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PRELIMINARY ASSESSMENT OF CLIMBERS FOR ENHANCING URBAN ACOUSTIC COMFORT

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Anthropogenic noise has become a significant concern for urban dwellers, primarily caused by road traffic, industrial activities, construction sites, and social activities, which affect human wellbeing. Vegetation with desirable morphological characters can mitigate noise through absorption, scattering, reflection, and ground effect. Climbers, a largely understudied plant group, show potential for noise attenuation when used in urban green infrastructure. This study analysed the quantitative and qualitative morphological traits of 19 climber species to assess their potential for noise reduction. Three randomly selected individuals per species were examined, and 12 morphological traits were measured from three mature twigs (30 cm) of each climber. Quantitative data was analysed using ANOVA in R Studio. Leaf area, leaf thickness, and hair density emerged as the primary traits associated with noise reduction, while hair length, petiole length, leaf margin shape, presence of hairs on the midrib and petiole, and surface texture were secondary factors. *Petrea volubilis*, *Thunbergia grandiflora*, and *Antigonon leptopus* exhibited significantly greater ($p < 0.05$) leaf area, leaf thickness, and hair density on both surfaces compared to other species. Leaf area ranged from 85.04 cm² to 1203.32 cm², thickness from 34.77 µm to 79.70 µm, and hair density from 1 – 198 (upper) and 2 – 246 (lower), as observed at ×100 magnification under a scanning electron microscope. Higher leaf area and hair density likely provide a greater surface for noise absorption, while thicker leaves may reduce transmission. Longer hairs in *P. volubilis* and *T. grandiflora* further enhanced surface area. Non-entire leaf margins, hairs on the midrib and petiole, and rough textures also contributed to noise absorption, while longer petioles of *T. grandiflora* and *A. leptopus* may promote leaf movement. Therefore, these three species may be considered for use in urban greening initiatives, as they could contribute to improving the acoustic comfort of city dwellers.

Keywords: Climbers, Green infrastructure, Morphological characters, Noise reduction, Urban areas