Biodiversity
Community
Integrated
Knowledge
Library

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Biotic Interactions Browser

SIBiLS

SWISS INSTITUTE OF BIOINFORMATICS
LITERATURE SERVICES

What is BiotXplorer?

BiotXplorer is an exploration tool to navigate biotic interactions in Biodiversity PMC, the largest digitally native repository of articles for biodiversity and environmental sciences.

It offers a free-to-use and no-registration-required portal to browse and locate relevant biotic interactions. BiotXplorer uses the Open Tree of Life taxonomy to describe species and the Relation Ontology (ROBI) to describe species interactions.

Who is BiotXplorer for?

BiotXplorer will support researchers seeking to explore biodiversity publications in context through in-depth bibliographic exploration of various types of biodiversity data (i.e. taxon names, taxonomic treatments, figures, tables).

What data is in BiotXplorer?

BiotXplorer is a noSQL database of biotic interactions extracted from the scientific literature. BiotXplorer indexes all abstracts from MEDLINE, as well as full-text articles from PMC, supplementary material files associated with publications, and half a million treatments from Plazi. The database also contains non-PMC articles from different journals (e.g., Pensoft or the European Journal of Taxonomy).
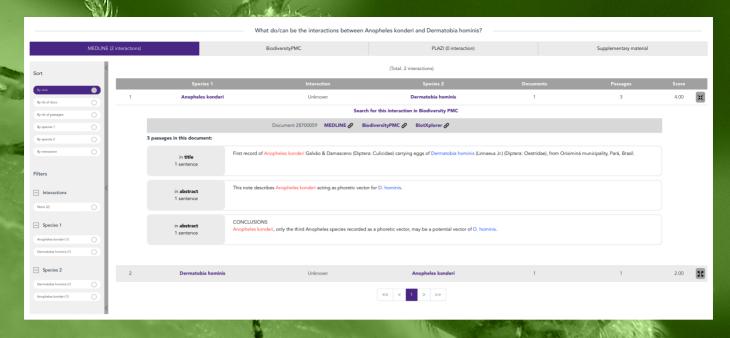
As of the moment of writing, the database contains about 79 million interactions at the sentence-level, computed over about 36 million abstracts and 5 million full-text, 6 million supplementary material documents and 713 thousand treatments from Plazi.

What does BiotXplorer do?

BiotXplorer pre-processes all documents from the SIB Literature Services (SIBiLS) to build pairs of species co-occurring in the same passage (e.g., a sentence). When a ROBI concept is identified in the passage, it is associated with the pair to form a triplet. This data is stored in a MongoDB database. A search service is built on top of this database. It aggregates all triplets matching the query, using taxonomy hierarchy to expand the search. With this tool, researchers can discover new biotic interactions and understand how they are supported by published evidence.

Example of a query to find the biotic interactions between *Anopheles konderi* and *Dermatobia hominis*.

https://denver.text-analytics.ch/BiotXplorer/?species1=Anopheles%20konderi&species2=Dermatobia%20hominis&size=1

What challenges does BiotXplorer address?

Our model addresses a critical challenge within the biodiversity research community – the overwhelming volume of data that often hinders valuable insights. In this context, our model's primary goal is to aid in the detection of biotic interactions across all species. While its precision is dependent on many factors, the vast amount of data it processes can reveal new information and patterns. The inclusion of evidence for each triplet serves as a mechanism for domain experts to validate the associations proposed by the model; thus moving closer to a global "One Health" library system.

Questions you can 'ask' to BiotXplorer (examples):

- Which species do/can interact with Pangolin?

- Which species are hosts of *Biomphalaria glabrata*?

- What is the interaction between *Phengaris arion* and *Myrmica sabuleti*?

- What evidence supports that *Oncomelania hupensis* and *Schistosoma japonicum* do/can interact ?

Two ways to query BiotXplorer:

1 User-friendly web interface   2 APIs   **1 Humans – 2 Computers**

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https://denver.hesge.ch/BiotXplorer/

Social media: @sibliterature (tbc)