ISSN: 1391-8796
Proceedings of 7th Ruhuna International Science & Technology Conference
University of Ruhuna, Matara, Sri Lanka
January 22, 2020

Investigation of sound absorption properties of selected fruit plants

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Four selected fruit plants, *Flacourtia inermis* (fලdú), *Achras sapota* (සැප†ල්ලා), *Averrhoa carambola* (කාමරංකා), *Syzygium jambos* (ජාඹු), were studied for their sound absorption properties. Reverberation room method described under ASTM (American Society for Testing and Material) ISO 345 standard was followed throughout the experiment. B&K type 2250L handheld sound analyzer, Dodecahedron Omni Directional B&K speaker and an internal sound generator with a B&K Power amplifier were the major equipment used. Especially manufactured steel frames (1.2 m x 1.2 m) were used as plant holders. Measurements were repeated for three locations in the room and for each location ten measurements were taken. The time required to drop the sound level by 30dB, which is the reverberation time RT30, was measured in the room with and without the sample. The standard reverberation time RT60 was obtained by doubling the RT30 values. The sound absorption coefficient (SAC) for a unit volume of each plant type was calculated. The Sabine's formula was modified to calculate SAC. The study was performed in the sound frequency range 1.0–3.15 kHz.
The plant *Flacourtia inermis* shows significantly high SAC, increasing from 0.19 at 1.0 kHz up to 0.47 at 2.5 kHz and 0.39 at 3.15 kHz. The second-best type, *Syzygium jambos*, has SAC of 2.35 times lower at 2.5 kHz than that of *Flacourtia inermis*. Therefore, *Flacourtia inermis* plant could be used for noise screening.

Keywords: fruit plants, noise screens, reverberation room and sound absorption coefficient

Acknowledgements: UGC block grant RU/PG-R/16/12 is acknowledged.

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