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A Baseline Study to Identify Efficient Plant Species Used for Roadside Green Facades in Urban Areas Based on Qualitative Judgment

Samarasekara G.N.^{1*}, Madushanka W.M.S.²

¹*Faculty of Engineering, University of Sri Jayewardenepura, Ratmalana, Sri Lanka*

²*University of Ruhuna, Sri Lanka*

**gargas@sjp.ac.lk*

Abstract

Greenery in road facades and building facades contribute to create thermal comfort while purifying the air. Thermal comfort around greenery results from Evapotranspirative cooling. While there are many plant specific air purification mechanisms, photosynthesis is the main air purification mechanism that converts CO₂ in to O₂. The decisions on greening towards more comfortable environment should essentially include selection of species higher evapotranspiration properties and higher photosynthesis rates. This research aims to identify species with higher transpiration and CO₂ absorbance properties among most frequently used plant species in the Western Province, Sri Lanka. A pool consisting of 35 plants species was created by a roadside survey done in the three districts of Western Province, Sri Lanka. These plants were then rated by an expert judgement for their air purification and thermal comfort creation performance using three plant factors namely, leaf area, leaf structure and stomatal movement using a subjective scale. From the outcomes a set of plant species were identified which have higher performance for thermal performance and air purification. Result of this research can be used for selection of most suitable plant species for green facades which having higher transpiration properties. It is expected to verify the results through an experimental verification.

Keywords: Air purification, Evapotranspiration, Green facade, Species, Thermal comfort