

Effectiveness of wood coating and preservative treatment on *Melia dubia* surface characteristics

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INTRODUCTION & AIM

Wood is the most essential, adaptable, and sustainable construction material. The wood and its derived products are commonly used in various outdoor and indoor spaces due to their availability and flexibility. As a naturally occurring organic material, it is prone to decay, fungal staining, insect infestations, and fire susceptibility, all of which greatly reduce the lifespan of a building. Consequently, when used in home construction needs to be treated with preservatives. Therefore for protection of wood against these aspects wood treatment and wood finishing becomes obligatory.

The purpose of this research was to investigate the effects of preservatives and surface finishes on the surface characteristics of *Melia dubia*. This study has two primary goals. The first is to analyze the efficacy of the two preservatives, ZiBOC and BBA, while the second goal is to evaluate how both the preservatives and finishes affect gloss and thickness measurements.

MATERIAL AND METHOD

- **Material used:** Specimen size of 6 x 3 x 0.5 cubic inch were prepared from sawn wood of *Melia dubia*.
- **Treatment Process:** The wooden samples were impregnated with 4% ZiBOC and 4% BBA. After the impregnation the treated specimens were allowed to dry till the moisture content reaches 12-15%.
- **Surface coating process:** The dried samples were evenly sanded using sandpaper with grit sizes 60, 80, 100, and 120 in a sequential fashion. The three varieties of commercial polishes were applied to the surfaces using a brush. Three sets were created, with each set including six samples, classified as A, B, and C. The samples in Group A received a treatment of wax polish, the second group was treated with PU polish, and the third group was applied with spirit shellac. The polishes were applied until an appropriate shine was achieved on the wood's surface, which helps in evaluating the gloss and thickness values.
- **Measurement of gloss:** Gloss assessments were performed at a 60-degree angle using Trio micro gloss equipment manufactured by Sheen Instruments as shown in Figure 1.



Figure 1: Gloss meter

- **Thickness measurements:** The thickness of the samples is assessed utilizing a thickness gauge. A gel-like material is introduced to the samples by distributing several drops in a uniform pattern, as illustrated in Figure 2.



Figure 2: Thickness meter

RESULTS & DISCUSSION

In this study, *Melia dubia* samples treated with preservatives and wood coatings, such as wax, PU, or spirit shellac, showed an increase in gloss values and thickness values as compared to untreated wood.

Among the preservatives ZiBOC showed good results when compared with BBA. With coated surfaces. Moreover ZiBOC preservative with wax showed less gloss and thickness values, then along with spirit shellac and followed by Polyurethane finish.

