

Data Papers

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A global database of paired leaf nitrogen and phosphorus concentrations of terrestrial plants

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Abstract. Nitrogen (N) and phosphorus (P) are essential components of the basic cell structure of plants. In particular, leaf N and P concentrations and their stoichiometric relationship largely determine the photosynthesis, growth, reproduction, and ecophysiological processes of plants. As important leaf functional traits, leaf N and P concentrations and their stoichiometric relationship play vital roles in indicating plant nutrient-use strategies and their evolution in terrestrial ecosystems. They also influence physiological and ecological processes in leaves (e.g., growth rate and energy metabolism) and productivity (e.g., net primary production and net ecosystem production) at ecosystem level. However, the lack of a comprehensive data set containing paired leaf N and P concentration records has distinctly limited research on nutrient stoichiometry and leaf functional traits. Here, we provide a global database of paired records of leaf N and P concentrations. A total of 11,354 individual records were acquired spanning 1,291 sites worldwide, including 201 families, 1,265 genera, and 3,227 species. The records span a latitudinal range of 45.28 °S to 68.35 °N and a longitudinal range of 155.5 °W to 168.0 °E. The variables provided for each individual record are (1) geographical location (longitude, latitude, and altitude); (2) matched leaf N and P concentrations and N:P ratio; (3) taxonomic information (family, genera, and species); (4) life form (angiosperm/gymnosperm, monocotyledonous/dicotyledonous and woody plants/herbaceous plants; note that woody plants were further divided into coniferous, deciduous broad-leaved, and evergreen broad-leaved woody species and that herbaceous plants were further divided into annual and perennial species); (5) mean annual temperature (MAT) and mean annual precipitation (MAP); and (6) soil N and P concentrations and pH value in some records. To date, this database is the world's largest database of paired leaf N and P concentrations, which contains matched information of geographical location, environmental factors, and taxa. We believe that the database will play a fundamental and crucial part of ecological stoichiometric studies. There are no copyright restrictions. When using this database, we kindly request that you cite this article, respecting all the authors' hard work during sample collection and data compilation.

Key words: leaf; nitrogen; N:P ratio; phosphorus; plant functional group; stoichiometry; scaling exponent; terrestrial plants.

The complete data sets corresponding to abstracts published in the Data Papers section in the journal are published electronically as Supporting Information in the online version of this article at <http://onlinelibrary.wiley.com/doi/10.1002/ecy.2812/supinfo>.

DATA AVAILABILITY

Associated data are also available at TRY-Plant Trait Database <https://www.try-db.org> under ID53 and ID181.

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