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MWP – Young Researcher Abstract 2026

Project title: Towards High-Yield, High-Strength Pulps via Oxygen Delignification	
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Abstract (approx. 200 words)**:** High-yield pulps, such as spruce chemi-thermomechanical pulp (CTMP) and birch neutral sulfite semichemical pulp (NSSC), offer significant yield advantages over kraft pulps but are limited by lower tensile strength and reduced fiber bonding. Post-pulping treatments aimed at narrowing the performance gap between chemical pulp and high-yield pulps have therefore attracted increasing interest. My research investigates oxygen delignification as a mild, yield-preserving post-treatment to overcome these limitations and achieve the full potential of high-yield fibers. The results show that oxygen delignification increases the weak acid group content and WRV, with a stronger response observed for CTMP than for NSSC. These changes lead to significant tensile strength improvements in both pulps while largely preserving yield. This approach could improve material efficiency and reduce the environmental footprint of fiber-based products by lowering wood demand and processing intensity. The long-term vision is to reposition high-yield pulps as key material for next-generation lignocellulosic materials, from sustainable packaging to advanced fiber-based products, through targeted, yield-preserving property modification.	
Key words: High yield pulps, mechanical pulp, oxygen delignification, paper strength, semichemical pulp.	