# Advanced detection tool to limit the spread of devastating tree pathogens

April 30 2019


New easy-to-transport tool, suitable for non-scientists to promote the advanced detection and limits the spread of some of the most devastating tree pathogens in the European context. The technique was developed with the support of the EU-funded Horizon 2020 research and innovation action HOMED. Credit: HOMED

Seeking to prevent the introduction and spread of quarantine tree pathogens, the EU Horizon 2020-funded project HOMED (HOlistic Management of Emerging forest pests and Diseases) supports the development of an innovative tool for on-site detection of pathogens. The tool was developed by a team of scientists from the Institute for Sustainable Plant Protection, National Research Council (IPSP-CNR) and the Department of Agrifood Production and Environmental Sciences (DISPAA), University of Florence and is described in an open access

paper, published in the journal *AMB Express*.

Invasive alien species in trees and plants can have severe economic, ecological and sociological impact. Due to international trade, tourism and other human activities, non-native pathogens spread into new environments, causing a major threat to biodiversity, economy and human health. An effective framework for early warning and rapid response is a crucial element to intercept biological invasions of plant pathogens.

The HOMED-supported innovative tool works for on-site detection of quarantine pathogens, such as Xylella fastidiosa, Ceratocystis platani and Phytophthora ramorum. These are three of the most devastating pathogens of trees and ornamental plants accidentally introduced to Europe, which are causing epidemics with heavy consequences.

Requiring minimum equipment and easy to transport the new diagnostic tool can be also used by non-scientists to quickly and reliably check the health status of live trees and plants. Such user-friendly and compact tools greatly reduce the time usually necessary to take and analyse samples, thus allowing prompt reaction and increasing chances of confinement.

HOMED recognises the need for action and engages forest managers, biosecurity agencies, policy makers and environmental NGOs in the project with the goal to manage emerging forest diseases and thus preserve biodiversity.

Applying a holistic approach, HOMED improves strategies of risk assessment and management by targeting the successive phases of invasion, and developing mitigation methods for each phase—prevention, detection and diagnosis, surveillance, eradication and control tools.

The newly developed detection tool can be used to check the health status of live trees or tree parts, reducing time of analyses and in this way allowing a prompt reaction and potential control of environmental and economic losses. The tool allows a complete analysis in only 30 minutes time and can be applied as point-of-care diagnostics and represents a great advantage to preventing introductions and for applying control measures.

Author and HOMED partner Dr. Alberto Santini comments:

"The use of rapid, specific and sensitive point-of-care methods like the LAMP assays developed in this study could enable phytosanitary services to make immediate management decisions, helping in containing environmental and economic losses. The application of such a portable diagnostic tool, requiring minimum equipment and a few, if any, specific scientific skills could be profitably used to check the health status of live trees or tree parts at the points of entry or in field, thus reducing time of analyses and allowing a prompt reaction."

**More information:** Chiara Aglietti et al, Real-time loop-mediated isothermal amplification: an early-warning tool for quarantine plant pathogen detection, *AMB Express* (2019). DOI: 10.1186/s13568-019-0774-9

Provided by Pensoft Publishers