STOMATAL CONDUCTANCE ON UNDERSTOREY VEGETATION OF AN EASTERN AMAZON FOREST[22]

Tatiana Deane de Abreu Sá[23, 24], José de Paulo R. da Costa[25] & John M. Roberts[26]

In order to assess the stomatal response of understorey vegetation to environmental variables, and its potential contribution to the overall forest water vapour exchange, stomatal conductance (g_s) was measured at 1-2 hourly intervals on 20 days, during 11 periods throughout 15 months, in a "terra firme" forest near Marabá, Southeastern Amazônia, Brazil. Within each period, g_s was measured on leaves of 5 to 10 individuals for each of the 4 studied understorey vegetation species (*Rinorea passoura*, *Duguetia flagellaris*, *Paragonia piramidata*, and *Astrocaryum mumbaca*) using a dynamic diffusion porometer (model AP4, Delta-T Devices). *D. flagellaris* was by far the most frequent species found in this understorey vegetation. Simultaneous measurements of photosynthetic photon flux density (**Q**) were made with a quantum sensor attached to the porometer chamber. Hourly measurements of meteorological variables were made above the forest canopy (52m height) throughout the observation periods. Weekly soil moisture content data (upper 1m to 2m layers of soil) were also available. An analysis of the relationship between g_s and these environmental variables is presented. No significant relationship was found between g_s and **Q**, in all four species. The relationship between g_s and the meteorological variables above the canopy exhibited a seasonal pattern, more likely reflecting changes in soil water storage. A marked dependence of g_s on soil surface moisture was observed in leaves of all studied species, specially in *A. mumbaca*, an amphistomatous palm. Under high soil moisture content levels, during January and April, this palm showed g_s values similar to those found in upper canopy leaves of the same forest, reaching g_{smax} values higher than 500 mmol m^{-2} s^{-1}. The most common species, the shrub *D. flagellaris* although showing a significant relationship between g_s and top soil moisture storage, had relatively low g_s values (overall g_{smax} < 200 mmol m^{-2} s^{-1}). The results suggest that if the understorey vegetation composition changes towards a reduced frequency of species such as *D. flagellaris* and/or increasing the concentration of species like *A. mumbaca*, substantial changes may occur in the relative contribution of understorey vegetation to the forest water vapour exchange.

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[23] EMBRAPA/CPATU, C. Postal 48, 66095-100, Belém, PA fax (091)226-9845, e-mail: tatiana@nautilus.com.br

[24] NEAF, UFPA

[25] Department of Meteorology, UFPA

[26] Institute of Hydrology, Wallingford, UK