



STEMFLOW GENERATION BY SEVEN URBAN TREE SPECIES WITH REFERENCE TO RAINFALL AND RAINFALL INTENSITY IN UNIVERSITY OF SRI JAYEWARDENEPURA, SRI LANKA

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Abstract

Stemflow (SF) is the process in which a portion of incident rainfall (RF) entrained by canopy and flowed down to trunks and stems. The SF generation of urban environment in single rain events are less frequently reported than in forested ecosystem. Therefore, SF variation was studied in the urban environment with reference to RF and RF intensity. The SF of 21 individual trees (belonging to 7 species with 3 replicates) located in University of Sri Jayewardenepura, Sri Lanka were studied by installing SF collars at diameter at breast height (DBH) and connected to storage tanks. The SF was measured for 20 number of rain events starting with dry canopy condition from August 2019 to November 2019. Gross precipitation was recorded using an automated weather station located in an open area in University premises. Relationships were built up with SF and RF, RF intensity. It was found that the all plant species have produced SF for all rain events greater than 4 mm. A strong positive relationship ($p < 0.00$; $R^2 = 0.99$) was resulted between SF and RF for all studied plant species. The highest (50.14%) and the lowest (0.89%) SF were generated by *Felicium decipiens* and *Pterocarpus marsupium* Roxburgh species. The RF intensity was not significantly influenced for SF generation for the all studied 7 plant species since this study was done under low RF intensity. The results suggest a significant variation in SF by species and the arrangement could be made as *Felicium decipiens* > *Mesua ferrea* L > *Dipterocarpus zelanicus* Thwaites > *Delonix regia* (Boj. Ex Hook.) Raf. > *Azodrachata indica* > *Casuarina eqisetifolia* L > *Pterocarpus marsupium* Roxburgh based on species specific SF and the result can use to selection of urban tree species towards integrated rainwater management in cities.

Keywords: Rainfall, rainfall intensity, stemflow, storm water management, urban forestry