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TRY - Plant Traits for Earth System Science

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Plant functional traits are observable or measurable characteristics of plants that are assumed to reflect evolutionary responses to external conditions in the context of phylogenetic constraints. Information on a set of traits may therefore be a more objective characteristic of ecosystem dynamics and functioning than, for example, species identity or functional group classification. With sufficient information about the environment, plant traits provide a promising basis towards a more quantitative and predictive science in ecology. On the other hand plant traits are a heterogeneous group of data, scattered over numerous databases. Many of those databases are not easy available, which complicates integrated analyses.

We here report the birth of a community based effort, with currently more than 100 participants, to compile information about ecological traits of plant species at world scale and make these data available in a consistent format, based on mutual respect of intellectual property rights. This is a fast-track initiative, responding to urgent needs to produce generalities in the face of rapid environmental and biodiversity change, and inform future model development: putting functional diversity into Dynamic Global Vegetation Models (DGVMs). There will be no meaningful biogeochemical feedbacks in models without diversity. The effort has been named TRY, which is not an acronym - rather an expression of sentiment. TRY is an offspring of the IGBP initiative ‘Refining Plant Functional Classifications for Earth System Models’, and is now jointly headed by IGBP, DIVERSITAS, QUEST and the Max-Planck-Institute for Biogeochemistry. Organizers, data contributors and data users are spread widely through the research community.

The TRY database currently contains more than 2.4 million trait entries with a focus on 47 key traits. Due to its high number of entries, it allows for the first time data-based accounting of functional biodiversity within global vegetation models beyond the specification of few plant functional types. We will show some of the TRY first applications, contrasting the current parameterization of vegetation models with the observed trait variation across species, and demonstrating the enhanced potential to characterize the interplay between ecological strategy dimensions and physical environment.