

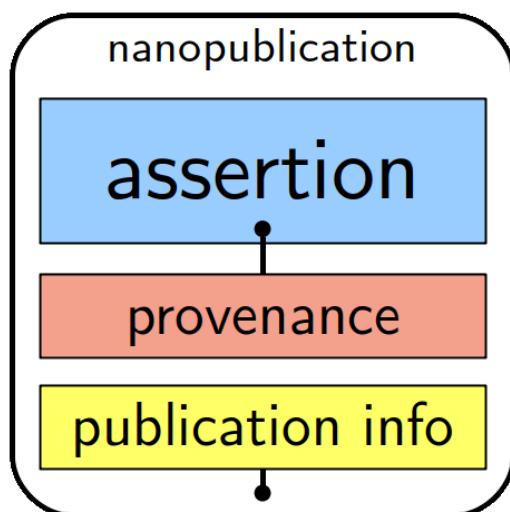
NANOPUBLICATIONS

What is a nanopublication?

A nanopublication is a simple assertion or - in other words - a tiny snippet of a **precise** and **structured scientific finding** (e.g. *medication X treats disease Y*), which **exists as a reusable** and **citable “atom”** from a **growing knowledge graph** stored on a decentralised server network.

Nanopublications use a standard format where each assertion comprises (1) a subject, (2) an object and (3) a relationship between the two. It is further complemented by provenance, authorship and publication information.

As a result, **scientific statements** expressed by means of nanopublications **become** both **human-readable** and **machine-actionable**, thus **interoperable**.



How is a BIODIVERSITY nanopublication any different?

This novel workflow and templates are designed to **support various types of relations between biodiversity subjects and other data** (e.g. between organisms, between taxa, between taxa and environments, between organisms and nucleotide sequences).

To do so, the **domain-specific workflow** and **templates rely on community-agreed** and widely used **standards** and **persistent identifiers**, using data and API services from [ChecklistBank](#), [Catalogue of Life](#), [GBIF](#), [GenBank/ENA](#), [BOLD](#), [Darwin Core](#), [Environmental Ontology \(ENVO\)](#), [Relation Ontology \(RO\)](#), [NOMEN](#), [ZooBank](#), [Index Fungorum](#), [Mycobank](#), [IPNI](#), [TreatmentBank](#) amongst others.

Why should biodiversity researchers care for nanopublications?

Nanopublications can be used by authors to ‘fragment’ their most important scientific findings into valuable ‘pixels of knowledge’, where **each assertion becomes findable, accessible, interoperable and reusable (FAIR)**.

By adding nanopublications into their research papers, authors ensure that **key scientific statements** – the ones underpinning their research work – **are efficiently**

communicated in both **human-readable** and **machine-actionable** manner in line with FAIR principles. So, their contributions to science become better prepared for a reality driven by AI technology.

Additionally, researchers can also employ the newly developed nanopublication-for-biodiversity workflow as **an annotation tool** to contribute to existing scientific output using the Citation Typing Ontology (CiTO).

Overall, nanopublications can also be used as a powerful **dissemination, communication and data exchange tool**.

Three uses of biodiversity nanopublications

1 Nanopublications associated with a manuscript submitted to the Biodiversity Data Journal.

This pilot workflow lets authors add a Nanopublications section within their manuscript while preparing their submission in the ARPHA Writing Tool (AWT). Here, authors ‘highlight’ and ‘export’ key points from their papers as nanopublications to further ensure the FAIRness of the most important findings from their publications.

2 Standalone nanopublication related to any scientific publication.

This can be done via the [Nanopublications](#) page accessible from the Biodiversity Data Journal. The main advantage of standalone nanopublication is that straightforward scientific statements become available and FAIR early on, and remain ready to be added to a future scholarly paper.

3 Nanopublications as annotations to existing scientific publications.

This feature is available on each article page in several journals published on the [ARPHA Platform](#). By attaching an annotation, a reader can contribute to, express an opinion about or otherwise evaluate any article using the [Citation Typing Ontology](#) (CiTO).

Examples of biodiversity nanopublications



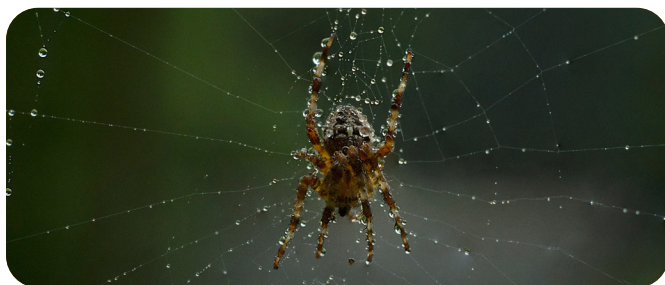
Wolves (*Canis lupus* Linnaeus, 1758) occur in forest habitats.



A grass snake (*Natrix natrix* Linnaeus, 1758) was observed to eat a tree frog (*Hyla arborea* (Linnaeus, 1758)).



Ursus meles Linnaeus, 1758 is a synonym of *Meles meles* (Linnaeus, 1758).



The nucleotide sequence GU682758 can be used to identify the species *Araneus diadematus* Clerck, 1757.

knowledge
pixels

