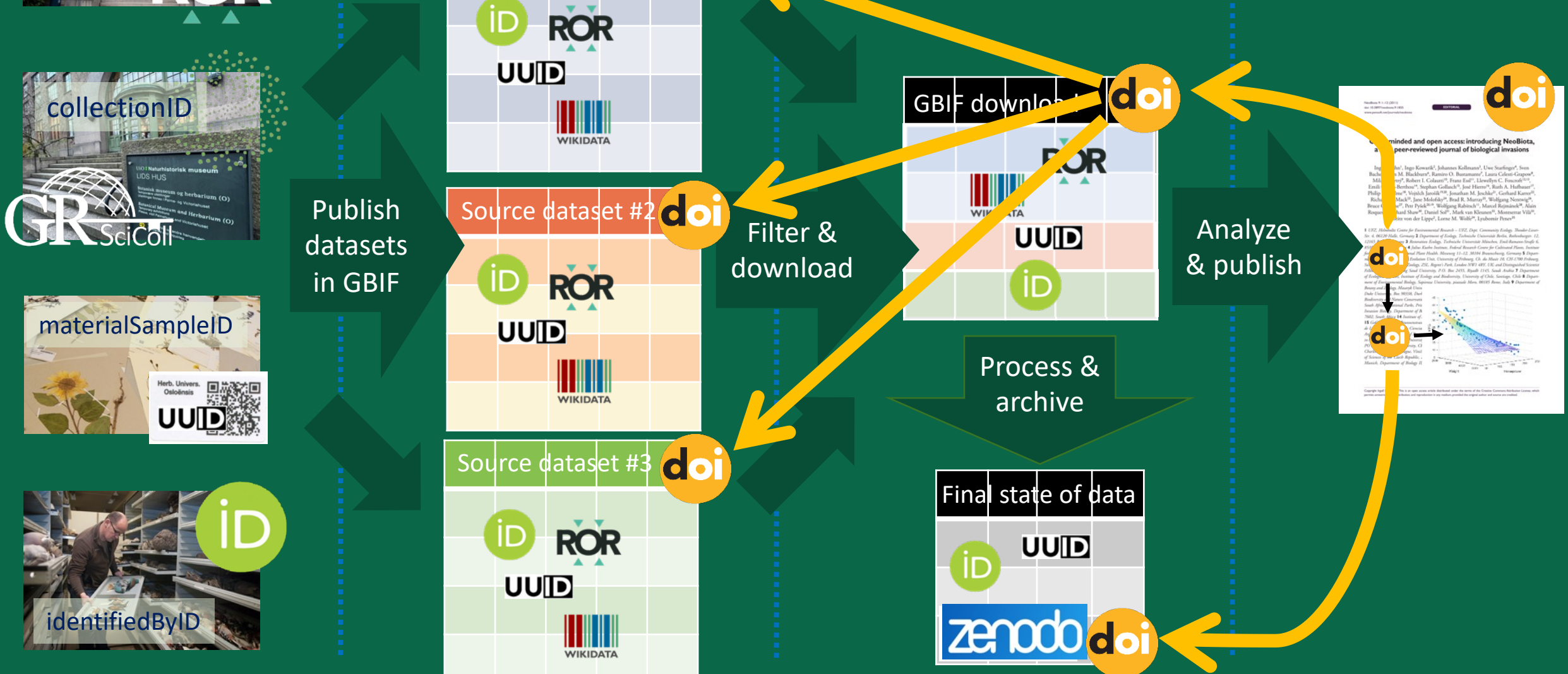
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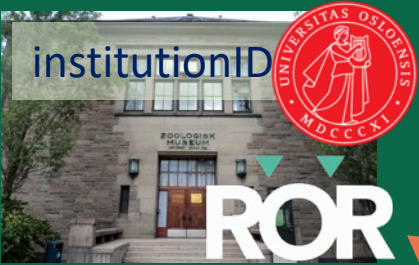
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Dataset DOIs

