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Identification and early detection of *Cryphonectria parasitica* and *Ceratocystis platani* occurring on trees in Europe

Attention paid to tree diseases caused by pathogenic fungi has increased in recent years, due to serious outbreaks such as those caused by *Hymenoscyphus fraxineus* (ash dieback). The Euphresco project CERACRY (09/2016-08/2018) focusses on two pathogens which have been present for a long time in Europe, but were originally introduced from other continents: *Cryphonectria parasitica*, causing chestnut blight in sweet chestnut (*Castanea* spp.), and *Ceratocystis platani*, causing canker stain disease of plane trees (*Platanus* spp.).



The CERACRY project aims to collect information on the distribution of the diseases and characterize the European fungal populations. The project brings together scientists, regulators/governmental officials and 'tree doctors'/diagnosticians.

In the last decade, *C. parasitica* has been detected in an increasing number of locations (and countries). The latest countries to report the fungus were the Netherlands, United Kingdom and Belgium. In the Netherlands, the first finding of chestnut blight dates back to 1995, in the very south of the country. Since then, the disease was found in five or six other areas, the most northern location being a town near Utrecht. In the United Kingdom *C. parasitica* was found for the first time in the autumn 2011, in a plantation of sweet chestnut for chestnut production. Since then, new outbreaks have occurred in the wider environment in Devon, Dorset and East London (2016-2017). In 2014, the first finding of *C. parasitica* in Belgium was reported, and since then 8/9 new locations were found. An interesting observation was that of the fungus growing as a saprophyte on chestnut posts surrounding a garden.



The collaboration allowed more than 100 isolates of *C. parasitica* to be collected from different countries; the material is now stored in the fungal collection of the Walloon Agricultural Research Centre (BE). This collection was used to study the genetic diversity of *C. parasitica* populations. A new technique called Genotyping By Sequencing (GBS) was used for the analysis of the genetic diversity of the isolates, and its performance compared to classic microsatellite based assessment (Simple Sequence Repeats, SSR). The first results of the GBS-analysis showed that the technique is more sensitive than SSR-analysis. With GBS, scientists were able to obtain information on the isolates: the 139 samples were grouped into 10 different clades. Remarkably, it appeared that the genetic diversity of *C. parasitica* isolates from countries (e.g. Britain and Belgium) only recently invaded by the fungus, was higher than expected. Such a diversity could only be explained by multiple introductions. The pathogen might also have been present for a longer time than was known.

A test performance study (TPS) to obtain validation data for the real-time PCR of Pilotti *et al.*, 2012¹ was organised in 2017 and involved 9 laboratories in Belgium, France, Italy and the United Kingdom. The results of the TPS will be published in the next months.

Project ID: Identification and early detection of *Cryphonectria parasitica* and *Ceratocystis platani* occurring on trees in Europe ([CERACRY](#))

¹ Pilotti M., Lumia V., Di Lernia G. and Brunetti A. Development of Real-time PCR for in wood-detection of *Ceratocystis platani*, the agent of canker stain of *Platanus* spp. European Journal of Plant Pathology 134, 61–79 (2012).



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