A Review of Biotic Interactions and Taxon Names Found in globalbioticinteractions/fmnh hash://md5/e0d0c1436b55ec3ce1f661a9965bcc4f

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https://github.com/globalbioticinteractions/fmnh/issues

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Abstract

Life on Earth is sustained by complex interactions between organisms and their environment. These biotic interactions can be captured in datasets and published digitally. We present a review and archiving process for such an openly accessible digital interactions dataset of known origin and discuss its outcome. The dataset under review, named globalbioticinteractions/fmnh, has fingerprint hash://md5/e0d0c1436b55ec3ce1f661a9965bcc4f, is 1.12GiB in size and contains 128,976 interaction with 8 unique types of associations (e.g., adjacentTo) between 22,370 primary taxon (e.g., Trichobius joblingi Wenzel, 1966) and 33,924 associated taxon (e.g., Carollia perspicillata). This report includes detailed summaries of interaction data, a taxonomic review from multiple catalogs, and an archived version of the dataset from which the reviews are derived.

Contents

Introduction

Data Review and Archive

Data review and archiving can be a time-consuming process, especially when done manually. This review report aims to help facilitate both activities. It automates the archiving of datasets, including Darwin Core archives, and is a citable backup of a version of the dataset. Additionally, an automatic review of species interaction claims made in the dataset is generated and registered with Global Biotic Interactions (J. H. Poelen, Simons, and Mungall 2014).

This review includes summary statistics about, and observations about, the dataset under review:

> Field Museum of Natural History (Botany) Bryophyte Collection - Version 11.9 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_bryophyte 2025-04-05T00:04:10.674Z Field Museum of Natural History (Botany) Fungi Collection - Version 4.14 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_fungi 2025-04-05T00:04:10.674Z Field Museum of Natural History (Botany) Lichen Collection - Version 2.15 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_lichens 2025-04-05T00:04:10.674Z Field Museum of Natural History (Botany) Pteridophyte Collection - Version 2.9 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_pteridophytes 2025-04-05T00:04:10.674Z Field Museum of Natural History (Botany) Seed Plant Collection - Version 11.16 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_seedplants 2025-04-05T00:04:10.674Z Field Museum of Natural History (Zoology) Bird Collection - Version 14.22 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fm_birds 2025-04-05T00:04:10.674Z Field Museum of Natural History (Zoology) Insect, Arachnid and Myriapod Collection - Version 12.64 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_insects 2025-04-05T00:04:10.674Z Field Museum of Natural History (Zoology) Invertebrate Collection - Version 18.47 https://fmipt.fieldmuseum.org/ipt/archive.do?r=fmnh_invertebrates 2025-04-05T00:04:10.674Z hash://md5/e0d0c1436b55ec3ce1f661a9965bcc4f

For additional metadata related to this dataset, please visit https://github.com

/globalbioticinteractions/fmnh and inspect associated metadata files including, but not limited to, *README.md*, *eml.xml*, and/or *globi.json*.

Methods

The review is performed through programmatic scripts that leverage tools like Preston (Elliott et al. 2025), Elton (Kuhn, Poelen, and Leinweber 2025), Nomer (Salim and Poelen 2025), globinizer (J. Poelen, Seltmann, and Mietchen 2024) combined with third-party tools like grep, mlr, tail and head.

Table 1: Tools used in this review process

tool name	version
preston	0.10.1
elton	0.15.9
nomer	0.5.13
globinizer	0.4.0
mlr	6.0.0
jq	1.6
yq	4.25.3
pandoc	3.1.6.1

The review process can be described in the form of the script below [1].

```
# get versioned copy of the dataset (size approx. 1.12GiB) under review
elton pull globalbioticinteractions/fmnh

# generate review notes
elton review globalbioticinteractions/fmnh\
 > review.tsv

# export indexed interaction records
elton interactions globalbioticinteractions/fmnh\
 > interactions.tsv

# export names and align them with the Catalogue of Life using Nomer
elton names globalbioticinteractions/fmnh\
 | nomer append col\
 > name-alignment.tsv
```

or visually, in a process diagram.