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Download DOI

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Bibliographic DOI



Publish datasets in GBIF

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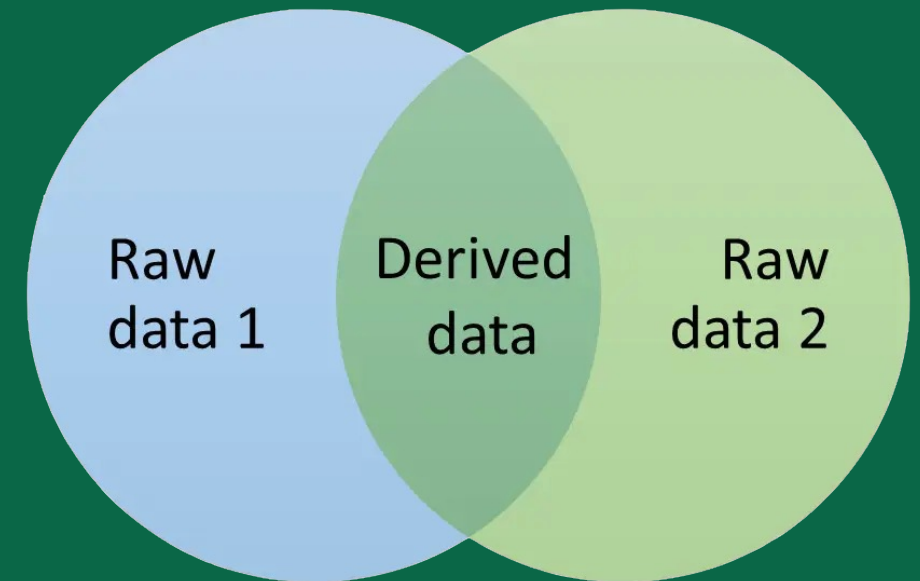
Derived Dataset

Create your own citable dataset DOI

The logo for Digital Object Identifier (DOI), featuring the lowercase letters 'doi' in a bold, sans-serif font. The 'd' is black, while the 'oi' is white. This text is centered within a bright orange circle, which is itself set against a light green, five-pointed star shape.

DERIVED DATASET

- a GBIF.org download that has been **filtered/reduced significantly**, or
- data accessed through a cloud service, e.g. Microsoft AI for Earth (Azure), or
- **data obtained by any means for which no DOI was assigned**, but one is required (e.g. third-party tools accessing the GBIF search API)
 - ... *including rgbif*



HOW TO CREATE A DERIVED DATASET

When created, a derived dataset is assigned a unique DOI that can be used to cite the data.

To create a derived dataset, you will need to authenticate using a GBIF.org account and provide:

- a **title** of the dataset,
- a **list of the GBIF datasets** (by DOI or datasetKey) from which the data originated, ideally with **counts** of how many records each dataset contributed,
- a **persistent URL** of where the extracted dataset can be accessed,
 - [e.g. Zenodoo, Dataverse, Dryad, ...]
- a **description** of how the dataset was prepared,
- **(optional)** the GBIF download DOI, if the dataset is derived from an existing download , and
- **(optional)** a date for when the derived dataset should be registered if not immediately .



Global Registry of Scientific Collections

*GRSciColl was established at Smithsonian in 2013
Hosting of GRSciColl was transferred to GBIF in 2019*

GRSCICOLL

- The Global Registry of Scientific Collections (GRSciColl) was a community-curated clearing house of collections information developed by the Consortium of the Barcode of Life (CBOL) – launched in 2013.
- Hosting the GRSciColl was transferred to GBIF in 2018 and the upgraded portal came back online in 2019.

<https://www.gbif.org/grscicoll/institution/search?q=Norway>

The screenshot shows the GBIF Registry of Scientific Collections website. The top navigation bar includes links for 'Get data', 'How-to', 'Tools', 'Community', and 'About', along with utility icons and a user profile 'dag.endresen'. The main heading is 'GBIF Registry of Scientific Collections'. Below this is a secondary navigation bar with 'ABOUT', 'INSTITUTIONS' (highlighted), 'COLLECTIONS', and 'STAFF MEMBERS'. The 'Institutions' section contains a definition: 'Institution refers to any institution or organization that owns and manages scientific collections. This includes herbaria, museums, zoos, botanical gardens, biobanks, among others. An institution may contain multiple collections, in which case those should be entered individually under Institutional/Project Collections and linked back to the parent institution.' A search bar with 'Norway' entered and a magnifying glass icon is present. Below the search bar, it says '10 RESULTS' and 'SUGGEST A NEW INSTITUTION'. A table lists the search results with columns for Code, Name, City/Town, State/Province, Country, and Status.

