

Supplementary materials

# Development of Nanocoated Filaments for 3D Fused Deposition Modeling of Antibacterial and Antioxidant Materials

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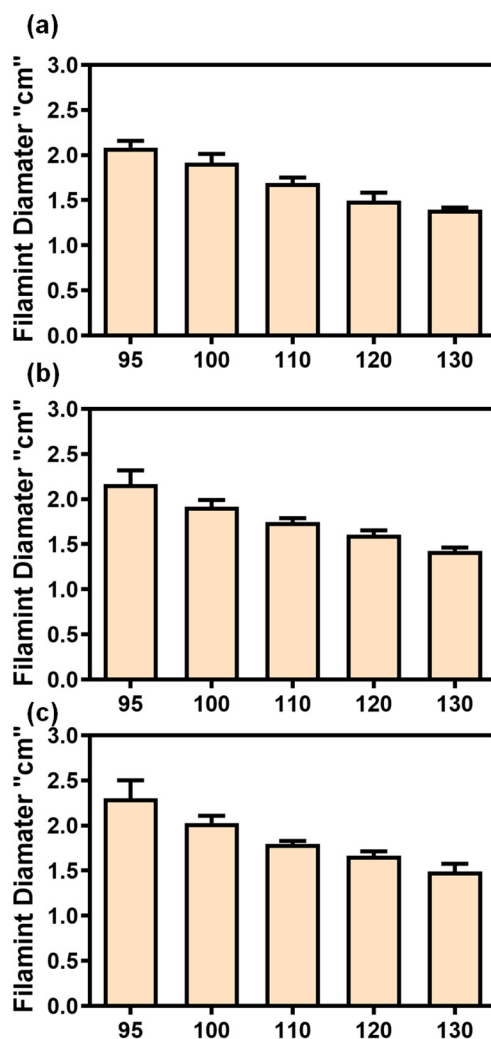
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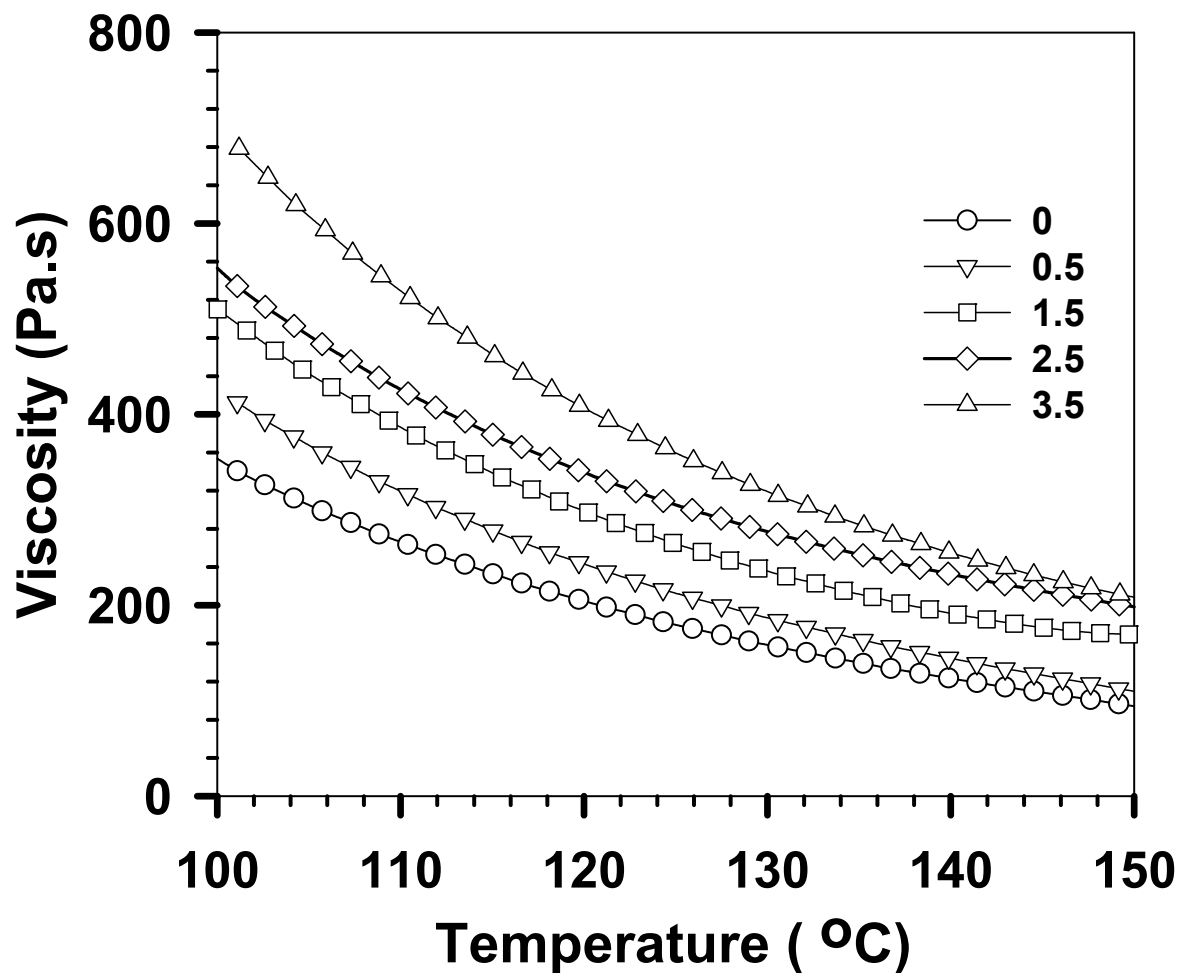
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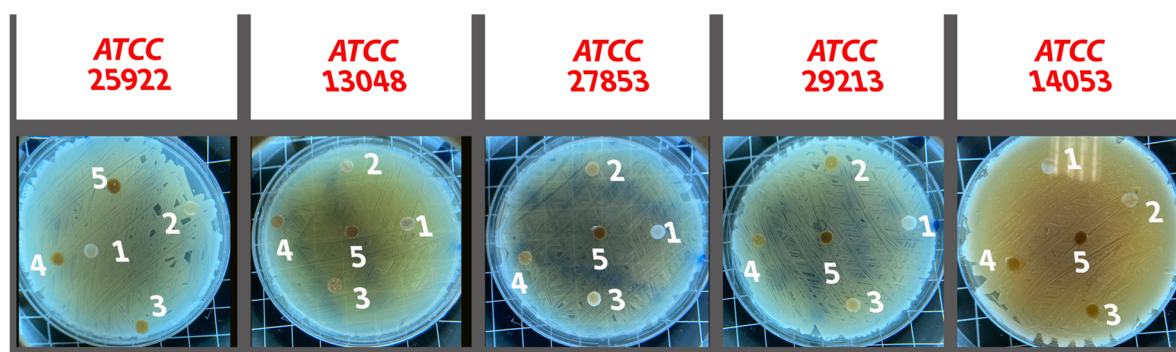
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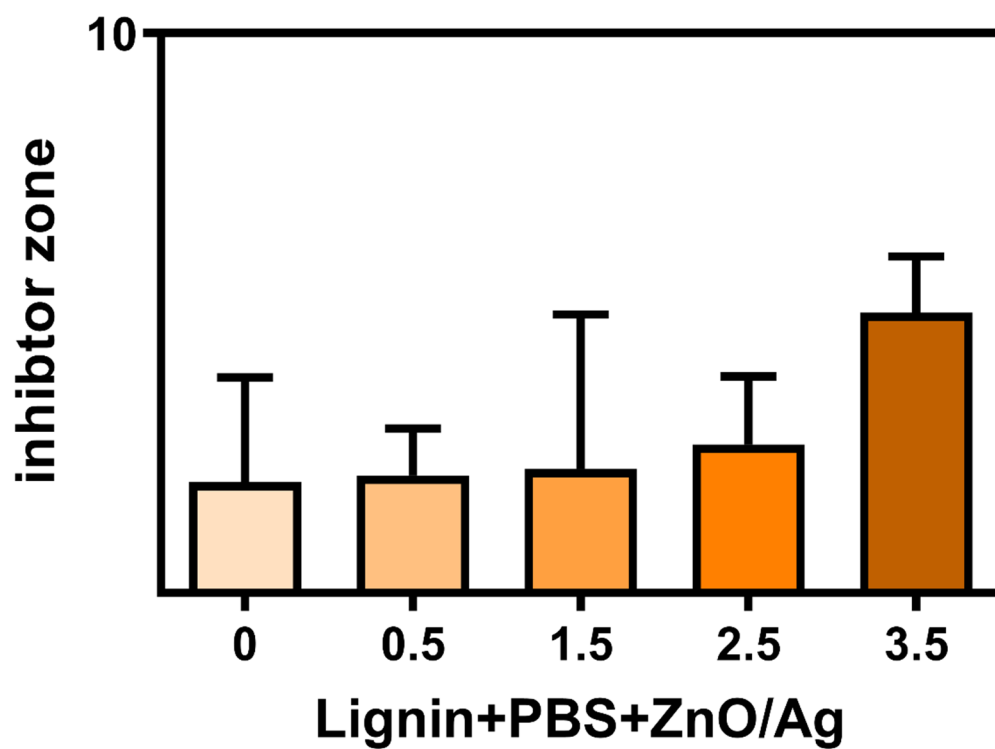
**Figure S1.** Fabrication of the 3D printing filament at different extrusion temperature and 5 kg/h (a), 4 kg/h (b), and 3 kg/h (c) of feed rate.



**Figure S2.** The temperature-dependent variation of complex viscosity of composite with different lignin mass fraction.



**Figure S3.** Representative inhibition zone of the non-coated composites against against 5 different microorganism.



**Figure S4.** Inhibition zone of the composites with different mass fractions of lignin coated by Ag/ZnO against *Escherichia Coli*. There is no significant difference in the data



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