

Sentinel arboreta as 'bridge environment' to study novel host-pathogens interactions and detect potentially alien plant pathogens

Short Term Scientific Mission (STSM), COST Action FP1401

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Period: 17/02/2016 to 15/03/2016

Summary

The sentinel arboreta concept has been proposed as an efficient strategy to identify plant pathogens attacking tree species native to different geographical areas. The close contact of tree species from different areas in the world facilitates host jump by plant pathogens and may lead to identification of novel host-pathogen interactions. The main aim of this STSM was the classification of 350 selected fungal cultures obtained from a survey of leaves and/or shoots of 38 *Quercus* species from different geographic origins at the Ataturk arboretum. The classification was based on neutral molecular markers and morphological characteristics, and their known or potential pathogenicity. The work was performed in collaboration with Dr. Carmen Morales Rodriguez, who sampled the trees.

During the STSM, all the fungal cultures were checked for contamination, DNA was extracted and a check quality performed, followed by amplification with ITS marker and a check for the amplification product. Samples were prepared for sequencing and sent to a sequencing company.

At the moment the work is still ongoing at the University of Tuscia. The work still to be done is merging of forward and reverse sequences and manual editing of chromatograms and blast of the sequences on G-BANK to identify the OTUs. A phylogenetic approach may be necessary for identification of sequenced species that are not in the database. OTUs will be ranked for known or potential pathogenic role based on current literature. Linking of the OTUs to hosts with the observed symptoms also remains to be done. As mentioned, elaboration of data is still ongoing, but first results are shown in Table 1. Based on the results obtained will be prepared a list of known or putative forest pathogens potentially causing symptoms on native and/or exotic hosts and a model of 'host jump' events among *Quercus* species.

Table 1: Summary of the identified fungal community and geographic origin of the sampled hosts.

Fungal taxon	Geographic origin of host						
	Europe	Asia	Minor Asia	North America	Central America	South America	North Africa
<i>Alternaria alternata</i>	x	x	x	x			
<i>Alternaria sp.</i>	x	x	x	x			
<i>Alternaria tenuissima</i>	x			x			
<i>Aspergillus sp.</i>			x				
<i>Aureobasidium pullulans</i>				x			
<i>Biscogniauxia nummularia</i>		x					
<i>Botryosphaeria dothidea</i>	x						
<i>Cladosporium cladosporioides</i>			x				
<i>Cladosporium ramotenellum</i>			x				
<i>Cladoporium sp.</i>		x	x	x			
<i>Cosmospora butyri</i>			x				
<i>Diaporthe rudis</i>		x					
<i>Diaporthe eres</i>		x					
<i>Diaporthe foeniculina</i>				x			
<i>Diaporthe sp.</i>			x	x			
<i>Diplodia corticola</i>			x				
<i>Discula quercina</i>		x	x	x			
<i>Epicoccum nigrum</i>	x	x	x	x			
<i>Monochaetia kansensis</i>				x			
<i>Nigrospora oryzae</i>			x				
<i>Nigrospora sp.</i>		x	x		x		
<i>Nigrospora sphaerica</i>		x	x	x			
<i>Paraconiothyrium brasiliense</i>			x				
<i>Paraphaeosphaeria sporulosa</i>				x			
<i>Penicilium tricolor</i>				x			
<i>Penicillium chrysogenum</i>		x					
<i>Pestalopsis sp.</i>		x	x	x	x		
<i>Phomopsis sp.</i>			x		x		
<i>Phyllosticta capitalensis</i>			x	x		x	
<i>Pleosporales</i>	x	x					
<i>Preussia intermedia</i>			x				
<i>Simplicillium lamellicola</i>	x	x	x	x	x		
<i>Tubakia dryina</i>			x		x		
<i>Tubakia seoraksanensis</i>			x	x	x		x
<i>Tubakia sp.</i>		x	x	x	x		
<i>Ustilaginoidea virens</i>			x				