TITLE	**PHOTOSYNTHETIC RESPONSES TO TEMPERATURE ACROSS THE TROPICS: A META-ANALYTIC APPROACH**
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ABSTRACT	• Background and Aims Tropical forests exchange more carbon dioxide (CO_2) with the atmosphere than any other terrestrial biome. Yet, uncertainty in the projected carbon balance over the next century is roughly three times greater for the tropics than other for ecosystems. Our limited knowledge of tropical plant physiological responses, including photosynthetic, to climate change is a substantial source of uncertainty in our ability to forecast the global terrestrial carbon sink. • Methods We used a meta-analytic approach, focusing on tropical photosynthetic temperature responses, to address this knowledge gap. Our dataset, gleaned from 18 independent studies, included leaf-level light-saturated photosynthetic (A_{sat}) temperature responses from 108 woody species, with additional temperature parameters (35 species) and rates (250 species) of both maximum rates of electron transport (J_{max}) and Rubisco carboxylation (V_{cmax}). We investigated how these parameters responded to mean annual temperature (MAT), temperature variability, aridity and elevation, as well as also how responses differed among successional strategy, leaf habit and light environment. • Key Results Optimum temperatures for A_{sat} (T_{optA}) and J_{max} (T_{optJ}) increased with MAT but not for V_{cmax} (T_{optV}). Although photosynthetic rates were higher for ‘light’ than ‘shaded’ leaves, light conditions did not generate differences in temperature response parameters. T_{optA} did not differ with successional strategy, but early successional species had ~4 °C wider thermal niches than mid/late species. Semi-deciduous species had ~1 °C higher T_{optA} than broadleaf evergreen species. Most global modelling efforts consider all tropical forests as a single

	‘broadleaf evergreen’ functional type, but our data show that tropical species with different leaf habits display distinct temperature responses that should be included in modelling efforts. • Conclusions This novel research will inform modelling efforts to quantify tropical ecosystem carbon cycling and provide more accurate representations of how these key ecosystems will respond to altered temperature patterns in the face of climate warming.
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