



HAL
open science

Deciphering cork formation in *Quercus suber*

Jorge A.P. Paiva, Pedro Fevereiro, Pedro Marques, José Carlos Rodrigues, Grégoire G. Le Provost, Christophe Plomion, Jacqueline Grima Pettenati, Olivier Bouchez, Christophe C. Klopp, Helene H. Berges, et al.

► **To cite this version:**

Jorge A.P. Paiva, Pedro Fevereiro, Pedro Marques, José Carlos Rodrigues, Grégoire G. Le Provost, et al.. Deciphering cork formation in *Quercus suber*. BMC Proceedings, 2011, 5 (Suppl 7), pp.172. hal-02649545

HAL Id: hal-02649545

<https://hal.inrae.fr/hal-02649545>

Submitted on 29 May 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

POSTER PRESENTATION

Open Access

Deciphering cork formation in *Quercus suber*

Jorge AP Paiva^{1*}, Pedro Fevereiro², Pedro Marques³, José Carlos Rodrigues⁴, Grégoire Le Provost⁵, Christophe Plomion⁵, Jacqueline Grima-Pettenati⁶, Olivier Bouchez⁷, Christophe Klopp⁸, Hélène Berges⁹, José Graça¹⁰

From IUFRO Tree Biotechnology Conference 2011: From Genomes to Integration and Delivery Arraial d Ajuda, Bahia, Brazil. 26 June - 2 July 2011

The family of *Fagaceae*, comprises about 900 species, among them the best-known group of this family is the oaks, genus *Quercus*, that are commonly used as timber or for cork production. Cork is produced by *Q. suber*, an evergreen oak with major economic and environmental importance for Mediterranean region, in particular for Portugal that is the leading producer of this material.

Besides, the economic importance of cork production and cork manufacturing, little attention has been paid to the molecular mechanisms underlying wood and cork formation as well as cork quality. To overcome this constraint, an international partnership (SuberGene) was established 2008, involving Portuguese and French research institutions and one Producer's Association organization (FJLF). The main driving force of this partnership is to join efforts and complementary skills to unravel to the molecular mechanisms underlying cork formation and decipher the structural polymorphisms and regulation network that determine cork quality.

A non-normalized cDNA library of developing phellem (DP) was produced and 5,000 clones were sequence both ends using Sanger technology. More than 6500 good quality ESTs were deposit at GeneBank. DP transcriptome was also assessed by pirosequencing (454FLX Titanium, Roche) generating more than 200,000 reads. Sequencing data (238,911 ESTs) data were assembled into 69,559 contigs. Suberin biosynthesis genes such as Glycerol-3-phosphate acyltransferase and Omega-hydroxypalmitate O-feruloyl transferase are among the more expressed genes in DP tissues. More than 2,800 putative SNPs were detected in 1,121 contigs. As a complementary strategy,

the proteome of DP are being assessed, by 2D-PAGE, and mass spectroscopy. In order to get more information about the gene structure of genes related with the suberisation of cork cell-wall, one *Q. suber* BAC library have been constructed, and are being characterized. Clones harboring genes of interest were identified by screening high-density filters of this BAC library.

These resources provides us with valuable tools to study the nature of the molecular machinery involved in cork formation, and most importantly with the players involved in the variability of cork characteristics. Future ongoing approaches and the impact of these finding will be discussed.

Acknowledgments

The authors would like to thank the valuable contribution of actual and former members of the involved groups and institutions: Susana Araújo¹, Victor Carocha¹, Cláudio Capitão², Clara Graça², Joana Amado², Céline Lalanne⁵, Nathalie Ladouce⁶, Céline Noirot⁸, Elisa Prat⁹, Sonia Vautrin⁹, Joelle Fourment⁹.

This work was partially supported by FCT (Portugal) (PTDC/AGR-GPL/101785/2008). Authors also acknowledged FJLF that provided the plant material necessary for this work.

Author details

¹Instituto de Investigação Científica Tropical (IICT), FLOR-Centro de Florestas e dos Produtos Florestais, Tapada da Ajuda, 1349-018 Lisboa, Portugal & Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2781-901 Oeiras, Portugal. ²Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2781-901 Oeiras, Portugal. ³Fundação João Lopes Fernandes (FJLF), Herdade do Leitões 7425-014 Montargil, Portugal. ⁴Instituto de Investigação Científica Tropical (IICT), FLOR-Centro de Florestas e dos Produtos Florestais, Tapada da Ajuda, 1349-018 Lisboa, Portugal. ⁵INRA-UMR 1202 - BIOGECO - "BIODiversité, Gènes et Communautés" (INRA-UMR BIOGECO) Site de Recherches Forêt Bois de Pierroton, 69 route d'Arcachon, 33612CESTAS Cedex, France. ⁶UMR CNRS/Université Toulouse III 5546, Pôle de Biotechnologies Végétales, 24 chemin de Borde Rouge, BP42617 Auzeville, 31326 Castanet Tolosan, France. ⁷Plateforme Génomique, Génopole Toulouse/Midi-pyrénées, INRA Auzeville, Chemin de Borderouge-BP 52627, 31326 Castanet-Tolosan, France. ⁸INRA-Toulouse, BIA, 31326 Castanet-Tolosan, France. ⁹INRA-CNRGV, Chemin de Borde Rouge, 31326 Castanet-Tolosan, France. ¹⁰Instituto Superior de Agronomia (ISA/UTL) Tapada da Ajuda 1349-017Lisboa, Portugal.

* Correspondence: jorge@itqb.unl.pt

¹Instituto de Investigação Científica Tropical (IICT), FLOR-Centro de Florestas e dos Produtos Florestais, Tapada da Ajuda, 1349-018 Lisboa, Portugal & Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2781-901 Oeiras, Portugal

Full list of author information is available at the end of the article

Published: 13 September 2011

doi:10.1186/1753-6561-5-S7-P172

Cite this article as: Paiva et al.: Deciphering cork formation in *Quercus suber*. *BMC Proceedings* 2011 5(Suppl 7):P172.

**Submit your next manuscript to BioMed Central
and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