Code	Name	City/Town	State/Province	Country	Status
UiT	UiT The Arctic University of Norway	Tromsø		Norway	Active
NMBU	Norwegian University of Life Sciences (NMBU)	Ås		Norway	Active
NLH	Agricultural University of Norway	N-1432 Aas-NLH		Norway	Active
MUST	Museum Stavanger	Stavanger		Norway	Active
NINA	Norwegian Institute for Nature Research	Trondheim		Norway	Active
NIBIO	Norwegian Institute of Bioeconomy Research	Ås		Norway	Active
UiO	University of Oslo	Oslo		Norway	Active
MTMU "Balsfjord"	Balsfjord Fjord Museum and Wetland Centre, Midt-Troms Museum	Storsteinnes		Norway	Inactive
IMR	Norwegian Institute of Marine Research	Bergen		Norway	Inactive
NTNU-VM	NTNU Museum of Natural History and Archaeology	Trondheim		Norway	Active

GRSCICOLL

- 8 117 collection-holding institutions
- 7 010 scientific collections
- 17 000 collection staff members
- <https://www.gbif.org/grscicoll>

<https://www.gbif.org/grscicoll/collection/search?q=norway>

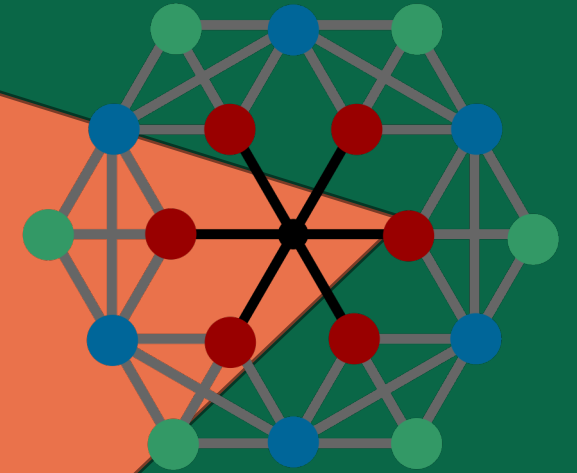
The screenshot shows the GBIF Registry of Scientific Collections website. The top navigation bar includes links for 'Get data', 'How-to', 'Tools', 'Community', and 'About'. The main header is 'GBIF Registry of Scientific Collections'. Below the header, there are navigation tabs for 'ABOUT', 'INSTITUTIONS', 'COLLECTIONS', and 'STAFF MEMBERS'. The 'COLLECTIONS' tab is selected. The main content area is titled 'Collections' and contains three paragraphs explaining different collection types: Institutional, Project, and Personal. Below this, there is a search bar with 'Norway' entered. The search results show 14 results, with a 'SUGGEST A NEW COLLECTION' button. The results are displayed in a table with columns for Code, Name, Accession status, and Status.

Code	Name	Accession status	Status
MA	Mammal collection NTNU University Museum	Institutional	Active
BG-L	Lichen herbarium	Institutional	Active
O-L	Lichen herbarium	Institutional	Active
O-V	Vascular Plant Herbarium		Active
O-F	Mycology Herbarium		Active
O-A	Grethe Hasle Diatoms		Active
DP	DNA Bank Vascular plants		Active
DFL	DNA Bank Fungi and Lichens		Active
O-B	Bryophyte Herbarium		Active
O-A	Algae		Active
DMA	Mammals		Active
ENT	Entomology		Inactive
DOT	DNA Bank Other groups		Inactive
DFH	DNA Bank Fish and Herptiles		Inactive