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[1] Note that you have to first get the data (e.g., via elton pull globalbioticinteractions/fmnh) before being able to generate reviews (e.g., elton review globalbioticinteractions/fmnh), extract interaction claims (e.g., elton interactions globalbioticinteractions/fmnh), or list taxonomic names (e.g., elton names globalbioticinteractions/fmnh)
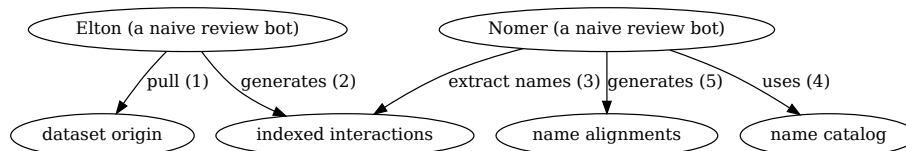
Figure 1: Review Process Overview

You can find a copy of the full review script at check-data.sh. See also GitHub and Codeberg.

Results

In the following sections, the results of the review are summarized [2]. Then, links to the detailed review reports are provided.

Files

The following files are produced in this review:

filename	description
biblio.bib	list of bibliographic reference of this review
check-dataset.sh	data review workflow/process as expressed in a bash script
data.zip	a versioned Preston (Elliott et al. 2025) archive of the data under review
HEAD	the digital signature of the data under review
index.docx	review in MS Word format
index.html	review in HTML format
index.md	review in Pandoc markdown format
index.pdf	review in PDF format
indexed-citations.csv.gz	list of distinct reference citations for reviewed species interaction claims in gzipped comma-separated values file format
indexed-citations.html.gz	list of distinct reference citations for reviewed species interactions claims in gzipped html file format

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[2]Disclaimer: The results in this review should be considered friendly, yet naive, notes from an unsophisticated robot. Please keep that in mind when considering the review results.

filename	description
indexed-citations.tsv.gz	list of distinct reference citations for reviewed species interaction claims in gzipped tab-separated values format
indexed-interactions-col-family-col-family.svg	network diagram showing the taxon family to taxon family interaction claims in the dataset under review as interpreted by the Catalogue of Life via Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024)
indexed-interactions-col-kingdom-col-kingdom.svg	network diagram showing the taxon kingdom to taxon kingom interaction claims in the dataset under review as interpreted by the Catalogue of Life via Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024)
indexed-interactions.csv.gz	species interaction claims indexed from the dataset under review in gzipped comma-separated values format
indexed-interactions.html.gz	species interaction claims indexed from the dataset under review in gzipped html format
indexed-interactions.tsv.gz	species interaction claims indexed from the dataset under review in gzipped tab-separated values format
indexed-interactions-sample.csv	list of species interaction claims indexed from the dataset under review in gzipped comma-separated values format
indexed-interactions-sample.html	first 500 species interaction claims indexed from the dataset under review in html format
indexed-interactions-sample.tsv	first 500 species interaction claims indexed from the dataset under review in tab-separated values format
indexed-names.csv.gz	taxonomic names indexed from the dataset under review in gzipped comma-separated values format
indexed-names.html.gz	taxonomic names found in the dataset under review in gzipped html format
indexed-names.tsv.gz	taxonomic names found in the dataset under review in gzipped tab-separated values format

filename	description
indexed-names-resolved-col.csv.gz	taxonomic names found in the dataset under review aligned with the Catalogue of Life as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-col.html.gz	taxonomic names found in the dataset under review aligned with the Catalogue of Life as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-col.tsv.gz	taxonomic names found in the dataset under review aligned with the Catalogue of Life as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-resolved-discoverlife.csv.gz	taxonomic names found in the dataset under review aligned with Discover Life bee species checklist as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-discoverlife.html.gz	taxonomic names found in the dataset under review aligned with Discover Life bee species checklist as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-discoverlife.tsv.gz	taxonomic names found in the dataset under review aligned with Discover Life bee species checklist as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format

filename	description
indexed-names-resolved-gbif.csv.gz	taxonomic names found in the dataset under review aligned with GBIF Backbone Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-gbif.html.gz	taxonomic names found in the dataset under review aligned with GBIF Backbone Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-gbif.tsv.gz	taxonomic names found in the dataset under review aligned with GBIF Backbone Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-resolved-itis.csv.gz	taxonomic names found in the dataset under review aligned with Integrated Taxonomic Information System (ITIS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-itis.html.gz	taxonomic names found in the dataset under review aligned with Integrated Taxonomic Information System (ITIS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-itis.tsv.gz	taxonomic names found in the dataset under review aligned with Integrated Taxonomic Information System (ITIS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format

