

Versioned Archive and Review of Biotic
Interactions and Taxon Names Found within
globalbioticinterac-
tions/ATLANTIC_POLLINATION
hash://md5/4c54b4ee4f0c3c509166872f6559ce3a

by Nomer, Elton and Preston, three naive review bots
review@globalbioticinteractions.org
<https://globalbioticinteractions.org/contribute>
https://github.com/globalbioticinteractions/ATLANTIC_POLLINATION/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/ATLANTIC_POLLINATION, has fingerprint hash://md5/4c54b4ee4f0c3c509166872f6559ce3a, is 3.65MiB in size and contains 3,762 interaction with 1 unique type of association (e.g., pollinates) between 150 primary taxa (e.g., *Thalurania glaucopis*) and 590 associated taxa (e.g., *Fuchsia regia*). This report includes detailed summaries of interaction data, a taxonomic review from multiple catalogs, and an archived version of the dataset from which the reviews are derived.

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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:

Iamara-Nogueira, J., Targhetta, N., Allain, G., Gambarini, A., Pinto, A. R., Rui, A. M., Araújo, A. C., Lopes, A., Pereira-Silva, B., de Camargo, B. B., Machado, C. G., Missagia, C., Scultori, C., Boscolo, D., Fischer, E., Araújo-Oliveira, E. S., Gava, H., Paulino-Neto, H. F., Machado, I. C., Varassin, I. G., Sazima, I., Vizenin-Bugoni, J., Silva, J. L. S., de Oliveira Ferreira, J., Narita, J., dos Santos, J. S., Agostini, K., Freitas, L., Lopes, L. E., Carvalho-Leite, L. J., Tabarelli, M., Rocca, M. A., Malanotte, M. L., Alves, M. A. S., Canela, M. B. F., Darrigo, M. R., Moreira, M. M., Wolowski, M., Sazima, M., Galetti, M., Ribeiro, M. C., Groppo, M., Kaehler, M., Batista, M. d. A., Neto, O. C., Ferreira, P. A., Bergamo, P. J., Maruyama, P. K., Bueno, R. O., Leal, R. L. B., Faria, R. R., Bazarian, S., Malucelli, T., and Buzato, S.. 2022. ATLANTIC POLLINATION: a data set of flowers and interaction with nectar-feeding vertebrates from the Atlantic Forest. *Ecology* 103(2):e03595. 10.1002/ecy.3595 https://github.com/globalbioticinteractions/ATLANTIC_POLLINATION/archive/f42e32776f8a57e54132025-07-11T22:57:14.713Z hash://md5/4c54b4ee4f0c3c509166872f6559ce3a

For additional metadata related to this dataset, please visit https://github.com/globalbioticinteractions/ATLANTIC_POLLINATION 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	0.15.13
nomer	0.5.17
globinizer	0.4.0
mlr	6.0.0
jq	1.6
yq	4.25.3
pandoc	3.1.6.1
duckdb	1.3.1

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

```
# get versioned copy of the dataset (size approx. 3.65MiB) under review
elton pull globalbioticinteractions/ATLANTIC_POLLINATION

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

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

# export names and align them with the Catalogue of Life using Nomer
elton names globalbioticinteractions/ATLANTIC_POLLINATION\
```

¹Note that you have to first get the data (e.g., via `elton pull globalbioticinteractions/ATLANTIC_POLLINATION`) before being able to generate reviews (e.g., `elton review globalbioticinteractions/ATLANTIC_POLLINATION`), extract interaction claims (e.g., `elton interactions globalbioticinteractions/ATLANTIC_POLLINATION`), or list taxonomic names (e.g., `elton names globalbioticinteractions/ATLANTIC_POLLINATION`)

```
| nomer append col\  
> name-alignment.tsv
```

or visually, in a process diagram.

