

## MWP – Young Researcher Abstract 2023

<b>Project title:</b> Fully bio based transparent composite with high wood volume fraction	
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<b>Abstract</b> (approx. 200 words):  The transition to renewable raw materials is of highest interest and importance in the course of the bioeconomy. Wood in particular plays an essential role and has recently been experiencing a kind of renaissance. Various chemical modifications can be applied to this natural forest product in order to improve its properties and generate advanced products. Through the structure-preserving removal of the wood components lignin and hemicelluloses highly oriented cellulose scaffolds can be obtained. The delignified wood is a versatile substrate for manufacturing transparent biocomposites that are capable of replacing fossil-based materials. The investigations relate to the delignification and functionalization of veneer with different approaches. Delignification was performed in an environmentally friendly Acetosolv-process, which enables selective fractionation of biomass. The porous, lignin-reduced material with a low bulk density has a significantly higher degree of whiteness and hygroscopic wetting behavior. The obtained scaffolds were washed and impregnated with bio polymers. Subsequent compressing enhances the luminous transmittance of the tissues. Moreover, the delignified veneers can form composites by densification without adhesives. The research should contribute to developing sustainable lightweight materials based on wood that are mechanically strong yet aesthetic substitutes of energy-intensive materials.	
<b>Key words:</b> transparent wood, delignification, biocomposites, fiber materials, chemical modification	