filename	description
indexed-names-resolved-mdd.csv.gz	taxonomic names found in the dataset under review aligned with the Mammal Diversity Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-mdd.html.gz	taxonomic names found in the dataset under review aligned with Mammal Diversity Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-mdd.tsv.gz	taxonomic names found in the dataset under review aligned with Mammal Diversity Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-resolved-ncbi.csv.gz	taxonomic names found in the dataset under review aligned with the NCBI Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-ncbi.html.gz	taxonomic names found in the dataset under review aligned with the NCBI Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-ncbi.tsv.gz	taxonomic names found in the dataset under review aligned with the NCBI Taxonomy as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format

filename	description
indexed-names-resolved-pbdb.csv.gz	taxonomic names found in the dataset under review aligned with the Paleobiology Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-pbdb.html.gz	taxonomic names found in the dataset under review aligned with Paleobiology Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-pbdb.tsv.gz	taxonomic names found in the dataset under review aligned with Paleobiology Database as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-resolved-tpt.csv.gz	taxonomic names found in the dataset under review aligned with the Terrestrial Parasite Tracker (TPT) Taxonomic Resource as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-tpt.html.gz	taxonomic names found in the dataset under review aligned with the Terrestrial Parasite Tracker (TPT) Taxonomic Resource as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-tpt.tsv.gz	taxonomic names found in the dataset under review aligned with the Terrestrial Parasite Tracker (TPT) Taxonomic Resource as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format

filename	description
indexed-names-resolved-wfo.csv.gz	taxonomic names found in the dataset under review aligned with the World of Flora Online as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-wfo.html.gz	taxonomic names found in the dataset under review aligned with the World of Flora Online as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-wfo.tsv.gz	taxonomic names found in the dataset under review aligned with the World of Flora Online as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-resolved-worms.csv.gz	taxonomic names found in the dataset under review aligned with the World Register of Marine Species (WoRMS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped comma-separated values format
indexed-names-resolved-worms.html.gz	taxonomic names found in the dataset under review aligned with the World Register of Marine Species (WoRMS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped html format
indexed-names-resolved-worms.tsv.gz	taxonomic names found in the dataset under review aligned with the World Register of Marine Species (WoRMS) as accessed through the Nomer Corpus of Taxonomic Resources (J. H. (ed.). Poelen 2024) in gzipped tab-separated values format
indexed-names-sample.csv	first 500 taxonomic names found in the dataset under review in comma-separated values format
indexed-names-sample.html	first 500 taxonomic names found in the dataset under review in html format

filename	description
indexed-names-sample.tsv	first 500 taxonomic names found in the dataset under review in tab-separated values format
interaction.svg	diagram summarizing the data model used to index species interaction claims
nanopub-sample.trig	first 500 species interaction claims as expressed in the nanopub format (Kuhn and Dumontier 2014)
nanopub.trig.gz	species interaction claims as expressed in the nanopub format (Kuhn and Dumontier 2014)
process.svg	diagram summarizing the data review processing workflow
prov.nq	origin of the dataset under review as expressed in rdf/nquads
review.csv.gz	review notes associated with the dataset under review in gzipped comma-separated values format
review.html.gz	review notes associated with the dataset under review in gzipped html format
review.tsv.gz	review notes associated with the dataset under review in gzipped tab-separated values format
review-sample.csv	first 500 review notes associated with the dataset under review in comma-separated values format
review-sample.html	first 500 review notes associated with the dataset under review in html format
review-sample.tsv	first 500 review notes associated with the dataset under review in tab-separated values format
review.svg	a review badge generated as part of the dataset review process
zenodo.json	metadata of this review expressed in Zenodo record metadata

Archived Dataset

Note that *data.zip* file in this archive contains the complete, unmodified archived dataset under review.
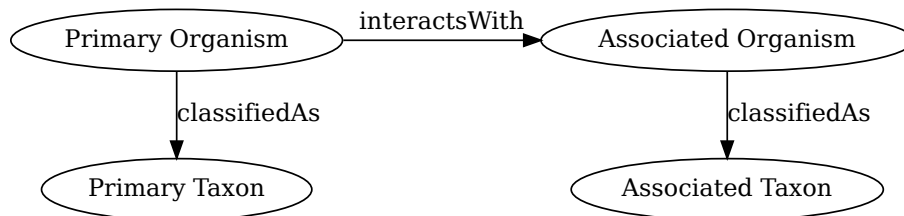
Biotic Interactions

Figure 2: Biotic Interaction Data Model

In this review, biotic interactions (or biotic associations) are modeled as a primary (aka subject, source) organism interacting with an associate (aka object, target) organism. The dataset under review classified the primary/associate organisms with specific taxa. The primary and associate organisms The kind of interaction is documented as an interaction type.

