



How valid are the assumptions of popular interception models?

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Popular interception models assume 1) that canopy water storage capacity is a static quantity, 2) that the canopy starts to drain only after this storage capacity is filled, and 3) that therefore any rain that passes the canopy before saturation must be 'free throughfall'. There are several reasons to believe that water can drip from the canopy before saturation occurs, such as changing meteorological conditions, like wind or rain intensity, during the wetting-up phase or non-uniform surface characteristics of canopy materials, like hydrophilic vs. hydrophobic leaf surfaces.

Many years of field observations led us to believe that canopy drip may start at the same time as gross precipitation. To investigate this hypothesis we collected, for 102 rain events, high-resolution rainfall and throughfall data from two even-aged monoculture stands of *Pachira quinata* (Malvaceae) and *Anacardium excelsum* (Anacardiaceae) in central Panama, as well as canopy and leaf traits of these species.

Canopy drip from the onset of a rain event began much earlier in *P. quinata*, which has leaves with a waxy surface and no hairs, than in *A. excelsum*, with hairs on its leaf surfaces. Simple measurements of hydrophobicity demonstrate that the surfaces of *P. quinata* leaves are less hydrophilic than the surfaces of *A. excelsum* leaves. *P. quinata* leaves also have an oblong drip tip on the tip of their lamina, whereas *A. excelsum* leaves have a rounded apex. Furthermore, the leaf toughness of mature leaves of *P. quinata* is lower than the leaf toughness of mature leaves of *A. excelsum*. Therefore *P. quinata* leaves are more likely to bend with incoming raindrops, channelling rainwater to the ground. These leaf characteristics are consistent with the results from the high-resolution throughfall data collected from rain events. Thus confirming that canopy traits affect the accumulation of net-precipitation. A preliminary regression analysis of relative throughfall against gross precipitation suggests differences in canopy capacity, as computed according to Leyton et al. (1967) for the two tree species. In our presentation, we will also look at the effect of leaf properties on the free throughfall coefficient.