



Nutrient fluxes in throughfall and stemflow in forest Cerrado species

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Although recognized as a hotspot, being one of the most diverse biomes in Brazil and responsible for recharging the main aquifers in South America, the Cerrado has been suffering from intense deforestation. Since rainfall, after reaching the forest canopy, has its physicochemical features altered by the metabolites leaching from the leaves tissues, branches, and stem, this study was developed in order to obtain information about the hydrological processes in the biome and the potential of nutrient input by their forest species. There is a lack of studies as proposed in natural environments such as Cerrado. Based on this, we have evaluated the relative importance of stemflow and throughfall solute concentrations to the soil surface in a Cerrado forest in Brazil and also the potential of stemflow by 8 Cerrado species to soil nutrient input. The following chemical aspects from rainfall, throughfall and stemflow were determined: Na²⁺, K⁺, hardness (Ca²⁺ and Mg²⁺), Cl⁻, PO³⁻ and on a liquid chromatograph Metrohm ECO IC during august to december 2018. The comparison between mean concentration, showed that most of the elements and compounds were more concentrated in throughfall and stemflow, except for Na²⁺ and Ca²⁺, which were more concentrated in rainfall (p <0.05). While the amount of stemflow channeled to the tree trunks comprised approximately 4% of rainfall, some nutrients in stemflow were enriched up to 10-fold in comparison to throughfall and rainfall. When we have discriminated the solute concentration by stemflow between 8 forest species from Cerrado, we have noted that each species has a specific contribution to the stemflow nutrient and for most of the species, the ion concentrations in the stemflow water is higher than those found in the rainfall and throughfall. *Xylopia aromatica* has shown the major difference between the solute concentrations when compared within other species. The total input of nutrients fluxes, as the amount of rainfall loading had been ranked as follows: K⁺ > Ca²⁺ > Mg²⁺ > NO₃ > > Cl⁻ > Br⁻. The highest nutrient input by stemflow was for K⁺, which ranged from 7.91 (*H. ochraceus*) to 114.08 (*X. aromatica*) kg ha⁻¹. These results highlight the importance of investigating the individual contribution of each species in the stemflow in Cerrado forest, suggesting a variety in nutrient input through the biogeochemical cycle and could be a strategy to accommodate the species for soil recovering. The knowledge of the biogeochemical dynamic helps to understand the processes that are responsible for the sustainability of forest ecosystems and the forest ecosystem plays an important role in water balance, not only in terms

of water quantity (volume) but also in the distribution of the chemical elements.