

MWP – Young Researcher Abstract 2023

Project title: Wood hemicellulose derivatives with tailored surface activity towards aqueous dispersion coating	
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Abstract (approx. 200 words): <p>Dispersants are vital in various materials and products like packaging, paints, adhesives, and sealants. However, conventional surfactants used as dispersants, derived from petroleum or toxic compounds, present safety and environmental challenges. This necessitates the exploration of environmentally safer and sustainable alternatives.</p> <p>This study focuses on the potential of underutilized resources and exploring their value-added applications in various industries. Specifically, the focus is placed on hemicelluloses, which possess significant value-added potential. Current forest industry processes, often overlook lignocellulosic components beyond cellulose and are often considered waste streams. The present study utilizes galactoglucomannans (GGMs), the major type of hemicelluloses found in softwood, which have been identified as a promising material to produce bio-based surfactants.</p> <p>The objective of the study is to synthesize an amphiphilic derivative of GGM by grafting naturally occurring fatty acids on the GGM chain to create a bio-based surfactant. Firstly, GGM is fractionated into different molar masses to assess a potential correlation between molar mass and physiochemical properties, such as surface tension and hydrophilic-lipophilic balance (HLB). Furthermore, different ratios of GGM and fatty acids as well as different fatty acid chain lengths are tested to tailor the HLB and surface tension to attain characteristics with desired dispersing ability.</p>	
Key words: Aqueous dispersion, bio-based, galactoglucomannans, hemicellulose, suberin, surfactants.	