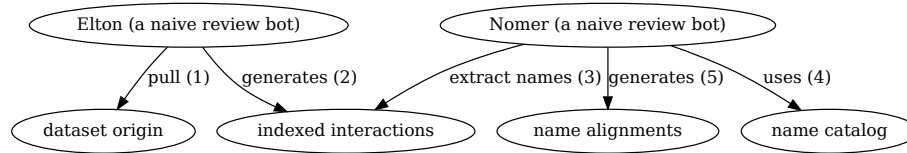


Figure 1: Review Process Overview

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 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

²Disclaimer: 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.html.gz	list of distinct reference citations for reviewed species interactions claims in gzipped html file format
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 kingdom 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.parquet	species interaction claims indexed from the dataset under review in Apache Parquet 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

filename	description
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
indexed-names.parquet	taxonomic names found in the dataset under review in Apache Parquet format
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-col.parquet	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 Apache Parquet 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

filename	description
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
indexed-names-resolved-discoverlife.parquet	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 Apache Parquet format
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

filename	description
indexed-names-resolved-gbif.parquet	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 Apache Parquet 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
indexed-names-resolved-itis.parquet	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 Apache Parquet format
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

filename	description
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-mdd.parquet	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 Apache Parquet 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-ncbi.parquet	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 Apache Parquet format
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-pbdb.parquet	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 Apache Parquet 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

filename	description
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
indexed-names-resolved-tpt.parquet	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 Apache Parquet format
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

filename	description
indexed-names-resolved-wfo.parquet	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 Apache Parquet 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-resolved-worms.parquet	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 Apache Parquet 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
indexed-names-sample.tsv	first 500 taxonomic names found in the dataset under review in tab-separated values format

filename	description
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.

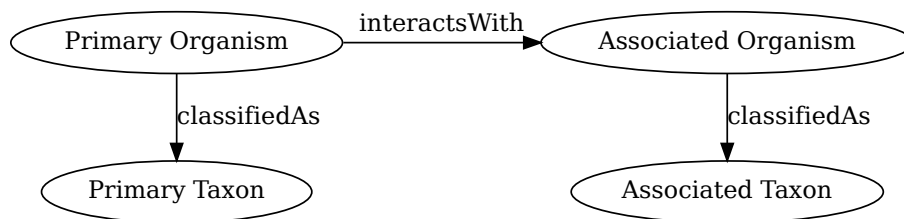


Figure 2: Biotic Interaction Data Model

Biotic Interactions

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/ATLANTIC_POLLINATION`, has fingerprint hash: `//md5/4c54b4ee4f0c3c509166872f6559ce3a`, is 3.65MiB in size and contains 3,762 interaction with 1 unique type of association (e.g., pollinates) between 150 primary taxa (e.g., *Thalurania glaucopis*) and 590 associated taxa (e.g., *Fuchsia regia*).

An exhaustive list of indexed interaction claims can be found in gzipped csv, tsv and parquet 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.

sourceTaxonName	interactionType	targetTaxonName	referenceCitation
-----------------	-----------------	-----------------	-------------------

Table 3: Sample of Indexed Interaction Claims

sourceTaxonName	interactionType	targetTaxonName	referenceCitation
Amazilia fimbriata	pollinates	Geissomeria schottiana	Iamara-Nogueira, J., Targhetta, N., Allain, G., Gambarini, A., Pinto, A. R., Rui, A. M., Araújo, A. C., Lopes, A., Pereira-Silva, B., de Camargo, B. B., Machado, C. G., Missagia, C., Scultori, C., Boscolo, D., Fischer, E., Araújo-Oliveira, E. S., Gava, H., Paulino-Neto, H. F., Machado, I. C., Varassin, I. G., Sazima, I., Vizentin-Bugoni, J., Silva, J. L. S., de Oliveira Ferreira, J., Narita, J., dos Santos, J. S., Agostini, K., Freitas, L., Lopes, L. E., Carvalho-Leite, L. J., Tabarelli, M., Rocca, M. A., Malanotte, M. L., Alves, M. A. S., Canela, M. B. F., Darrigo, M. R., Moreira, M. M., Wolowski, M., Sazima, M., Galetti, M., Ribeiro, M. C., Groppo, M., Kaehler, M., Batista, M. d. A., Neto, O. C., Ferreira, P. A., Bergamo, P. J., Maruyama, P. K., Bueno, R. O., Leal, R. L. B., Faria, R. R.

