

INTERNATIONAL WORKSHOP

SURVEILLANCE AND CONTROL OF CASSAVA DISEASES IN AFRICA

PÔLE DE PROTECTION DES PLANTES (3P)
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DIAGNOSTIC TOOLS AT THE 3P CENTER

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A team at the 3P Center is developing diagnostic molecular tools for quarantine bacterial and viral plant diseases. The work relies on the abundant and various data obtained from taxonomy, diversity, epidemiology, and genomic studies of the different pathogens, generated by the 3P Center team and collaborators.

Several sensitive and specific PCR-based protocols have been developed to detect bacterial and viral pathogens (e.g. detection of *Xanthomonas axonopodis* pv. *dieffenbachiae* in *Anthurium* tissues by nested PCR, (Robène-Soustrade et al., 2006. AEM 72: 1072–1078), detection of *X. axonopodis* pv. *allii* in onion seeds by duplex-nested PCR (Robène-Soustrade et al., 2010. AEM 76: 2697–2703), detection and quantification of a wide range of begomoviruses by five duplex real-time quantitative PCRs (Péréfarres et al., 2011. Virol J 8: 389). These methods are useful diagnostic tools for indexing propagative plant material and for international sanitary surveillance of plant material exchanges. These protocols are intended to be referenced as French official methods and EPPO standards (e.g. *X. axonopodis* pv. *dieffenbachiae*).

The team has an expertise in comparing and validating different molecular tools (Delcourt et al., 2013. Plant Dis 97: 373–378) and collaborates with the French agency for food, environmental and occupational health safety (ANSES) to validate the different protocols through both intra laboratories and ring tests involving different European laboratories (Chabirand et al., 2014. Plant Pathol 63: 20–30). We are also innovating into new DNA-based diagnostic technologies by developing an efficient and portable microarray technology to detect and identify different pathogenic and/or genetic groups of *Ralstonia solanacearum*.

The team's competencies span development, assessment, and validation of diagnostic tools as well as management of collaborative studies. We can rapidly adapt to new challenges such as the evaluation and improvement of the sanitary situation of cassava in Africa. We propose to assess different existing diagnostic tests and to innovate into new DNA-based diagnostic technologies if necessary, in order to optimize the diagnostic of the main viral and bacterial pathogens of cassava in Africa.

BROAD RANGE VIRUS INDEXING THROUGH NGS: THE SAFE-PGR CASE STUDY.

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Biological Resources Centers (BRCs) conserve and distribute plant germplasm for research and development purposes. As such, they play a strategic role by providing breeding programs with genitors that are critical for crop adaptation to ongoing environmental and socie-

tal changes. BRCs must guarantee the sanitary status of the resources they distribute, in order to prevent the spread of diseases, particularly for vegetative propagated that do not benefit from the virus sanitation occurring through a seed cycle.