Photosynthetic rates of four tree species in the upper canopy of a tropical rain forest at the Pasoh Forest Reserve in Peninsular Malaysia

ABSTRACT

Measurements of photosynthesis (A) and stomatal conductance (gs) were conducted using the leaves of four tropical tree species (Dipterocarpus sublamellatus, Neobalanocarpus heimii, Ptychopyxis caput-medusae, and Xanthophyllum amoneum) in the canopy of the lowland forest at the Pasoh Forest Reserve in peninsular Malaysia. A canopy walkway was used to reach the canopy of 30- to 40-m-tall trees and diurnal changes in A and gs were determined. The diurnal patterns for A differed between days and between species, though A of the four species were similar but quite low. In general, A increased with increasing photosynthetically active radiation (PAR) before noon, then declined. As well, a linear relationship was detected between gs and A, but no statistically significant correlation could be confirmed between these two factors for D. sublamellatus and P. caput-medusae in November and July. The value of gs decreased with increasing vapor pressure deficit for D. sublamellatus, but the other species did not show this response.

Keyword: Canopy; Diurnal changes; Tropical forest; Photosynthesis; Stomatal conductance