sourceTaxonName	interactionType	targetTaxonName	referenceCitation
Phaethornis pretrei	pollinates	Geissomeria schottiana	Iamara-Nogueira, J., Targhetta, N., Allain, G., Gambarini, A., Pinto, A. R., Rui, A. M., Araújo, A. C., Lopes, A., Pereira-Silva, B., de Camargo, B. B., Machado, C. G., Missagia, C., Scultori, C., Boscolo, D., Fischer, E., Araújo-Oliveira, E. S., Gava, H., Paulino-Neto, H. F., Machado, I. C., Varassin, I. G., Sazima, I., Vizentin-Bugoni, J., Silva, J. L. S., de Oliveira Ferreira, J., Narita, J., dos Santos, J. S., Agostini, K., Freitas, L., Lopes, L. E., Carvalho-Leite, L. J., Tabarelli, M., Rocca, M. A., Malanotte, M. L., Alves, M. A. S., Canela, M. B. F., Darrigo, M. R., Moreira, M. M., Wolowski, M., Sazima, M., Galetti, M., Ribeiro, M. C., Groppo, M., Kaehler, M., Batista, M. d. A., Neto, O. C., Ferreira, P. A., Bergamo, P. J., Maruyama, P. K., Bueno, R. O., Leal, R. L. B., Faria, R. R., Bazarian, S., Malucelli, T., and Buzato, S..

sourceTaxonName	interactionType	targetTaxonName	referenceCitation
Phaethornis ruber	pollinates	Geissomeria schottiana	Iamara-Nogueira, J., Targhetta, N., Allain, G., Gambarini, A., Pinto, A. R., Rui, A. M., Araújo, A. C., Lopes, A., Pereira-Silva, B., de Camargo, B. B., Machado, C. G., Missagia, C., Scultori, C., Boscolo, D., Fischer, E., Araújo-Oliveira, E. S., Gava, H., Paulino-Neto, H. F., Machado, I. C., Varassin, I. G., Sazima, I., Vizentin-Bugoni, J., Silva, J. L. S., de Oliveira Ferreira, J., Narita, J., dos Santos, J. S., Agostini, K., Freitas, L., Lopes, L. E., Carvalho-Leite, L. J., Tabarelli, M., Rocca, M. A., Malanotte, M. L., Alves, M. A. S., Canela, M. B. F., Darrigo, M. R., Moreira, M. M., Wolowski, M., Sazima, M., Galetti, M., Ribeiro, M. C., Grosso, M., Kaehler, M., Batista, M. d. A., Neto, O. C., Ferreira, P. A., Bergamo, P. J., Maruyama, P. K., Bueno, R. O., Leal, R. L. B., Faria, R. R., Bazarian, S., Malucelli, T., and Buzato, S..

sourceTaxonName	interactionType	targetTaxonName	referenceCitation
Phaethornis squalidus	pollinates	Geissomeria schottiana	Iamara-Nogueira, J., Targhetta, N., Allain, G., Gambarini, A., Pinto, A. R., Rui, A. M., Araújo, A. C., Lopes, A., Pereira-Silva, B., de Camargo, B. B., Machado, C. G., Missagia, C., Scultori, C., Boscolo, D., Fischer, E., Araújo-Oliveira, E. S., Gava, H., Paulino-Neto, H. F., Machado, I. C., Varassin, I. G., Sazima, I., Vizentin-Bugoni, J., Silva, J. L. S., de Oliveira Ferreira, J., Narita, J., dos Santos, J. S., Agostini, K., Freitas, L., Lopes, L. E., Carvalho-Leite, L. J., Tabarelli, M., Rocca, M. A., Malanotte, M. L., Alves, M. A. S., Canela, M. B. F., Darrigo, M. R., Moreira, M. M., Wolowski, M., Sazima, M., Galetti, M., Ribeiro, M. C., Groppo, M., Kaehler, M., Batista, M. d. A., Neto, O. C., Ferreira, P. A., Bergamo, P. J., Maruyama, P. K., Bueno, R. O., Leal, R. L. B., Faria, R. R., Bazarian, S., Malucelli, T., and Buzato, S..

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

interactionTypeName	count
pollinates	3762

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

sourceTaxonName	count
Thalurania glaucopis	505
Phaethornis eurynome	395
Ramphodon naevius	354
Leucochloris albicollis	215
Phaethornis ruber	213
Amazilia fimbriata	176
Clytolaema rubricauda	157
Stephanoxis lalandi	127
Phaethornis squalidus	123
Amazilia versicolor	108
Phaethornis pretrei	106
Anoura caudifer	97
Eupetomena macroura	80
Melanotrochilus fuscus	69
Glaucis hirsuta	64
Glossophaga soricina	63
Chlorostilbon aureoventris	62
Florisuga fusca	57
Coereba flaveola	49