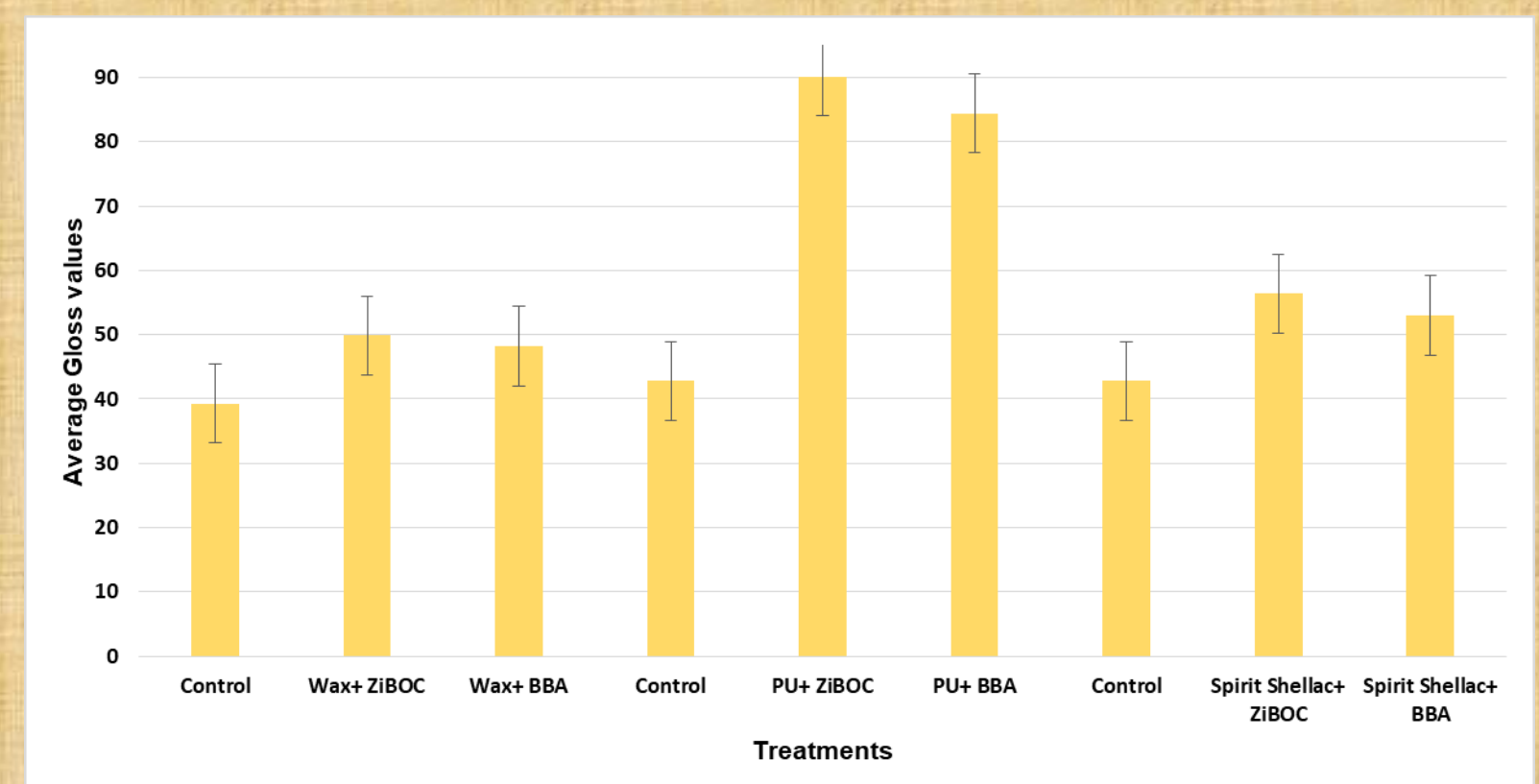


Figure 3: Average gloss (Gloss Unit) values of preservative treated and control samples of *Melia dubia* treated with wax, PU and spirit shellac polish.

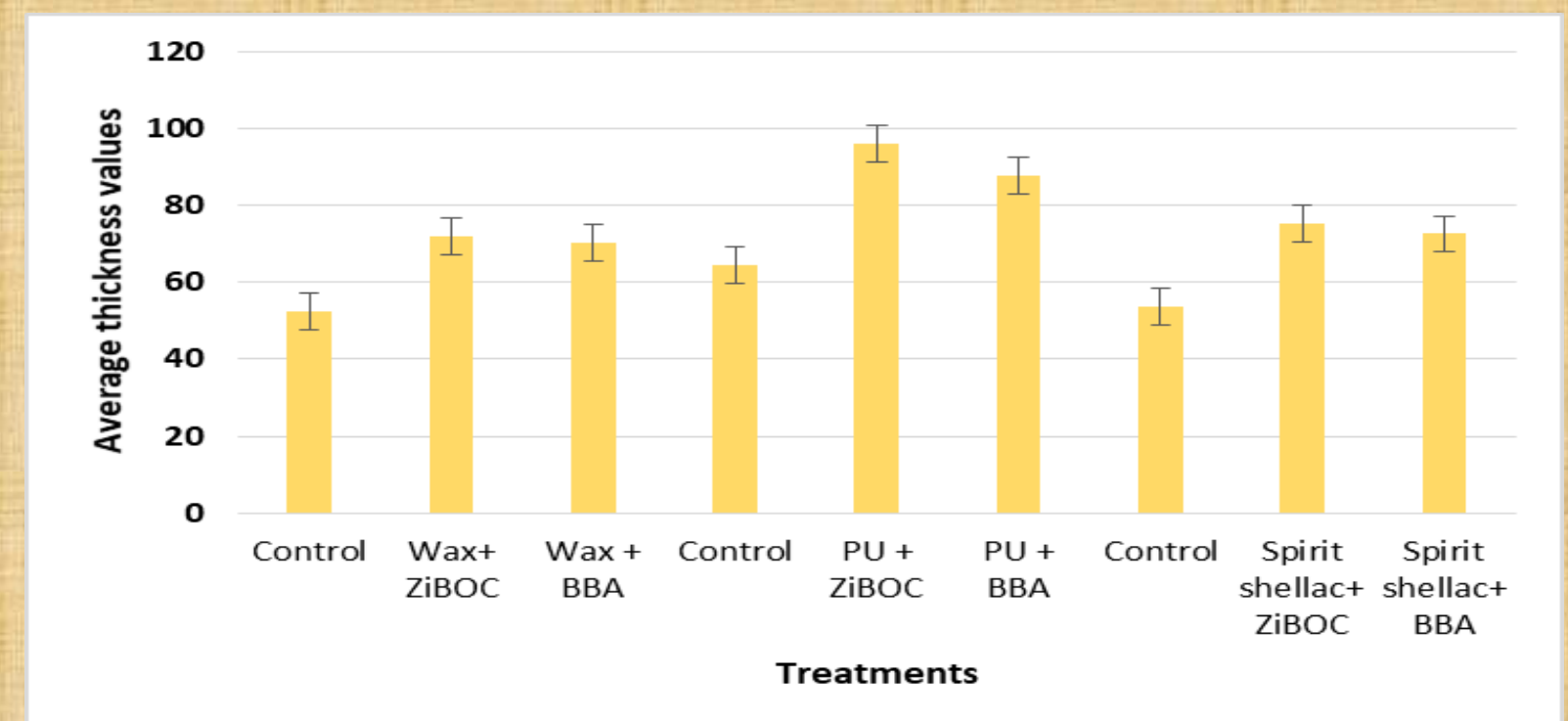


Figure 4: Average thickness values (microns) of preservative treated and control samples of *Melia dubia* treated with wax, PU and spirit shellac polish.

CONCLUSION

- In the present study the average gloss and thickness values of *Melia dubia* samples impregnated with preservatives along with wood coatings i.e. wax, PU, or spirit shellac demonstrated, the increase in gloss and thickness values when compared with untreated wood.
- The interaction between coatings and preservatives significantly improved the performance of the wood characteristics.

FUTURE WORK / REFERENCES

1. Nejad, M. (2011). *Coating performance on preservative treated wood* (Vol. 73, No. 05).
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