

## Validation of the X-Ray Densitometry Method for Radial Density Pattern Determination of Acacia seyal var. seyal Tree Species

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**Abstract :** Wood density is a variable influencing many of the technological and quality properties of wood. Understanding the pattern of wood density radial variation is important for its end-use. The X-ray technique, traditionally applied to softwood species to assess the wood quality properties, due to its simple and relatively uniform wood structure. On the other hand, very limited information is available about the validation of using this technique for hardwood species. The suitability of using the X-ray technique for the determination of hardwood density has a special significance in countries like Sudan, where only a few timbers are well known. This will not only save the time consumed by using the traditional methods, but it will also enhance the investigations of the great number of the lesser known species, the thing which will fill the huge gap of lack of information of hardwood species growing in Sudan. The current study aimed to evaluate the validation of using the X-ray densitometry technique to determine the radial variation of wood density of Acacia seyal var. seyal. To this, a total of thirty trees were collected randomly from four states in Sudan. The wood density radial trend was determined using the basic density as well as density obtained by the X-ray densitometry method in order to assess the validation of X-ray technique in wood density radial variation determination. The results showed that the pattern of radial trend of density obtained by X-ray technique is very similar to that achieved by basic density. These results confirmed the validation of using the X-ray technique for Acacia seyal var. seyal density radial trend determination. It also promotes the suitability of using this method in other hardwood species.

**Keywords :** x-ray densitometry, wood density, Acacia seyal var. seyal, radial variation

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