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

targetTaxonName	count
Fuchsia regia	90
Erythrina speciosa	89
Erythrina falcata	60
Heliconia spathocircinata	51
Norantea brasiliensis	51
Tillandsia stricta	49
Aechmea distichantha	47

targetTaxonName	count
Aechmea nudicaulis	47
Abutilon aff.regnelii	46
Psychotria nuda	44
Dahlstedtia pinnata	44
Schwartzia brasiliensis	35
Mutisia speciosa	34
Inga sessilis	34
Costus spiralis	33
Pyrostegia venusta	32
Siphocampylus sulfureos	32
Vriesea procera	31
Erythrina verna	30

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

sourceTaxonName	interactionTypeName	targetTaxonName	count
Clytolaema rubricauda	pollinates	Fuchsia regia	17
Phaethornis eurynome	pollinates	Fuchsia regia	17
Ramphodon naevius	pollinates	Heliconia angusta	15
Leucochloris albicollis	pollinates	Fuchsia regia	15
Thalurania glaucopis	pollinates	Psychotria nuda	14
Ramphodon naevius	pollinates	Dahlstedtia pinnata	14
Thalurania glaucopis	pollinates	Heliconia spathocircinata	13
Ramphodon naevius	pollinates	Nidularium innocentii	12
Ramphodon naevius	pollinates	Billbergia pyramidalis	12
Ramphodon naevius	pollinates	Heliconia spathocircinata	12
Thalurania glaucopis	pollinates	Erythrina speciosa	11
Stephanoxis lalandi	pollinates	Fuchsia regia	11
Thalurania glaucopis	pollinates	Dahlstedtia pinnata	11
Ramphodon naevius	pollinates	Vriesea incurvata	10
Thalurania glaucopis	pollinates	Aechmea nudicaulis	10
Ramphodon naevius	pollinates	Aechmea pectinata	10
Clytolaema rubricauda	pollinates	Abutilon aff.regnelii	10
Leucochloris albicollis	pollinates	Abutilon aff.regnelii	10
Phaethornis eurynome	pollinates	Abutilon aff.regnelii	10

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

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
Abarema lusoria	NONE	col	Abarema lusoria
Abutilon	HAS_ACCEPTED_NAME	col	Abutilon
Abutilon bedfordianum	SYNONYM_OF	col	Callianthe bedfordiana
Abutilon peltatum	SYNONYM_OF	col	Callianthe fluviatilis

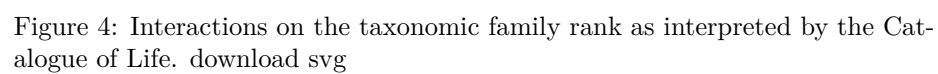


Table 9: Distribution of Taxonomic Ranks of Aligned Names by Catalog. Names that were not aligned with a catalog are counted as NAs. So, the total number of unaligned names for a catalog will be listed in their NA row.

resolvedCatalogName	resolvedRank	count
col	NA	87
col	genus	41
col	species	556
col	subspecies	5
col	variety	6
discoverlife	NA	692
gbif	NA	67
gbif	genus	42
gbif	species	574
gbif	subspecies	6
gbif	variety	8
itis	NA	439
itis	genus	34
itis	species	215
itis	subspecies	2
itis	variety	1
mdd	NA	691
ncbi	NA	191
ncbi	genus	41
ncbi	species	459
ncbi	varietas	1
pbdb	NA	662
pbdb	genus	14
pbdb	species	15
tpt	NA	588
tpt	genus	6
tpt	species	97
wfo	NA	202
wfo	genus	35
wfo	species	450
wfo	subspecies	3
wfo	variety	4
worms	NA	654
worms	genus	12
worms	species	25
worms	variety	1

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	88
col	HAS_ACCEPTED_NAME	554
col	SYNONYM_OF	152
discoverlife	NONE	745
gbif	NONE	68
gbif	HAS_ACCEPTED_NAME	650
gbif	SYNONYM_OF	230
itis	NONE	450
itis	HAS_ACCEPTED_NAME	254
itis	SYNONYM_OF	37
mdd	NONE	711
mdd	HAS_ACCEPTED_NAME	27
mdd	SYNONYM_OF	1
ncbi	NONE	198
ncbi	SAME_AS	508
ncbi	SYNONYM_OF	46
pbdb	NONE	697
pbdb	HAS_ACCEPTED_NAME	39
pbdb	SYNONYM_OF	3
tpt	NONE	621
tpt	HAS_ACCEPTED_NAME	113
tpt	SYNONYM_OF	5
wfo	NONE	218
wfo	HAS_ACCEPTED_NAME	449
wfo	SYNONYM_OF	93
wfo	HAS_UNCHECKED_NAME	19
worms	NONE	696
worms	HAS_ACCEPTED_NAME	40
worms	SYNONYM_OF	5