INSTITUTION IDENTIFIERS FOR SOME OF THE MUSEUMS IN NORWAY

Museums	ROR ID	Wikidata	GRSciColl	GBIF publisher institution
Universitetet i Agder (UiA) Agder naturmuseum og botaniske hage	03x297z98 --	Q3375341 Q3375341	UiA KMN	826d1920-7f5c-4091-a84e-668aa2e35b61 --
Universitetet i Bergen University Museum of Bergen Institutt for naturhistorie	03zga2b32 -- --	Q204457 Q301787 Q11990981	UiB -- --	3f3967bf-ecc7-4455-ba89-4e0ab6d6fd3c -- --
Helgeland Museum Rana Museum	02gyhy076 --	Q11057676 Q11997066	Helgeland --	a030b53d-7ab0-41dc-8ca7-77f65d5c8157 --
Midt-Troms Museum Balsfjord Fjordmuseum og Våtmarkssenter	-- --	Q12327078 Q105533121	-- MTMU Bjalsfjord	-- 9e8e7946-cd17-4c58-81c1-dc8bef359360
Museum Stavanger (MUST)	03bq5ar94	Q19382034	MUST	ecc5cd9e-2d25-4b8d-89c8-a0711eee813b
Universitetet i Oslo (UiO) Naturhistorisk museum i Oslo (NHMO) Botanisk museum (Oslo herbarium - O)	01xtthb56 -- --	Q486156 Q1840963 Q2036576	UiO NHMO O	f314b0b0-e3dc-11d9-8d81-b8a03c50a862 -- --
Randsfjordmuseene AS	--	Q11997108	--	--
Universitetet i Tromsø (UiT) Tromsø Museum, Universitetsmuseet	00wge5k78 --	Q279724 Q1686510	UiT TROM	689b40c4-ff31-4cd0-83a5-a7a828f1cd92 --
Varanger Museum	--	Q12009007	--	--
Norges Teknisk Naturvitenskapelige Universitet (NTNU) Vitenskapsmuseet	05xg72x27 --	Q314536 Q1770886	TRH NTNU-VM	a8144f37-5ff7-4137-9400-94b5b2ea4ec4 --

