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Domain Ontologies to Explore and Manage Functional Soil-invertebrate Diversity

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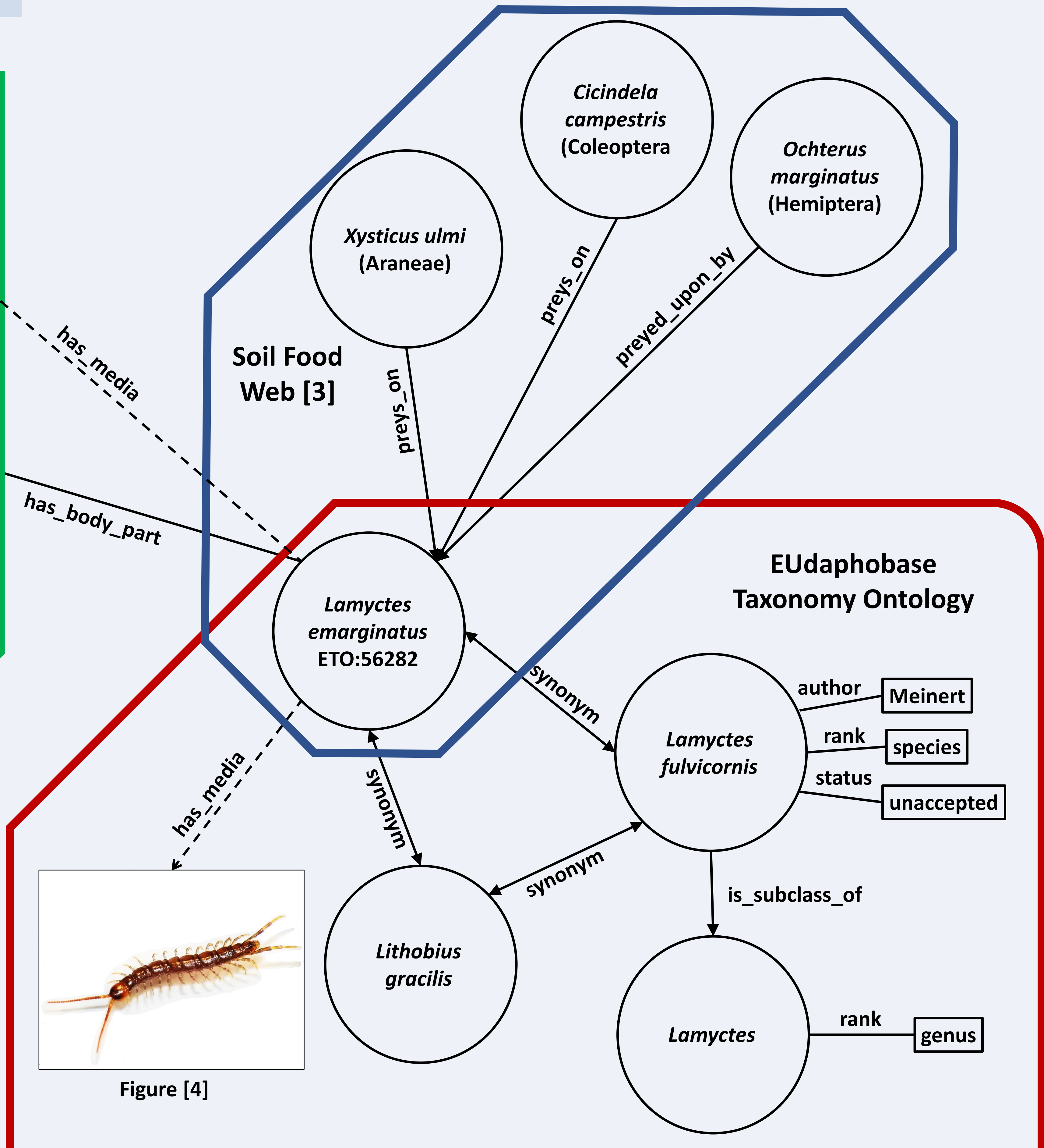
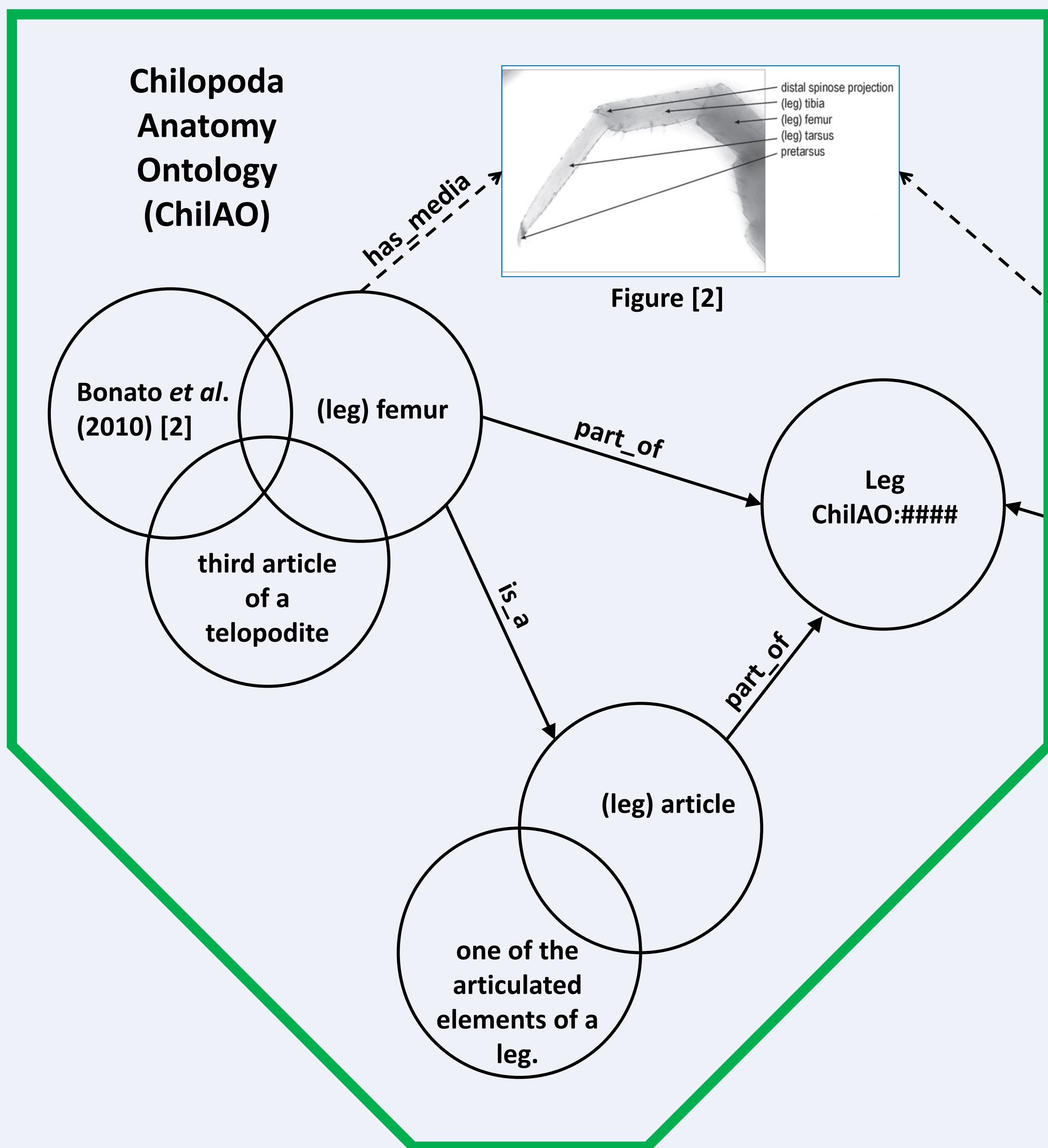
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Background

