

Interrelations Between Genotypes, Year of Growth, Biochemical Composition, Histological Structure and Plant-Polymer Composite Mechanical Traits For Maize, Sorghum and Miscanthus

Patrick Navard^{*a}, Loan T. T. Vo^a, Jordi Girones^a, Lucie Chupin^a, Erika Di Giuseppe^a, Anne Clément Vidal^b, Armelle Soutiras^b, David Pot^b, Denis Bastianelli^c, Laurent Bonnal^c, Emilie Gineau^d, Matthieu Reymond^d, Catherine Lapierre^d, Lauret Cézard^d, Frédéric Legée^d, Grégory Mouille^d, Stéphanie Arnoult^e, Maryse Brancourt-Hulme^f, Luc Vincent^g, Alice Mija^g, Lata Soccalingame^h, Stéphane Corn^h, Nicolas Le Moigne^h

^a MINES ParisTech, PSL Research University, CEMEF** - Centre de mise en forme des matériaux, CNRS UMR 7635, CS 10207 rue Claude Daunesse 06904 Sophia Antipolis Cedex, France

^b CIRAD, UMR AGAP, Avenue Agropolis, F-34398 Montpellier, France

^c CIRAD, UMR SELMET, Avenue Agropolis, F-34398 Montpellier, France

^d INRA, Institut Jean-Pierre Bourgin, UMR1318 INRA-AgroParisTech, ERL3559 CNRS, Saclay Plant Sciences, 78026 Versailles, France

^e INRA, UE GCIE, Estrées-Mons, 80203 Péronne, France
stephanie.arnoult@inra.fr

^f INRA Agrolmpact, Site d'Estrées-Mons BP 50136, 80203 Péronne cedex, France
maryse.brancourt@inra.fr

^g Université Nice Sophia Antipolis, CNRS, LPMC, UMR 7336, 06100 Nice, France
luc.vincent@unice.fr, alice.mija@unice.fr

^h Centre des Matériaux des Mines d'Alès (C2MA), École des Mines d'Alès, F-30319 Alès Cedex, France

* patrick.navard@mines-paristech.fr

This presentation will focus on the use of elongated plant fragments directly obtained after grinding plant stems for preparing polymer composites. We developed a robust method able to discriminate stem fragments according to their reinforcing capacity. We studied three genetically related crops: miscanthus, maize and sorghum. Fragments were collected on varied stem positions on 13 miscanthus genotypes of 7 to 9 years old, 10 sorghum genotypes selected among a panel of 396 genotypes and 10 genotypes of maize. This panel offers a very large range of plants from which stem fragments can be prepared. The work focused on the relationships between the composition and histological structures of stem fragments and (1) the mechanical properties of the individual fragments, (2) their thermal stability and (3) the mechanical performances of polymer composites. Based on these analyses, we will be able to assess how the variability of plant structure and composition is influencing the final mechanical properties of polymer composites.

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