The dataset under review, named globalbioticinteractions/fmnh, has fingerprint hash://md5/e0d0c1436b55ec3ce1f661a9965bcc4f, is 1.12GiB in size and contains 128,976 interaction with 8 unique types of associations (e.g., adjacentTo) between 22,370 primary taxon (e.g., Trichobius joblingi Wenzel, 1966) and 33,924 associated taxon (e.g., Carollia perspicillata).

An exhaustive list of indexed interaction claims can be found in gzipped csv and tsv archives. To facilitate discovery, a preview of claims available in the gzipped html page at indexed-interactions.html.gz are shown below.

The exhaustive list was used to create the following data summaries below.

Table 3: Sample of Indexed Interaction Claims

sourceTaxonName	interactionTypeName	targetTaxonName	referenceCitation
Berchemia yunnanensis Franch.	interactsWith	forested area at higher elevations to disturbed forests to thickets and clearcuts at lower elevations	3279363a-d651-4b74-b5d4-3fd2dcd529e6
Rorippa elata (Hook. f. & Thomson) Hand.-Mazz.	interactsWith	forested area at higher elevations to disturbed forests to thickets and clearcuts at lower elevations	200d0765-9bbc-49a5-96bb-ad8a073b0d0b

sourceTaxonName	interactionTypeName	targetTaxonName	referenceCitation
Rodgersia pinnata var. strigosa J. T. Pan	interactsWith	forested area at higher elevations to disturbed forests to thickets and clearcuts at lower elevations. Forest.	1568a549-b4af-43fc-9632-379f5f67fe65
Primula anisodora Balf. f. & Forrest	interactsWith	forested area at higher elevations to disturbed forests to thickets and clearcuts at lower elevations	606fbdb9-6b91-454f-bdde-d8f189d13711

Table 4: Most Frequently Mentioned Interaction Types (up to 20 most frequent)

interactionTypeName	count
adjacentTo	92353
ectoparasiteOf	34988
interactsWith	882
parasiteOf	564
hasHost	175
eats	11
hostOf	2
eatenBy	1

Table 5: Most Frequently Mentioned Primary Taxa (up to 20 most frequent)

sourceTaxonName	count
Trichobius joblingi Wenzel, 1966	2639
Marchantiophyta Stotler & Crand.-Stotl.	1516
Megistopoda aranea (Coquillétt, 1899)	1287
Megistopoda proxima (Séguy, 1926)	1162
Trichobius parasiticus Gervais, 1844	1012
Strebla guajiro (Garcia & Casal, 1965)	1000
Strebla wiedemanni Kolenati, 1856	946
Aspidoptera phyllostomatis (Perty, 1833)	820
Speiseria ambigua Kessel, 1925	779

sourceTaxonName	count
Fungus indet.	730
Aspidoptera falcata Wenzel, 1976	720
Hippoboscoidea	609
Paratrichobius longicrus (Miranda Ribeiro, 1907)	597
Trichobius costalimai Guimarães, 1938	573
Nycterophilia coxata Ferris, 1916	543
Usnea Dill. ex Adans.	516
Ixodida Leach, 1815	505
Trichobius dugesii Townsend, 1891	492
Trichobioides perspicillatus (Pessoa & Galvao, 1937)	422

Table 6: Most Frequently Mentioned Associate Taxa (up to 20 most frequent)

targetTaxonName	count
Carollia perspicillata	2692
Artibeus jamaicensis	1740
Desmodus rotundus	1564
Sturnira lilium	1527
ground	1398
tree	1221
rocks	1174
Phyllostomus discolor	1123
log	1003
dead wood	831
Pteronotus parnellii	792
soil	791
Carollia brevicauda	776
trees	682
Carollia perspicillata azteca	649
beach	638
leaf litter	638
Glossophaga soricina	629
Artiodactyla	618