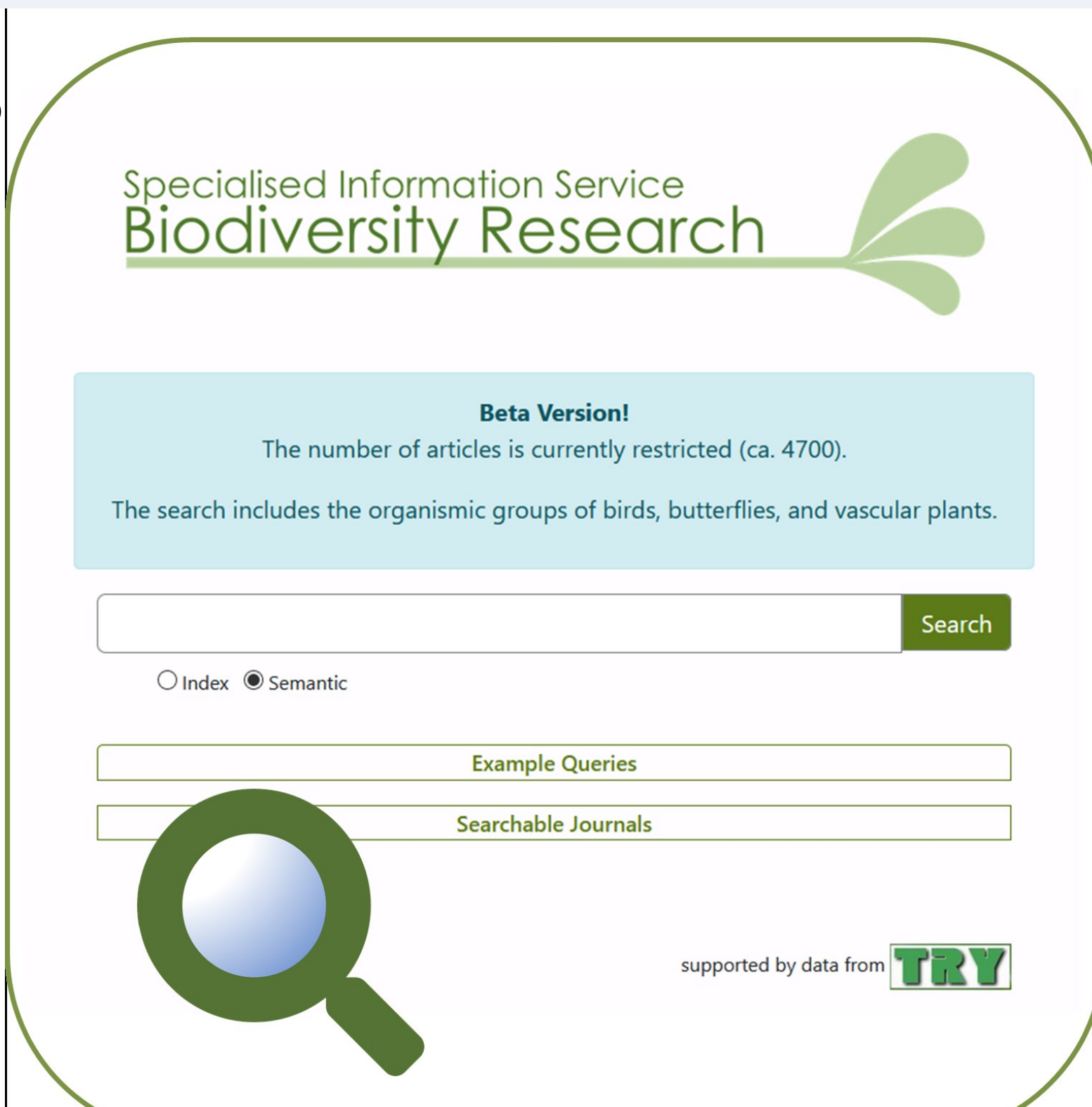
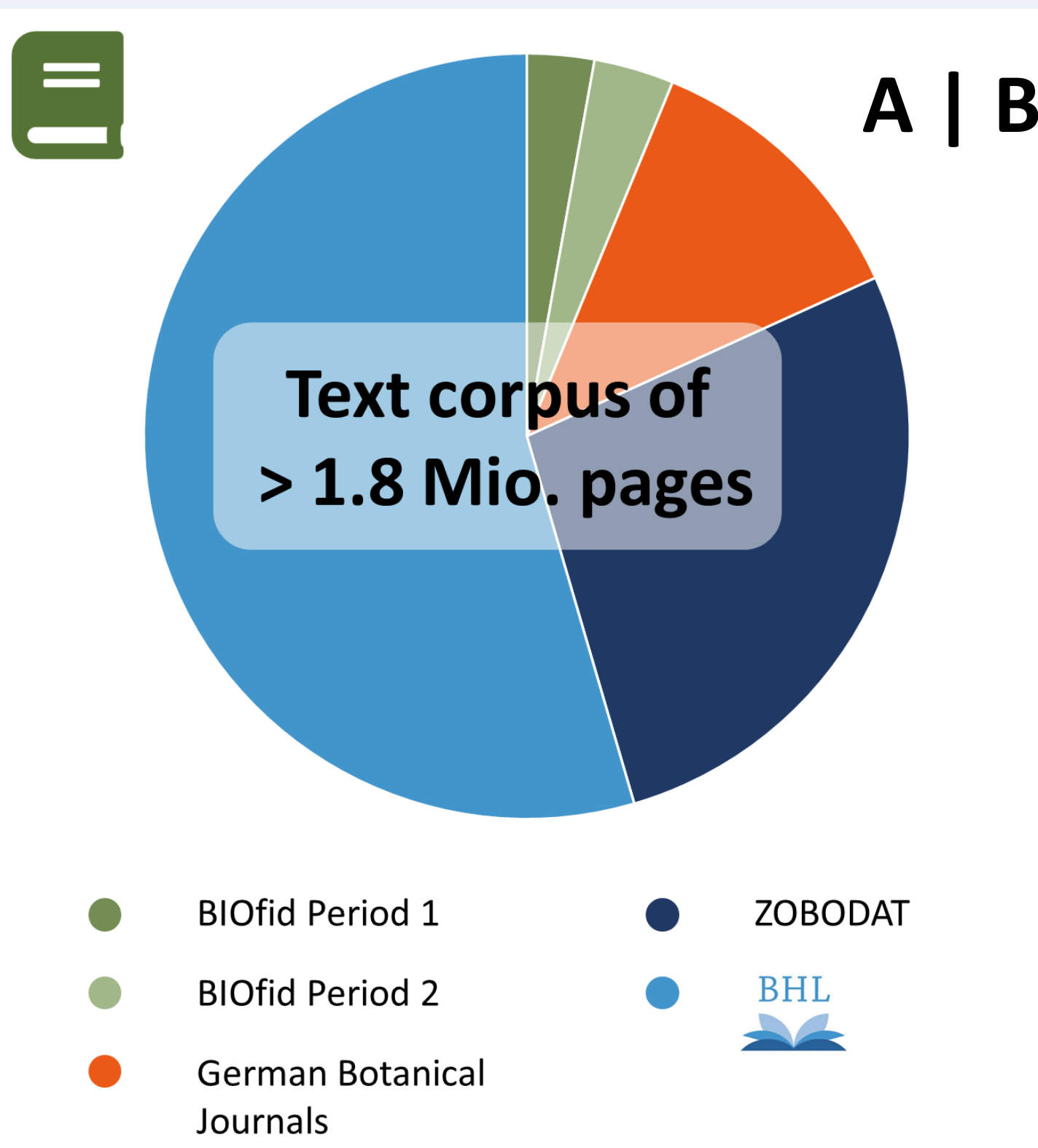
Due to their high structural and functional diversity, soil invertebrates are crucial for **ecosystem functioning** and its stability. This diversity is reflected not only in the multitude of quantitative and qualitative studies, but also in the range of existing vocabularies of characters and character states for functional **soil biodiversity**. Data mining and text mining are increasingly used to scour large data resources and systematically extract relevant information in a machine-based manner. **Controlled vocabularies** play a central role in applying these methods to represent implicit and explicit knowledge in so-called knowledge graphs in a structured and machine- and human-readable way.

Implementation

The **Specialized Information Service Biodiversity Research (BIOfid)** [1] aims at this method of data mobilization from Central European biodiversity literature. In cooperation with the **European Soil-Biology Data Warehouse for Soil Protection (EUdaphobase)**, differing vocabularies on the taxonomy, anatomy, ecology and traits of soil invertebrates are currently being harmonized and mapped onto **domain-specific ontologies**. In addition to data extraction, these ontologies should also support the **interoperable and sustainable management of pan-European soil biodiversity data**.



Schematic example of linked BIOfid-Eudaphobase ontologies. The Chilopoda Anatomy Ontology (ChilAO) is linked to the Eudaphobase Taxonomy Ontology, which can also support ontologies of ecological interactions between centipedes and other terrestrial invertebrates.



A. BIOfid corpus. Combined with ontologies, it enables the identification and recognition of information units (taxa, morphological structures) in historical literature.

B. BIOfid services and search portal. Full text queries can be performed with both a traditional index search and a semantic search. The search results can currently be downloaded in JSON format.

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