

Ecology, 100(12), 2019, e02841

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Palm community transects and soil properties in western Amazonia

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Citation: Balslev, H., S. M. Kristiansen, and R. Muscarella. 2019. Palm community transects and soil properties in western Amazonia. *Ecology* 100(12):e02841. 10.1002/ecy.2841

Abstract. Western Amazonia is a global biodiversity hotspot that encompasses extensive variation in geologic, climatic, and biotic features. Palms (Arecaceae) are among the most diverse and iconic groups of plants in the region with more than 150 species that exhibit extraordinary variation of geographical distributions, regional abundance patterns, and life history strategies and growth forms, and provide myriad ecosystem services. Understanding the ecological and evolutionary drivers that underpin palm distribution and abundance patterns may shed light on the evolution and ecology of the tropical forest biomes more generally. Edaphic conditions, in particular, are increasingly recognized as critical drivers of tropical plant diversity and distributions but data deficiencies inhibit our understanding of plant–soil relationships at broad scales, especially in the tropics. We present data from 546, 0.25-ha (5 × 500 m) georeferenced transects located throughout western Amazonia where all individual palms were identified, counted, and assigned to a life-history stage. Several environmental covariates were recorded along each transect and surface soil samples were collected from multiple points in $N = 464$ of transects. Altogether, the transects include 532,602 individuals belonging to 135 species. Variation among transects in terms of palm species richness and abundance is associated with major habitat types and soil properties. The soil properties including pH, acidity, all macronutrients for all samples, and texture, carbon, nitrogen, and micronutrients for some transects vary substantially across the study area, providing insight to broad-scale variation of tropical surface soils. The data provided here will help advance our understanding of plant distributions and abundance patterns, and associations with soil conditions. No copyright restrictions are associated with this data set but please cite this paper if data are used for publication.

Key words: abundance; Arecaceae; diversity; edaphic gradients; exchangeable bases; Neotropics; rain forest; soil phosphorus; tropical soils.

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.2841/supinfo>.

Manuscript received 26 April 2019; revised 18 June 2019; accepted 25 June 2019. Corresponding Editor: William K. Michener.

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