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Evaluation of tropical climbers to mitigate urban heat island effect

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Green Infrastructure (GI) offers thermal regulation to mitigate the urban heat island effect (UHIE). GIs could be strategically placed in relation to buildings to maximise benefits. Previous studies confirmed certain morphological characteristics of plants as best to mitigate the UHIE. Among plants utilized in GI in urban spaces, climbers are an understudied group with great potential. Apart from aesthetic appeal, climbers grow rapidly and require minimal space, making them a valuable multifunctional resource for urban spaces. With this backdrop, we assess selected morphological characters of eighteen climbers to recommend the best plants to mitigate the UHIE. Four individuals were randomly selected per species, and three mature twigs (25 cm) per individual were used to measure twelve morphological characters that directly and indirectly contributed to reducing UHIE. The data were subjected to ANOVA, using R Studio. *Petrea volubilis*, *Combretum indicum* and *Allamanda cathartica* recorded significantly high ($P < 0.05$) leaf area, number of leaves in unit length and stomatal density. High leaf area, together with more leaves per unit length, increases shading, thereby reducing the absorption of solar radiation by surfaces. High stomatal density increases the evapotranspiration rate, which cools the surrounding environment by absorbing heat energy from the leaf surface and surrounding air. Moisture released from evapotranspiration also reduces the surface heat-up rate. Significantly high leaf thickness in *P. volubilis* and *C. indicum* provides better insulation while shorter petioles in *A. cathartica* and *C. indicum* provide dense cover. Hence, we recommend the above three climbers as they possess a majority of contributing characteristics to mitigate UHIE. Accordingly, we propose to consider plant morphology as a criterion in the selection of climbers when establishing GI in urban spaces to increase human thermal comfort.

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