Table 7: Most Frequent Interactions between Primary and Associate Taxa (up to 20 most frequent)

sourceTaxonName	interactionTypeName	targetTaxonName	count
Trichobius joblingi Wenzel, 1966	ectoparasiteOf	Carollia perspicillata	1377
Megistopoda proxima (Séguy, 1926)	ectoparasiteOf	Sturnira lilium	906
Megistopoda aranea (Coquillétt, 1899)	ectoparasiteOf	Artibeus jamaicensis	793
Trichobius parasiticus Gervais, 1844	ectoparasiteOf	Desmodus rotundus	775
Strebla wiedemanni Kolenati, 1856	ectoparasiteOf	Desmodus rotundus	697
Strebla guajiro (Garcia & Casal, 1965)	ectoparasiteOf	Carollia perspicillata	570
Aspidoptera falcata Wenzel, 1976	ectoparasiteOf	Sturnira lilium	520
Aspidoptera phyllostomatis (Perty, 1833)	ectoparasiteOf	Artibeus jamaicensis	504
Trichobius costalimai Guimarães, 1938	ectoparasiteOf	Phyllostomus discolor	454
Speiseria ambigua Kessel, 1925	ectoparasiteOf	Carollia perspicillata	366
Paratrichobius longicrus (Miranda Ribeiro, 1907)	ectoparasiteOf	Artibeus lituratus	351
Trichobioides perspicillatus (Pessoa & Galvao, 1937)	ectoparasiteOf	Phyllostomus discolor	340
Trichobius joblingi Wenzel, 1966	ectoparasiteOf	Carollia perspicillata azteca	317

sourceTaxonName	interactionTypeName	targetTaxonName	count
Trichobius caecus Edwards, 1918	ectoparasiteOf	Pteronotus parnellii	292
Strebla hertigi Wenzel, 1966	ectoparasiteOf	Phyllostomus discolor	284
Nycterophilia coxata Ferris, 1916	ectoparasiteOf	Leptonycteris curasoae	272
Trichobius dugesii Townsend, 1891	ectoparasiteOf	Glossophaga soricina	259
Trichobius joblingi Wenzel, 1966	ectoparasiteOf	Carollia brevicauda	256
Trichobius longipes (Rudow, 1871)	ectoparasiteOf	Phyllostomus hastatus	244

Interaction Networks

The figures below provide a graph view on the dataset under review. The first shows a summary network on the kingdom level, and the second shows how interactions on the family level. It is important to note that both network graphs were first aligned taxonomically using the Catalogue of Life. Please refer to the original (or verbatim) taxonomic names for a more original view on the interaction data.
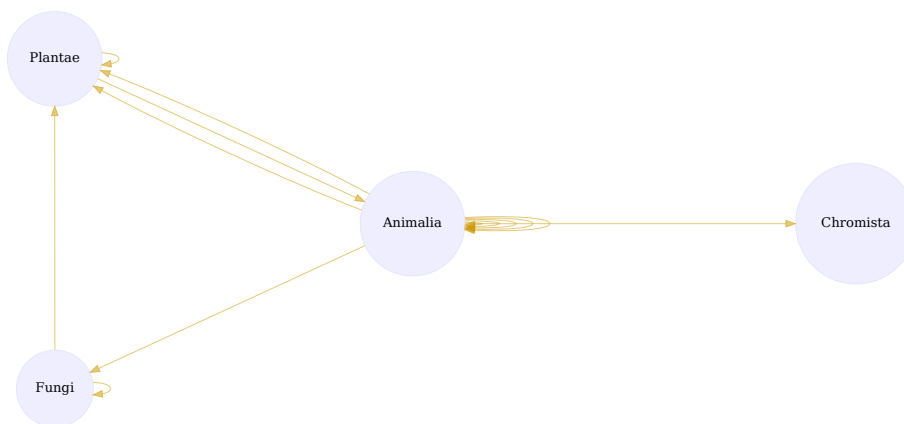

Figure 3: Interactions on taxonomic kingdom rank as interpreted by the Catalogue of Life download svg

