

instrument such as balafon and wood block, or as a material for constructing musical instrument such as the talking drum.

With the value of harmonic of sound from *G.arborea* wood at mid-point, it cannot be concluded whether the wood species is suitable as musical instrument or not. since this study is preliminary, it thus suggest a further study into other wood species so as to enable us determine a standard value of sound harmonic with which a wood sample will certify good for acoustic purposes in relation to its timbre harmonic. Notwithstanding, other indices of acoustic is also essential if a wood is to be recommended for acoustic purposes.

Table 1: Timbre harmonics of sound of *G. arborea* wood with respect to number of observation

	Number of Observation				
	3	4	5	6	7
Replicate 1	0.12	0.49	0.42	0.53	0.8
Replicate 2	0.16	0.6	0.56	0.67	0.79
Replicate 3	0.1	0.25	0.46	0.64	0.36
MEAN	0.13	0.45	0.48	0.61	0.65

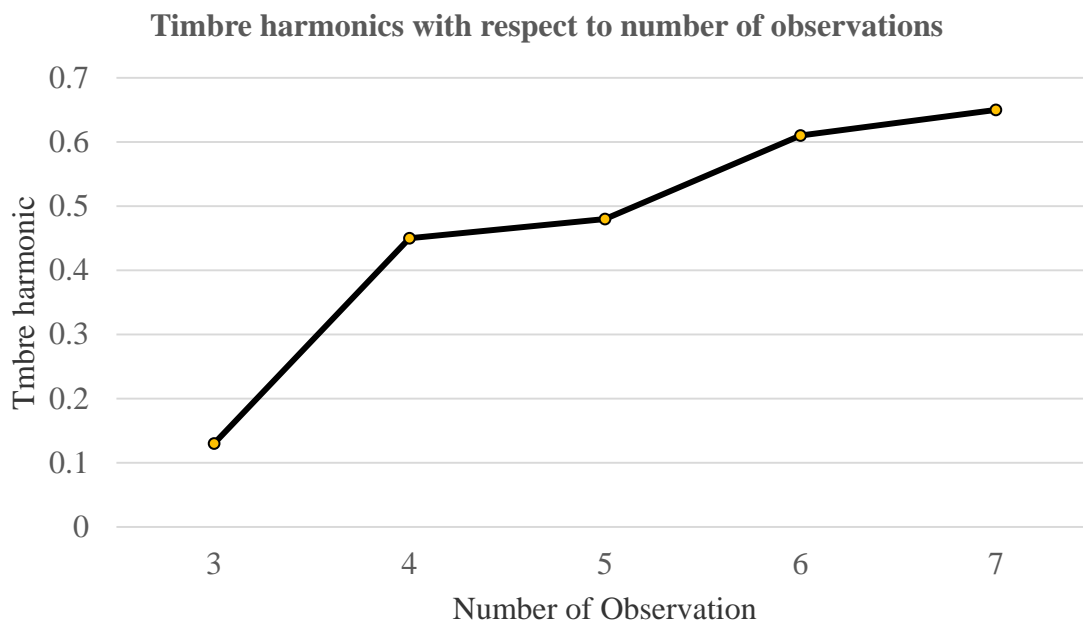


Fig 2: Trend of timbre harmonics with respect to number of observations

Table 2: Analysis of variance (ANOVA) for Number of observations of timbre harmonic

Source	Sum of Squares	df	Mean Square	F	P-Value
No. of observations	0.51	4	0.13	6.02	0.01*
Error	0.21	10	0.02		
Total	3.95	15			

* - significant at $P \leq 0.05$

ns – not significant

Table 3: Post-hoc test for ANOVA for Number of observations of timbre harmonic

No. of Observation	N	Subset	
		1	2
3	3	0.13	
4	3		0.45
5	3		0.48
6	3		0.61
7	3		0.65
Sig.		1.000	0.14

Table 4: Timbre harmonics summary of sound of *G.arborea* wood

	Top wood	Base wood	Mean
Inner wood	0.49	0.57	0.53
Outer wood	0.41	0.53	0.47
Mean	0.45	0.55	0.50

Table 5: Analysis of Variance of timbre harmonics of sound of *G.arborea* wood

S/V	Sum of Squares	df	Mean Square	F	P-Value
axial	0.03	1	0.03	1.15	0.32 ns
radial	0.01	1	0.01	0.34	0.57 ns
axial * radial	0.00	1	0.00	0.03	0.87 ns
Error	0.22	8	0.03		
Total	3.29	12			

* - significant at $P \leq 0.05$

ns – not significant

CONCLUSION AND RECOMMENDATION

This study has successfully design a harmonic model which was assessed on *G.arborea* wood, and it was considered suitable for determining the harmonicity of a timbre of sound. meanwhile, it was as well observed to be suitable for use for musical instruments such as piano, guitar, talking drum etc. from the afore-mentioned, this model is therefore recommended for determine harmonic of sound of wood and other musical instruments.

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