

MWP – Young Researcher Abstract 2026

Project title: Low energy thermomechanical pulp (Chemi–Asplund fibers) for improved strength properties	
Author: Dia Kongthong	
Affiliation: Fiber Science and Communication Network (FSCN), Mid Sweden University, Sundsvall, Sweden	E-mail: diapornpan.kongthong@miun.se
Abstract (approx. 200 words): My research explores how low-energy hardwood thermomechanical pulp can be transformed into strong, binder-free fiber materials for sustainable packaging. I focus on birch, a widely available Nordic hardwood that needs higher-value applications to remain competitive with fast-growing plantation species such as eucalyptus. The work combines three steps: the Chemi–Asplund process, a mild peracetic acid post-treatment and hot pressing. This approach produces very high-yield pulp while using low refining energy and preserving most of the lignocellulosic structure. The post-treatment selectively modifies fiber surfaces and hot pressing then activates the remaining lignin to create significantly stronger fiber-to-fiber bonding. My vision is to enable resource-efficient, fossil-free packaging materials from hardwood fibers that are often underused today. A key challenge in sustainable material development is improving strength without sacrificing yield or increasing energy demand. My results show that this trade-off can be addressed. By combining low-energy processing with targeted fiber surface engineering, this research can help the forest-based industry develop stronger, more sustainable materials with lower environmental impact and broader raw-material utilization.	
Key words: Low-energy processing, thermomechanical pulp, Chemi–Asplund fibers, birch wood; fiber strength, hot pressing, sustainable packaging.	