You can download the indexed dataset under review at indexed-interactions.csv .gz. A tab-separated file can be found at indexed-interactions.tsv.gz
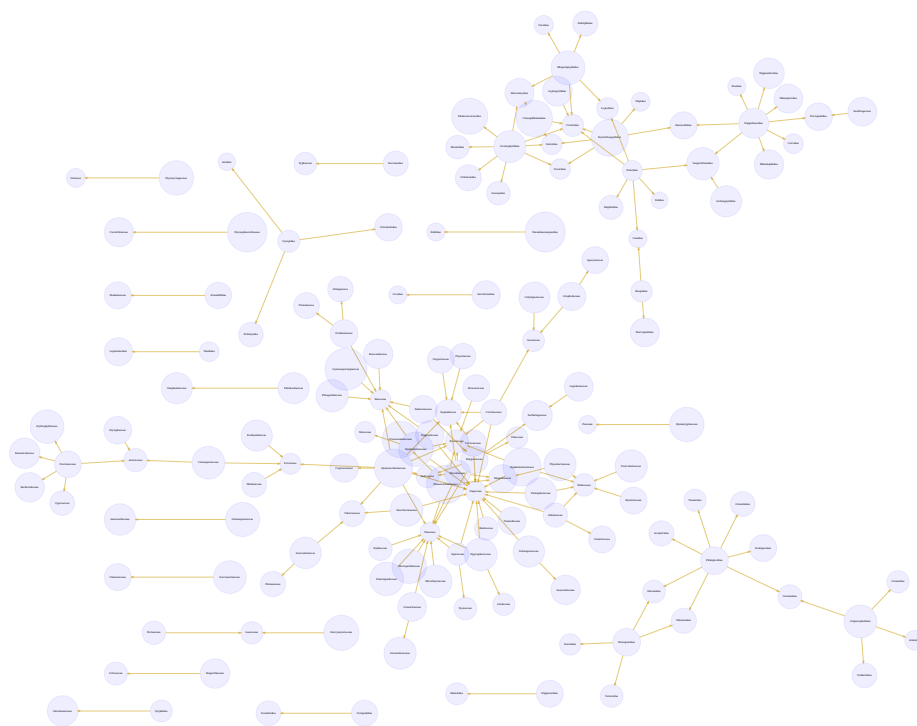
Figure 4: Interactions on the taxonomic family rank as interpreted by the Catalogue of Life. download svg

Learn more about the structure of this download at GloBI website, by opening a GitHub issue, or by sending an email.

Another way to discover the dataset under review is by searching for it on the GloBI website.

Taxonomic Alignment

As part of the review, all names are aligned against various name catalogs (e.g., col, ncbi, discoverlife, gbif, itis, wfo, mdd, tpt, pbdb, and worms). These alignments can help review name usage or aid in selecting of a suitable taxonomic name resource.

Table 8: Sample of Name Alignments

providedName	relationName	resolvedCatalogName	resolvedName
Tall	NONE	col	Tall
Ft peat over sand	NONE	col	Ft peat over sand
Cm diam trunk bog pine	NONE	col	Cm diam trunk bog pine
Diam trunk	NONE	col	Diam trunk

Table 9: Distribution of Taxonomic Ranks of Aligned Names by Catalog. Names that were not aligned with a catalog are counted as NAs. So, the total number of unaligned names for a catalog will be listed in their NA row.

resolvedCatalogName	resolvedRank	count
col	NA	23702
col	class	23
col	family	154
col	form	3
col	genus	1954
col	gigaclass	1
col	infraorder	3
col	kingdom	3
col	order	50
col	parvorder	1
col	phylum	18
col	section	1
col	species	20990
col	subclass	6
col	subfamily	5
col	subgenus	46
col	suborder	3

resolvedCatalogName	resolvedRank	count
col	subspecies	882
col	superclass	1
col	superfamily	4
col	tribe	1
col	variety	223
discoverlife	NA	47727
gbif	NA	21506
gbif	class	25
gbif	family	168
gbif	form	29
gbif	genus	2045
gbif	kingdom	4
gbif	order	49
gbif	phylum	19
gbif	species	22916
gbif	subspecies	1095
gbif	variety	470
itis	NA	37588
itis	class	24
itis	division	8
itis	family	158
itis	genus	1335
itis	infraorder	2
itis	kingdom	3
itis	order	56
itis	phylum	13
itis	species	7928
itis	subclass	9
itis	subfamily	6
itis	subgenus	5
itis	suborder	3
itis	subphylum	2
itis	subspecies	392
itis	superclass	1
itis	superfamily	3
itis	variety	217
mdd	NA	47726
ncbi	NA	32241
ncbi	clade	8
ncbi	class	23
ncbi	family	155
ncbi	forma	1
ncbi	forma specialis	2
ncbi	genus	1854