new tools

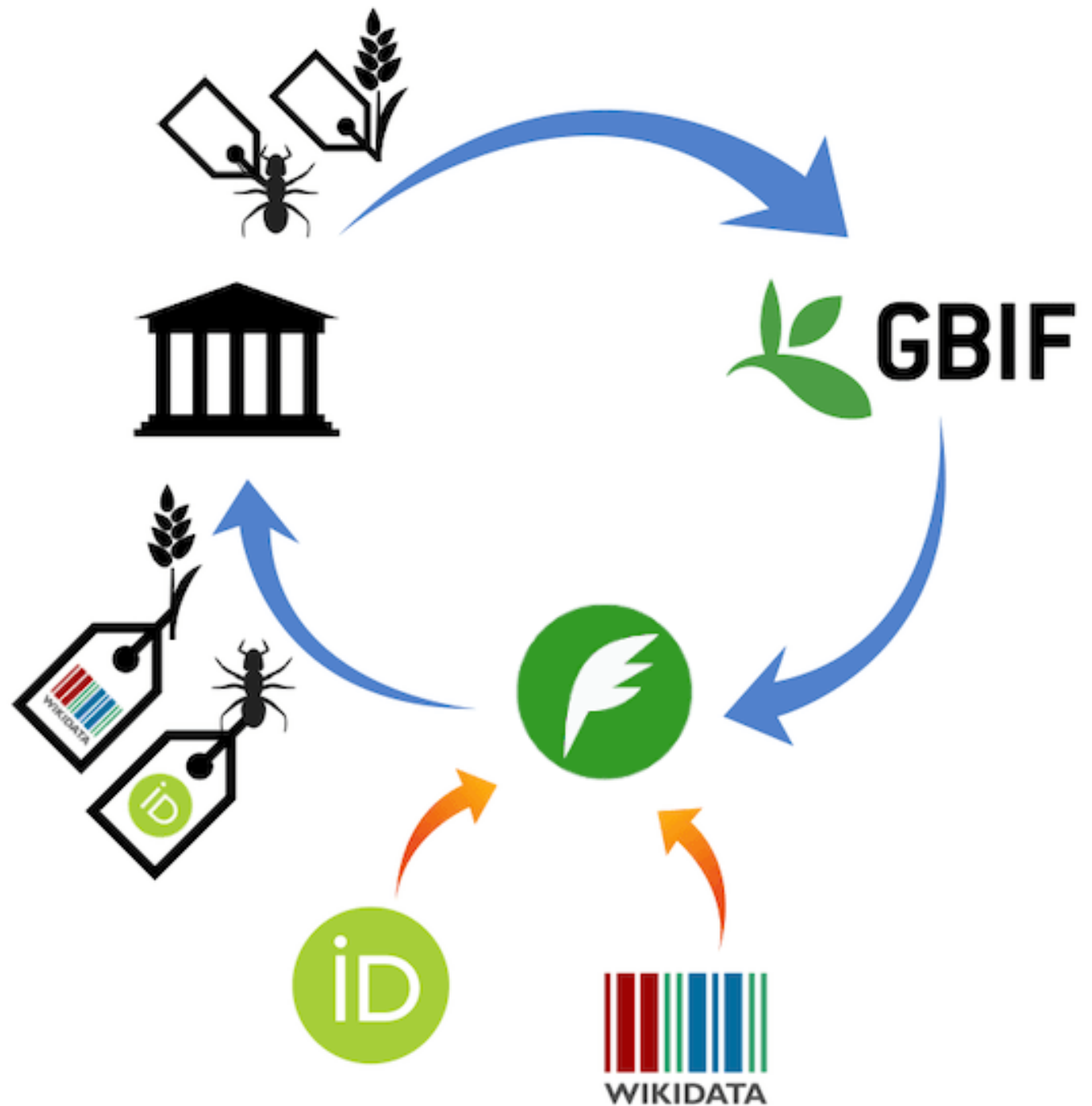


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Occurrences 3

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Identified by ID ^

<https://www.wikidata.org/wiki/Q94522>

Search

CLEAR

Record number v

Occurrence id v

Organism id v

Publishing country or area v

Elevation v

Depth v

Locality v

Water body v

State province v

Repatriated v

Is in cluster v

DWCA extension v

SEARCH OCCURRENCES | 24,923 RESULTS

TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
Sphaerophorus fragilis (L.) Pers.	Norway	60.6N, 6.7E	1975 August	Preserved specimen	Lichen herbarium, Oslo (O) UiO
<i>Atriplex</i> 1758	Spain		1971 January		
<i>Schismus barbatus</i> (L.) Thell.	Spain		1971 January		
<i>Amaranthus</i> L.	Spain		1971 January		
<i>Setaria</i> Beauv.	Spain	28.3N, 16.5W	1971 January		
<i>Amaranthus</i> L.	Spain		1971 January		
<i>Spergularia</i> (Pers.) J. & K.Presl	Spain		1971 January		
<i>Salix phylicifolia</i>			1971 August		
<i>Beta patula</i>			1971 January		
<i>Bromus rigidus</i>			1971 January		
<i>Asparagus pastinacifolius</i>			1971 January		
<i>Cheilanthes maculata</i>			1971 January		
<i>Spergula fallax</i>			1971 January		
<i>Schismus barbatus</i>			1971 January		
<i>Asphodelus fistulosus</i>			1971 January		
Polypodium serratum Miace	Spain	28.2N, 15.6W	1970 January		
<i>Sporobolus indicus</i> R.Br.	Spain	28.1N, 15.5W	1970 January		
<i>Trisetaria pumila</i> (Desf.) Maire	Spain	28.1N, 15.5W	1970 January		
<i>Schismus barbatus</i> (L.) Thell.	Spain		1970 January	Preserved specimen	Vascular Plant Herbarium, Oslo (O) UiO

Sphaerophorus fragilis (L.) Pers.

