


DATA PAPER

Leaf architecture and functional traits for 122 species at the University of California Botanical Garden at Berkeley

Ilaine Silveira Matos^{1,2}  | Mickey Boakye¹ | Monica Antonio¹ |
 Sonoma Carlos¹ | Ashley Chu¹ | Miguel A. Duarte³ | Andrea Echevarria¹ |
 Adrian Fontao¹ | Lisa Garcia^{1,4} | LeeAnn Huang³ |
 Breanna Carrillo Johnson¹ | Shama Joshi³ | Diana Kalantar¹ |
 Srinivasan Madhavan¹ | Samantha McDonough¹ | Izzi Niewiadomski¹ |
 Nathan Nguyen³ | Hailey Jiyeon Park¹ | Caroline Pechuzal¹ | James Rohde¹ |
 Roshni Sahu¹ | Meg Scudder¹ | Satvik Sharma¹ | LeeDar Sneor¹ |
 Jason To¹ | Bradley Vu¹ | Natalie Vuong^{1,5} | Nicole Yokota¹ |
 Luiza M. T. Aparecido⁶ | Holly Forbes⁷ | Mark Fricker⁸ | Benjamin Blonder¹ 

¹Department of Environmental Science, Policy, and Management, University of California Berkeley, Berkeley, California, USA

²School of Biological Sciences, The University of Adelaide, Adelaide, South Australia, Australia

³School of Life Sciences, Arizona State University, Tempe, Arizona, USA

⁴Department of Biology, University of New Mexico, Albuquerque, New Mexico, USA

⁵Department of Biology, University of Waterloo, Waterloo, Ontario, Canada

⁶School of Biological Sciences, The University of Utah, Salt Lake City, Utah, USA

⁷University of California Botanical Garden, Berkeley, California, USA

⁸Department of Biology, University of Oxford, Oxford, UK

Correspondence

Ilaine Silveira Matos
 Email: ilaine.matos@gmail.com

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Abstract

The dataset contains leaf venation architecture and functional traits for a phylogenetically diverse set of 122 plant species (including ferns, basal angiosperms, monocots, basal eudicots, asterids, and rosids) collected from the living collections of the University of California Botanical Garden at Berkeley (37.87° N, 122.23° W; CA, USA) from February to September 2021. The sampled species originated from all continents, except Antarctica, and are distributed in different growth forms (aquatic, herb, climbing, tree, shrub). The functional dataset comprises 31 traits (mechanical, hydraulic, anatomical, physiological, economical, and chemical) and describes six main leaf functional axes (hydraulic conductance, resistance and resilience to damages caused by drought and herbivory, mechanical support, and construction cost). It also describes how architecture features vary across venation networks. Our trait dataset is suitable for (1) functional and architectural characterization of plant species; (2) identification of venation architecture-function trade-offs; (3) investigation of evolutionary trends in leaf venation networks; and

(4) mechanistic modeling of leaf function. Data are made available under the Open Data Commons Attribution License.

KEYWORDS

botanical garden, drought, ecology, functional traits, herbivory, leaf anatomy, leaf mechanics, leaf venation, plant ecophysiology, plant hydraulics, venation network

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available in Dryad at <https://doi.org/10.5061/dryad.1g1jwsv36>. Additional materials are provided in Zenodo as follows: venation trade-offs, <https://zenodo.org/doi/10.5281/zenodo.13733168>; leaf area, <https://zenodo.org/doi/10.5281/zenodo.13736231>; adaptive Convolutional Neural Networks, <https://zenodo.org/doi/10.5281/zenodo.13736233>.

ORCID

Ilaine Silveira Matos  <https://orcid.org/0000-0001-5557-5133>

Benjamin Blonder  <https://orcid.org/0000-0002-5061-2385>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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