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)
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
2025-07-17T23:51:06Z	summary	https://github.com/globalbioticinteractions/ATLANTI
2025-07-17T23:51:06Z	summary	3762 interaction(s)
2025-07-17T23:51:06Z	summary	0 note(s)
2025-07-17T23:51:06Z	summary	3762 info(s)

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

: Most frequently occurring review notes, if any.

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 successfully 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.

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

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

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

⁵At time of writing (2025-07-18) the version of the GloBI dataset index was available at <https://globalbioticinteractions.org/datasets>

this review does *not* assess the quality of the dataset. Instead, it serves as an indication of the open-ness⁶ 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 processing 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.

References

- Elliott, Michael, Jorrit Poelen, Icaro Alzuru, Emilio Berti, and partha04patel. 2025. “Bio-Guoda/Preston: 0.10.5.” Zenodo. <https://doi.org/10.5281/zenodo.14662206>.
- ICZN. 1999. “International Code of Zoological Nomenclature.” The International Trust for Zoological Nomenclature, London, UK. <https://www.iczn.org/the-code/the-code-online/>.
- Kuhn, Tobias, and Michel Dumontier. 2014. “Trusty URIs: Verifiable, Immutable, and Permanent Digital Artifacts for Linked Data.” In *The Semantic Web: Trends and Challenges*, edited by Valentina Presutti, Claudia d’Amato,

⁶According to <http://opendefinition.org/>: “Open data is data that can be freely used, reused and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike.”

- Fabien Gandon, Mathieu d’Aquin, Steffen Staab, and Anna Tordai, 395–410. Cham: Springer International Publishing.
- Kuhn, Tobias, Jorrit Poelen, and Katrin Leinweber. 2025. “Globalbioticinteractions/Elton: 0.15.1.” Zenodo. <https://doi.org/10.5281/zenodo.14927734>.
- Poelen, Jorrit H. (ed.). 2024. “Nomer Corpus of Taxonomic Resources Hash://Sha256/ B60c0d25a16ae77b24305782017b1a270b79b5d1746f832650 F2027ba536e276 Hash://Md5/17f1363a277ee0e4ecaf1b91c665e47e.” Zenodo. <https://doi.org/10.5281/zenodo.12695629>.
- Poelen, Jorrit H., James D. Simons, and Chris J. Mungall. 2014. “Global Biotic Interactions: An Open Infrastructure to Share and Analyze Species-Interaction Datasets.” *Ecological Informatics* 24 (November): 148–59. <https://doi.org/10.1016/j.ecoinf.2014.08.005>.
- Poelen, Jorrit, Katja Seltmann, and Daniel Mietchen. 2024. “Globalbioticinteractions/Globinizer: 0.4.0.” Zenodo. <https://doi.org/10.5281/zenodo.10647565>.
- Salim, José Augusto, and Jorrit Poelen. 2025. “Globalbioticinteractions/Nomer: 0.5.15.” Zenodo. <https://doi.org/10.5281/zenodo.14893840>.
- Trekels, Maarten, Debora Pignatari Drucker, José Augusto Salim, Jeff Ollerton, Jorrit Poelen, Filipi Miranda Soares, Max Rünzel, Muo Kasina, Quentin Groom, and Mariano Devoto. 2023. “WorldFAIR Project (D10.1) Agriculture-related pollinator data standards use cases report.” Zenodo. <https://doi.org/10.5281/zenodo.8176978>.
- Wilkinson, Mark D., Michel Dumontier, IJsbrand Jan Aalbersberg, Gabrielle Appleton, Myles Axton, Arie Baak, Niklas Blomberg, et al. 2016. “The FAIR Guiding Principles for Scientific Data Management and Stewardship.” *Scientific Data* 3 (1). <https://doi.org/10.1038/sdata.2016.18>.