Occurrence ID [urn:catalog:O:V:2007334](#)

Catalogue number 2007334

Material Sample ID [urn:uid:0574816d-3d99-41b8-b3b8-c6035de0e929](#)

Other catalogue numbers

Event date 1971-01-04

Recorded by Johannes Lid

Recorded by ID <http://www.wikidata.org/entity/Q94522>

Date identified 1971-01-04T00:00:00

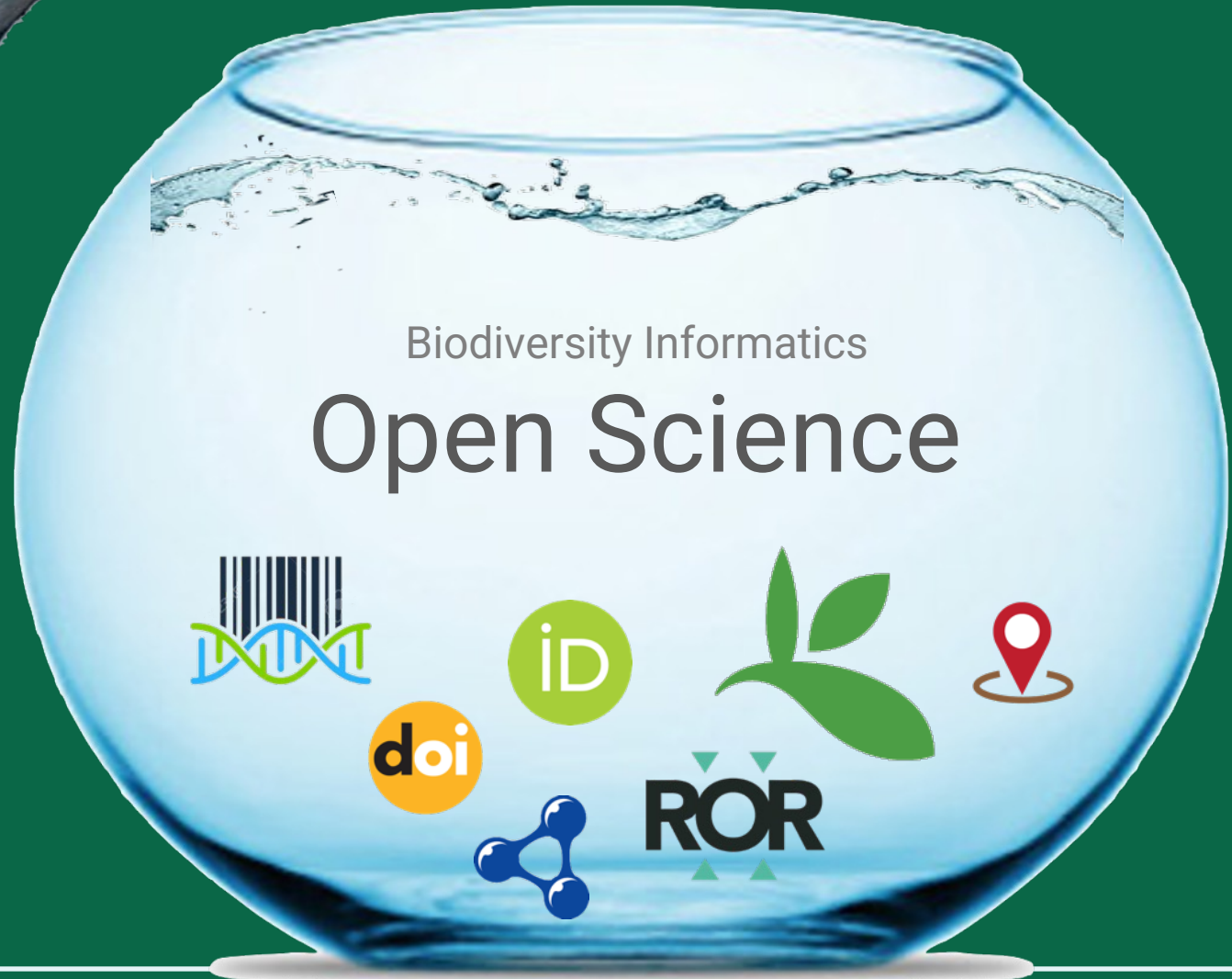
Identified by Johannes Lid

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