

Xylem water conductance of 5 year old *Swietenia macrophylla*, *Carapa guianensis*, *Cedrela odorata*, *Dipteryx odorata* and *Hymenaea courbaril**

O. Dünisch, M. Erbreich, Institute for Wood Biology, Hamburg University

L. Gasparotto, CPAA/EMBRAPA, Manaus

G. Schroth, Institute of Applied Botany, Hamburg University

The water supply of the Manaus region is characterized by a seasonal variation of the precipitation and the soil water content, which has a strong influence on the growth dynamics of the vegetation. Therefore the xylem water conductance of 5 native commercial timber trees of the Central Amazon (*Swietenia macrophylla*, *Carapa guianensis*, *Cedrela odorata*, *Dipteryx odorata*, *Hymenaea courbaril*) was studied as to get some informations on the influence of wet and dry periods on the water uptake and water transport of these species. The water conducting system of the trees was studied in terms of wood anatomical parameters (vessel size, vessel area, pits), the water content of the xylem and the lifecycle of leaves and roots. As to mark the water conducting xylem, methylenblue (1:100) was used as a tracer. Xylem flux measurements were carried out by means of calibrated Granier-method with an accuracy of +/-10%. These data were correlated with precipitation and the suction force of the soil as to study the relationship between the water supply and the xylem water conductance of the trees. The tracer experiments indicated that for all species the vessel system was of main importance for the water transport in the stem. The mean vessel diameter of *Swietenia*, *Carapa*, *Cedrela* and *Hymenaea* varied between 120 and 170µm, whereas the mean vessel diameter of *Dipteryx* varied between 60 and 80µm, which indicates a high efficiency of the stem xylem for water transport of *Swietenia*, *Carapa*, *Cedrela* and *Hymenaea* compared to *Dipteryx*. Corresponding to that xylem flux measurements showed a strong increase of the water uptake of *Swietenia*, *Carapa*, *Cedrela* and *Hymenaea* at the beginning of the wet season with maximum values for *Cedrela*. The water conducting area of the stem of *Swietenia*, *Carapa*, *Cedrela* and *Hymenaea* was strongly reduced during the dry season, which was correlated with a slight decrease of the xylem water content. A strong correlation was found between the seasonal variation of the suction force of the soil, the xylem conduction area of the stem and the intraannual growth dynamics of the trees (litterfall, budbreak, cambial activity). From these data it was concluded that the decrease of the water conducting area of *Swietenia*, *Carapa*, *Cedrela* and *Hymenaea* during the dry season is not caused by air embolism, but by reversible seasonal alterations of the water conducting continuum root-stem-leaf (These investigations are carried out in ENV 42 in cooperation with EN 23).

*Financial support by the CNPq/IBAMA, Brasilia and the BMBF Bonn within the Brazilian-German cooperation program „SHIFT“ (ENV 42/0339638).