resolvedCatalogName	resolvedRank	count
ncbi	infraorder	4
ncbi	kingdom	2
ncbi	order	54
ncbi	phylum	14
ncbi	section	1
ncbi	species	13112
ncbi	subclass	10
ncbi	subfamily	7
ncbi	subgenus	9
ncbi	suborder	2
ncbi	subphylum	1
ncbi	subspecies	191
ncbi	subtribe	1
ncbi	superclass	1
ncbi	superfamily	5
ncbi	tribe	3
ncbi	varietas	37
pbdb	NA	45782
pbdb	class	28
pbdb	family	124
pbdb	genus	692
pbdb	informal	2
pbdb	infraorder	3
pbdb	kingdom	3
pbdb	order	52
pbdb	phylum	18
pbdb	species	995
pbdb	subclass	8
pbdb	subfamily	8
pbdb	subgenus	2
pbdb	suborder	5
pbdb	subspecies	3
pbdb	superclass	1
pbdb	superfamily	4
pbdb	superorder	3
pbdb	superphylum	2
pbdb	tribe	2
pbdb	unranked clade	10
tpt	NA	46533
tpt	family	3
tpt	genus	130
tpt	order	2
tpt	species	1058
wfo	NA	39159

resolvedCatalogName	resolvedRank	count
wfo	family	39
wfo	form	3
wfo	genus	927
wfo	phylum	1
wfo	section	1
wfo	species	7323
wfo	subsection	1
wfo	subspecies	227
wfo	tribe	1
wfo	variety	187
worms	NA	42475
worms	class	24
worms	family	136
worms	genus	926
worms	gigaclass	1
worms	infraclass	1
worms	infraorder	3
worms	kingdom	3
worms	order	52
worms	phylum	11
worms	phylum (division)	7
worms	species	3905
worms	subclass	8
worms	subfamily	2
worms	suborder	3
worms	subphylum	2
worms	subspecies	170
worms	superclass	1
worms	superfamily	4
worms	variety	53

Table 10: Name relationship types per catalog. Name relationship type "NONE" means that a name was not recognized by the associated catalog. "SAME_AS" indicates either a "HAS_ACCEPTED_NAME" or "SYNONYM_OF" name relationship type. We recognize that "SYNONYM_OF" encompasses many types of nomenclatural synonymies (ICZN 1999) (e.g., junior synonym, senior synonyms).

resolvedCatalogName	relationName	count
col	NONE	30906
col	HAS_ACCEPTED_NAME	18850

resolvedCatalogName	relationName	count
col	SYNONYM_OF	12220
discoverlife	NONE	58099
gbif	NONE	28589
gbif	HAS_ACCEPTED_NAME	24641
gbif	SYNONYM_OF	16946
itis	NONE	45255
itis	HAS_ACCEPTED_NAME	10109
itis	SYNONYM_OF	3144
mdd	NONE	57256
mdd	SYNONYM_OF	31
mdd	HAS_ACCEPTED_NAME	737
ncbi	NONE	39813
ncbi	SAME_AS	15672
ncbi	SYNONYM_OF	2736
ncbi	COMMON_NAME_OF	7
pbdb	NONE	55073
pbdb	HAS_ACCEPTED_NAME	2857
pbdb	SYNONYM_OF	242
tpt	NONE	56787
tpt	SYNONYM_OF	103
tpt	HAS_ACCEPTED_NAME	1208
wfo	NONE	46849
wfo	HAS_ACCEPTED_NAME	7954
wfo	SYNONYM_OF	4271
wfo	HAS_UNCHECKED_NAME	1612
worms	NONE	51847
worms	HAS_ACCEPTED_NAME	5817
worms	SYNONYM_OF	1407

