Short Communication

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Bioenergy 2020: Assessment of durum wheat straw genotypes with improved saccharification efficiency

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The increasing worldwide demand for energy combined with the depletion of fuel reserves and concerns about global climate change, have increased the interest within the production of fuels from renewable energy sources. Lignocellulosic biomass has considerable potential as feedstock for the assembly of biofuels and biochemicals, contributing to decreasing CO2 emissions, one among the drivers of global climate change. The worldwide production of cereals straw, a by-product left after grain harvest, represents an abundant source of biomass for lignocellulosic-based biorefineries. The conversion of the lignocellulosic biomass to final biobased products like alcohols mainly requires a three-step process: 1) pretreatment; 2) acid or enzymatic hydrolysis; 3) fermentation. An efficient digestibility of the lignocellulosic materials is prime for the general feasibility of any final bioproduct. Within the present work a group of durum genotypes, selected from a germplasm collection, was wont to analyze some phenotypic traits and biochemical aspects of the cell membrane. These characteristics were correlated with the enzymatic digestability. The foremost objective was to spot the most profitable genotype(s) to be used as feedstock for bioethanol production. A big variability was observed within genotypes within the release of sugars after enzymatic hydrolysis. The results evidenced that the lignin content was the main component of the cell membrane determining recalcitrance to the enzymatic process. As for association to phenotypic traits, positive correlations were found with plant height and uronic acids content. The possible role of other cell membrane components is additionally discussed.

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