

Taxonomic Treatments as Open FAIR Digital Objects

Donat Agosti[‡], Alexandros Ioannidis-Pantopikos[§]

[‡] Plazi, Bern, Switzerland

[§] CERN, Meyrin, Switzerland

Corresponding author: Donat Agosti (agosti@plazi.org)

Abstract

Taxonomy is the science of charting and describing the world's biodiversity. Organisms are grouped into taxa which are given a given rank building the taxonomic hierarchy. The taxa are described in taxonomic treatments, well defined sections of scientific publications (Catapano 2019). They include a nomenclatural section and one or more sections including descriptions, material citations referring to studied specimens, or notes ecology and behavior. In case the treatment does not describe a new discovered taxon, previous treatments are cited in the form of treatment citations. This citation can refer to a previous treatment and add additional data, or it can be a statement synonymizing the taxon with another taxon. This allows building a citation network, and ultimately is a constituent part of the catalogue of life. Thus treatments play an important role to understand the diversity of life on Earth by providing the scientific argument why group of organism is a new species, or a synonym, and the data provided will increasingly be important to analyze and compare whole genomes of individual genomes.

Treatments have been extracted by Plazi since 2008 (Agosti and Egloff 2009), and the TaxPub schema has been described by Catapano (Catapano 2019) to complement existing vocabularies to allow annotation of legacy literature and to produce new publications including the respective annotations (Penev et al. 2010). Today, more than 750,000 treatments have been annotated by Plazi's TreatmentBank and over 400,000 have been made FAIR digital objects in the [Biodiversity Literature Repository](#) in a collaboration of Plazi, Zenodo and Pensoft (Ioannidis-Pantopikos and Agosti 2021, Agosti et al. 2019), and are reused by the Global Biodiversity Information Facility ([GBIF](#)), Global Biotic Interaction ([GloBI](#)), and the Library System of the Swiss Institute of Bioinformatics ([SIBiLS](#)).

Each treatment on the Zenodo repository is findable through its rich metadata. The insertion of custom metadata in Zenodo provides metadata referring to domain specific vocabularies such as Darwin Core (Ioannidis-Pantopikos and Agosti 2021). The treatment are accessible through its DataCite Digital Object Identifier (DOI) for the

taxonomic treatment as subtype of a publication. The data is interoperable by machine actionable JSON version of the treatment. A license is provided to assure it is reusable.

The richness of data and citations within a treatment provide a stepping stone to add treatments not only to knowledge systems such as Wikidata or openBioDiv, but to provide links to many of the cited objects, such as specimens through the material citations, and thus a well curated assemblage of links. Being a FAIR digital object, treatments can be cited and should ultimately linked to from a taxonomic name used in an identification of an organism.

Keywords

biodiversity, taxonomy, Zenodo, GBIF, SIBiLS, SIB

Presenting author

Donat Agosti

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Conflicts of interest

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