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Ecotaxonomy: Linking taxa with traits and integrating taxonomical and ecological research

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Abstract

Ecological roles of underexplored groups, such as tropical invertebrates, can be inferred from their functional traits, such as body mass, dispersal ability, reproductive mode and feeding habits. Despite a strong need, a common database for invertebrate traits is yet to be created. Traits are defined as a property of individual organisms, however many parameters are similar in groups of organisms, i.e., in species or even at higher taxonomic levels. Such parameters may be attributed to taxa instead of individuals. Linking both facilitates ecological and conservation studies based on taxa or phylogenetic units. Another problem hampering understanding of tropical ecosystems is the high proportion of undescribed species, particularly in soil communities. To estimate diversity, ecologists often have to operate with morphospecies instead of Linnean taxa. Morphospecies typically are defined independently in each project or even by each person, which does not allow consistent re-use.

Ecotaxonomy database (ecotaxonomy.org), implemented as an open platform, addresses these issues (Fig. 1). The taxonomic system of Ecotaxonomy is based on the Global Biodiversity Information Facility (GBIF) taxonomic backbone (gbif.org), which is being complemented with traits, pictures, literature and other parameters. Both common and group-specific traits and characters can be customized in the system. Each morphospecies has to be defined by a common grid of identification characters, which is being developed

in collaboration with group experts. Morphospecies then are incorporated into the existing GBIF taxonomic backbone and also inherit common characters and traits from the parental taxa. As an output the system provides open catalogs of traits and taxa, pictorial identification keys and trait matrixes. Further, by linking traits and taxa with individual-level and environmental data, Ecotaxonomy will be developed as a tool to push forward ecological research in underexplored groups and regions.
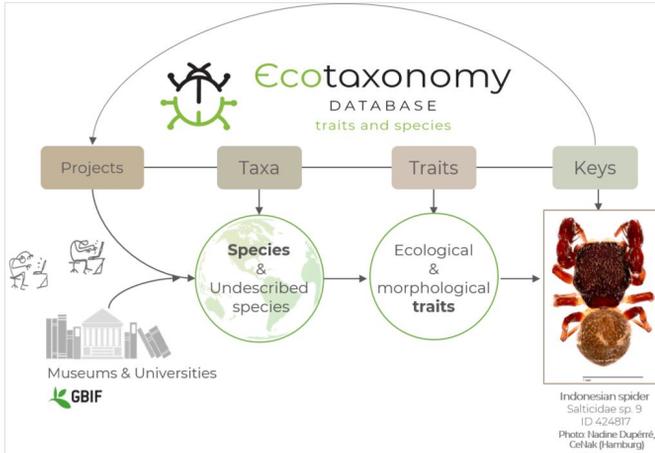

Figure 1.

Conceptual scheme of Ecotaxonomy workflow

Keywords

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