TITLE	**ONLY SUN-LIT LEAVES OF THE UPPERMOST CANOPY EXCEED BOTH AIR TEMPERATURE AND PHOTOSYNTHETIC THERMAL OPTIMA IN A WET TROPICAL FOREST**
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ABSTRACT	Tropical forests have evolved under relatively narrow temperature regimes, and therefore may be more susceptible to climatic change than forests in higher latitudes. Recent evidence shows that lowland tropical forest canopies may already be exceeding thermal maxima for photosynthesis. Height can strongly influence both the microclimate and physiology of forest canopy foliage, yet vertical trends in canopy micrometeorology are rarely examined in tropical forests. To improve our understanding of how climatological and micrometeorological conditions affect tropical tree function, we assessed vertical gradients of photosynthetic photon flux density, vapor pressure deficit, air temperature, leaf temperature, and the difference between leaf and air temperature (ΔT) in a Puerto Rican tropical wet forest. Both air temperature and vapor pressure deficit increased linearly with height. Leaf temperature, however, did not significantly differ across the shaded foliage from 0-16 m, while the uppermost layer (20 m) was up to 4°C hotter than the rest of the foliage and up to 5°C hotter than air temperature at the highest radiation intensity. As a result, leaf temperatures in the shaded middle canopy and understory showed nearly poikilothermic behavior (i.e., leaf temperatures = air temperature), while the uppermost canopy strata showed megathermic behavior (i.e., leaf temperatures greater than air temperature), revealing different thermoregulation strategies for sun-lit versus shaded foliage. In addition, the uppermost canopy was the only stratum to exceed mean photosynthetic temperature optima for this site (Topt = 30.2 ± 1.1°C). Because the upper canopy plays a disproportionately large role in whole-forest photosynthesis, continued warming could potentially weaken the tropics' carbon sink capacity. However, the shaded leaves may be able increase carbon

	uptake with further warming because they appear to be able to maintain temperatures below photosynthetic optima, possibly with the help of radiation shielding provided by the uppermost canopy layer.
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