

Sound absorption characteristics of two selected fruit plants, *Anacardium occidentale* (cashew) and *Mangifera indica* (mango), measured by reverberation room method

Nilmini K.A.C.³, Amarasingha N. D.^{1*}, Guruge R.S.P.¹, Sandaruwan U.A.T.¹, Sooriyaarachchi S.A.S.N.¹, Bodhika J.A.P.¹, Dharmaratna W.G.D.¹ and Jayatissa L.P.²

¹*Department of Physics, University of Ruhuna, Matara, Sri Lanka*

²*Department of Botany, University of Ruhuna, Matara, Sri Lanka*

³*Department of Physics, Faculty of Natural Sciences, The Open University of Sri Lanka*

Sound absorption barriers made of plants are used as an environmentally friendly solution to reduce noise pollution. In cities of Sri Lanka, noise pollution is one of the major problems that needs attention. This paper compares noise absorption power of two fruit plants, *Anacardium occidentale* (cashew) and *Mangifera indica* (mango), measured by 'reverberation room method'. The preliminary result presented here is part of an attempt to identify locally available plants as sound barriers. A reverberation room, with appropriate dimensions and diffusers to satisfy the ISO 354:2003 standard with uniform sound distribution in the working area, was designed and constructed to perform the experiment. B&K type 2250L hand-held analyzer, Dodecahedron Omni Directional B&K speaker, internal sound generator with B&K power amplifier and A16 Mega Pixel camera were the main equipment used. Plant holder with dimensions 2.4 x 2.4 m² was placed in the middle of the reverberation room to hang the testing plant samples. Speaker and the analyzer were placed at appropriate locations keeping 1m away from the sample and 1m above the ground. Special care was taken to keep plant samples alive during the process. Reverberation Time (RT₃₀) was measured using reverberation room method. Thirty (30) measurements were taken for each plant sample, at three different locations of the analyzer, repeating 10 times at each location. The procedure was repeated for three different samples of each plant type. Sound Absorption Coefficient (α) was calculated using Sabine's formula. Variations of RT₃₀ and α with frequency were plotted. RT₃₀ decreases and α increases with the increase of frequency for both samples. *M. indica* (mango) had lower RT and higher α than *A. occidentale*(cashew) in the frequency range (1000-3150 Hz) studied. At 2500 Hz, α of *M. indica* ($\alpha = 0.295$) is 28.8% higher than that of *A. occidentale* ($\alpha = 0.229$) indicating mango plants are better than cashew plants for noise absorption. Further studies are in progress to study other plant types.

Keywords: Sound Barriers, Reverberation time, Reverberation room, Sound absorption coefficient

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*Corresponding Author: andhanushka31@gmail.com