

SUNLIBB-CeproBio Joint deliverables related to SUNLIBB WP3.

JD3.1 Identification of gene candidates in matrix polysaccharide synthesis based on work in model species

The aim of this joint deliverable was to find new gene candidates using the transcriptomic data of Maize, Miscanthus and Sugarcane. We aimed to look for co-expression with orthologues of model species genes. Whilst it was possible to look at the data of Biogemma on Maize, and SUCEST data on sugar cane (see JD3.3), the transcriptomic data of Miscanthus has not been available until recently. Therefore, the compilation of this analysis will be completed in the last reporting period.

JD3.2 Detailed characterisation of maize, Miscanthus and sugarcane matrix polysaccharides

The aim here was to compare the structure of grass matrix polysaccharides in the three grasses. Sugar cane was received from Brazil Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br), and xylan digested and analysed by DASH and mass spectrometry. As seen in the report of SUNLIBB D3.2 and 3.3, the structures have been identified and compared. Figures and structures are shown in those two deliverables. The conclusion is that these grasses have similar matrix polysaccharides. There may be some differences, and this will be further investigated.

JD3.3 Identification of additional 30 gene candidates involved in matrix polysaccharide synthesis

The aim of this Deliverable was to use the known xylan synthesis genes from model organisms and to identify the probable orthologues in Maize, miscanthus or sugarcane. Maize orthologues were found by P9 and by BioGemma. Access to the SUCEST sugar cane database was granted by Glauca de Souza (Proj. 2 coordinator, Br). The Brazilian database was searched, and some candidates found for xylan arabinosyltransferases. These are in spreadsheet SUNLIBB D3.4. The miscanthus sequences are being identified currently by Luisa Trindade (P13, WU). These are delayed because of the technical problems of miscanthus sequence generation.

JD3.4 Identification of activity of 3 new enzyme activities

The aim was to identify the activity of three new enzymes. As detailed in SUNLIBB deliverable 3.5, several new activities have been studied. In particular GT61 enzymes are known to be xylan arabinosyltransferases. Together with Igor Polikarpov (Br), these have been expressed in E.coli and crystallisation trials are underway, in order to determine the structure of the enzyme. As this has never been achieved for any plant cell wall polysaccharide synthesis enzyme, this would be a major achievement, and may allow us to understand that differences in activity of this broad class of enzymes.