

A signal of competitive dominance in mid-latitude herbaceous plant communities

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Abstract

Understanding the main determinants of species coexistence across space and time is a central question in ecology. However, ecologists still know little of the scales and conditions at which biotic interactions matter and how these interact with the environment to structure species assemblages. Here we use recent theoretical developments to analyze plant distribution and trait data across Europe and find that plant height clustering is related to both evapotranspiration and gross primary productivity. This clustering is a signal of interspecies competition between plants, which is most evident in mid-latitude ecoregions, where conditions for growth (reflected in actual evapotranspiration rates and gross primary productivities) are optimal. Away from this optimum, climate severity likely overrides the effect of competition, or other interactions become increasingly important. Our approach bridges the gap between modern coexistence theory and large-scale species distribution data analysis.

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