Table 11: List of Available Name Alignment Reports

catalog name	alignment results
col	associated names alignments report in gzipped html, csv, and tsv)
ncbi	associated names alignments report in gzipped html, csv, and tsv)
discoverlife	associated names alignments report in gzipped html, csv, and tsv)
gbif	associated names alignments report in gzipped html, csv, and tsv)
itis	associated names alignments report in gzipped html, csv, and tsv)

catalog name	alignment results
wfo	associated names alignments report in gzipped html, csv, and tsv)
mdd	associated names alignments report in gzipped html, csv, and tsv)
tpt	associated names alignments report in gzipped html, csv, and tsv)
pbdb	associated names alignments report in gzipped html, csv, and tsv)
worms	associated names alignments report in gzipped html, csv, and tsv)

Additional Reviews

Elton, Nomer, and other tools may have difficulties interpreting existing species interaction datasets. Or, they may misbehave, or otherwise show unexpected behavior. As part of the review process, detailed review notes are kept that document possibly misbehaving, or confused, review bots. An sample of review notes associated with this review can be found below.

Table 12: First few lines in the review notes.

reviewDate	reviewCommentType	reviewComment
2025-04-10T19:13:22Z	note	found unresolved reference [c8bdd05a-1fad-44c3-96fa-367fb96ec0de]
2025-04-10T19:13:22Z	note	found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:1878...
2025-04-10T19:13:22Z	note	found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:1883...
2025-04-10T19:13:22Z	note	found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:8302]

In addition, you can find the most frequently occurring notes in the table below.

Table 13: Most frequently occurring review notes, if any.

reviewComment	count
found unresolved reference [c8bdd05a-1fad-44c3-96fa-367fb96ec0de]	1
found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:18783]	1
found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:18830]	1
found unresolved reference [https://arctos.database.museum/guid/CHAS:Bird:8302]	1

For additional information on review notes, please have a look at the first 500 Review Notes in html format or the download full gzipped csv or tsv archives.

GloBI Review Badge

As part of the review, a review badge is generated. This review badge can be included in webpages to indicate the review status of the dataset under review.

Figure 5: Picture of a GloBI Review Badge [3]

Note that if the badge is green, no review notes were generated. If the badge is yellow, the review bots may need some help with interpreting the species interaction data.

GloBI Index Badge

If the dataset under review has been registered with GloBI, and has been succesfully indexed by GloBI, the GloBI Index Status Badge will turn green. This means that the dataset under review was indexed by GloBI and is available through GloBI services and derived data products.

Figure 6: Picture of a GloBI Index Badge [4]

If you'd like to keep track of reviews or index status of the dataset under review, please visit GloBI's dataset index [5] for badge examples.

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[3] Up-to-date status of the GloBI Review Badge can be retrieved from the GloBI Review Depot

[4] Up-to-date status of the GloBI Index Badge can be retrieved from GloBI's API

[5] At time of writing (2025-04-10) the version of the GloBI dataset index was available at

Discussion

This review and archive provides a means of creating citable versions of datasets that change frequently. This may be useful for dataset managers, including natural history collection data managers, as a backup archive of a shared Darwin Core archive. It also serves as a means of creating a trackable citation for the dataset in an automated way, while also including some information about the contents of the dataset.

This review aims to provide a perspective on the dataset to aid in understanding of species interaction claims discovered. However, it is important to note that this review does *not* assess the quality of the dataset. Instead, it serves as an indication of the open-ness[6] and FAIRness (Wilkinson et al. 2016; Trekels et al. 2023) of the dataset: to perform this review, the data was likely openly available, **F**indable, **A**ccessible, **I**nteroperable and **R**eusable. The current Open-FAIR assessment is qualitative, and a more quantitative approach can be implemented with specified measurement units.

This report also showcases the reuse of machine-actionable (meta)data, something highly recommended by the FAIR Data Principles (Wilkinson et al. 2016). Making (meta)data machine-actionable enables more precise procesing by computers, enabling even naive review bots like Nomer and Elton to interpret the data effectively. This capability is crucial for not just automating the generation of reports, but also for facilitating seamless data exchanges, promoting interoperability.

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Author contributions

Nomer was responsible for name alignments. Elton carried out dataset extraction, and generated the review notes. Preston tracked, versioned, and packaged, the dataset under review.

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https://globalbioticinteractions.org/datasets

[6]According to http://opendefinition.org/: "Open data is data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike."

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