FIBRE QUALITY WORKSHOP

Université de Lille (FR) on January 18th 2016

The EC MultiHemp Project Consortium, in collaboration with a selection of experts, is offering a 1 day workshop to PhD students and Young researchers interested in the multifaceted world of using natural fibre crops for industrial applications.

Workshop programme:

09:55 **Welcome**

by **Simon Hawkins,** Unité de Glycobiologie Structurale et Fonctionnelle, Université de Lille

Stefano Amaducci, Scientific Coordinator Multihemp, Università Cattolica del Sacro Cuore

10:00 **Stefano Amaducci (Università Cattolica del Sacro Cuore) – Multihemp**

Following a multidisciplinary approach the EC project Multihemp aims to advance the use of hemp as a multipurpose crop. An introduction to the general strategy of the project, main objectives and a particular reference to hemp cultivation will be given.

10:30 **Jörg Müssig (Hochschule Bremen, City Univeristy of Applied Sciences) - The Importance of Fibre Quality for Industrial Applications.**

The main argument against industrial use of natural fibres is that quality depends on environmental conditions (in the field). However, it is possible to obtain fibres of consistent quality, and enhance predictability of the properties of natural fibre products by using a quality management system.

11:00 Coffee break

11:30 **Alexandra Lanot (Univeristy of York) - A biotechnological approach to hemp fibre quality.**

A key part of Multihemp is the development of new hemp varieties with improved quality for biorefinery applications. One approach is non-transgenic reverse genetics using TILLING to screen a mutant population for alterations in genes associated with fibre quality.

12:00 **Brigitte Chabbert (Fractionnement des AgroRessources et Environnement INRA/URCA FARE) - Cell-wall architectures in fibre crops.**

The physicochemical properties of fibers are related to their morphology and the structural characteristics of the cell walls and may greatly vary according to the fiber processing and their biological variability. Indeed plant fibers can be produced from a range of species and represent different tissues and cells. Plant fibers can be considered as complex composites material showing hierarchical and multilayered structures. Fibers exhibit micro-and nanostructural heterogeneity owing to the presence of different wall layers and corresponding chemical and structural arrangements.

Workshop programme continued:

12:30 **LUNCH**

13:30 **Simon Hawkins (Université de Lille) – Multiple approaches provide novel information on flax cell wall biology.**

Improvement in the quality of natural-fiber derived products (e.g. textiles, composites) not only depends upon a better understanding of post-harvest processing (retting, mechanical extraction, spinning, incorporation into composites etc.), but also requires greater knowledge about how plants construct these remarkable cells, as well as about the different factors (genetic, environment) affecting fiber properties and production. A wide range of different approaches (genomics, transcriptomics, proteomics, imaging and metagenomics) is currently allowing us to make significant advances in our knowledge about flax cell wall biology. Different examples will be rapidly presented to illustrate this point. The use of similar approaches in hemp should also lead to a better understanding of different biological processes in this economically interesting species.

14:00 **John Vidmar (Alberta Innovates Technology Futures) - Hemp in Canada, the fibre that counts is the one in the seed.**

John Vidmar is program leader at Alberta Innovates Technology Futures; he will conclude the presentations with a complementary view on natural fibres.

Presentations from PhD students and Young researchers

14:30-15:00 **2 presentations (15 minutes each) – speakers to be selected**

15:00 Coffee break

15.15-16:00 **3 presentations (15 minutes each) – speakers to be selected**

16:00-17:00 Open discussion on methodologies.

Closing comments from Simon Hawkins and Stefano Amaducci.

The workshop was attended by 35 PhD students from around Europe and (contrary to the original programme) 8 were selected to make a presentation; 4 presentations with a biotechnological interest, and 4 with a technological interest. The feedback from all attendees was positive.

The presentations given at the workshop were available for download for a limited period via the project website (http://multihemp.eu/fibre_quality/)

The MULTIHEMP Project members and Scientific Coordinator give particular thanks to Simon Hawkins for having so willingly hosted the workshop, and having shared his shared his expertise with the whole consortium during the Annual General Assembly meeting.

LONG FIBRE TECHNICAL MEETING

Linificio Canapificio S.p.A., Villa d'Almè (BG) ITALY

Wednesday 18th January, 2017

Participants:

Multihemp Consortium: Stefano Amaducci, Jörg Müssig, Hans Jörg Gusovius, Carsten Lühr, Gianpaolo Grassi, Albert Hernandez-Estrada, Aart Willem Van Vuure, Claire Thouminot, Alexandra Lanot

University of Franche-Comté, Besançon (France): Vincent Placet as invited speaker and member of Scientific Advisory Board of Multihemp.

From Linificio: Pierluigi Fusco Girard (Director of Linificio), Massimo Lolli (Director of Research), Giorgio Rondi (Consultant).

Summary:

Meeting started at 14:00 with a presentation of Linifico activities, market etc by Fusco. A visit to Linifico spinning lines and quality laboratory followed.

At 15:30 after coffee break the meeting continued with presentations from Vincent Placet (Developing high-grade hemp-based composites: recent advances and major challenges), Stefano Amaducci (Introduction to Multihemp project) and Jörg Müssig (The Importance of Bast Fibre Quality for Textiles in Technical Applications).

During and after the presentation there was a lively discussion on the challenges and constraints of hemp fibre use for high quality composite materials.

The main quality traits highlighted during the discussion were: (i) fibre refinability (this characteristics is very relevant for the wet spinning lines used at Linificio as it provides an indication on the metric count that can be obtained in the yarn - it depends on the number of cells and bundles present per unit surface of the fibre transversal section), (ii) colour (as an indication of retting degree), and (iii) fibre strength, resistance and finesses.

In conclusion Massimo Lolli indicated that for future investment it is very relevant that hemp can be cultivated for multiple applications.

*The MULTIHEMP Project members and Scientific Coordinator give special thanks to **Linificio Canapificio S.p.A.** for having so willingly hosted the Technical meeting, for having let the participants visit the production facilities, and for having shared their industrial expertise on hemp.*