

# Identifying, Documenting and Digitizing Types: A Priority Program in Collections Management at MUSE - Science Museum of Trento (Italy)

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It is known that Type specimens are the most important specimens for taxonomy because the description of new species for science is based on them. Nevertheless, their management in natural history museums is not always adequate to their relevance. Curators and collections managers are often unable to determine with good precision how many and which type specimens are held in their collections. This is for several reasons: the fixation of name-bearing types and the statement of their holding collection became mandatory only with the last edition of the Zoological Code (International Code of Zoological Nomenclature (ICZN)) and remains only strictly recommended in the Botanical Code (International Code of Botanical Nomenclature (ICBN)); the study of historical material presents difficulties and uncertainties; taxonomists and collection professionals are often not sufficient to the amount of work required by such great task.

Among the 2 million specimens held in the MUSE - Science Museum of Trento natural history collections, spanning more than two centuries and mostly of local origin, we estimate that there are about 1,000 types. Many of them are connected to the collections of important botanists and micologists held in the Herbarium Tridentinum (TR) (Ambrosi, Gelmi, Porta, Bresadola); numerous others are amphibians and reptiles coming from the Eastern Arc Mountains (Tanzania) and other tropical African countries collected in the last 25 years; the number of insect and spider type specimens are also relevant. During a first survey held in 2019, 60% of the types results clearly identified; 10% are thoroughly catalogued, whilst only a few dozen of type specimens are digitized.

To fill this substantial gap in knowledge and follow the recommendations of the Botanical and Zoological Codes, MUSE undertook in 2019 a program for the identification, documentation and digitization of type specimens, that aims to allow full access to their data and to make them “open digital specimens”. The identified workflow steps are: 1) Identification: gathering of information from catalogues and publications written by scientists that collected and/or studied our collections; 2) Detailed cataloguing of specimens; 3) Digitization with pictures and/or 3D scanning models; 4) Care: checking environmental and safety conditions of storage location; 4) Publication: realization of types inventories and web open access to all associated documentation.