BioCubagro2025

From biotechnological research to agricultural products

June, 8th-13th

Varadero, Cuba

ABSTRACT BOOK

The most recent and novelties results in biotechnology applied to Agriculture. The proactive relationship of Agriculture-biotechnological research between basic science and applied research.

+537 2504369 www.cigb.edu.cu/en/event/biocubagro-2025-2/ biocubagro2025@cigb.edu.cu

CIGB CENTRO DE INGENIERÍA GENÉTICA Y BIOTECNOLOGÍA

Oral Presentations

Loop-mediated isothermal amplification (LAMP) as a viable PCR substitute for diagnostic applications in agriculture.

Rodríguez Cabrera L.[1], Romero Martínez A.[1], Ponce Castillo M.[1], Hernández Hernández D.[1], Rosabal Ayan Y.[1], Guillén García A.[1], Hernández Velázquez A.[1], Rott P.[2,3]

[1]Centro de Ingeniería Genética y Biotecnología (CIGB), La Habana, Cuba
[2]CIRAD, UMR PHIM, 34098 Montpellier, France.
[3]PHIM Plant Health Institute, Univ. Montpellier, CIRAD, INRAE, Institut Agro, IRD, Montpellier, France. lianet.rodriguez@cigb.edu.cu

Sugarcane is one of the most important crops for the production of sugar, alcohol and derivatives. Leaf scald, caused by the bacterium *Xanthomonas albilineans*, is a major disease that affects the production of this plant. Control measures for this disease depend on timely diagnosis to prevent the pathogen's spread. Isolation on selective media, serological and DNA-based molecular assays are among the methods that have been used for early detection of *X. albilineans*. Molecular methods are efficient, sensitive and specific but the most widely used have disadvantages in terms of speed and feasibility for timely use in the field. Loop-mediated isothermal amplification (LAMP) has emerged in recent years as a promising tool for its direct implementation in the field as it requires minimal equipment, is isothermal, rapid, and less susceptible to inhibitors.
In the present work, the use of the LAMP technique was assessed for the detection of *X. albilineans*. Direct amplification of DNA from bacterial isolates was performed using four primers. The presence of the expected amplification products was confirmed by agarose gel electrophoresis. The genetic construct pGEM-Xa, which contains a fragment of a specific *X. albilineans* gene, was obtained and successfully used as a positive control in the diagnostic assay. The efficacy of a rapid method for extracting DNA from sugarcane stalks for LAMP diagnosis was also evaluated.
Our data provide a preliminary demonstration of the feasibility of using LAMP as a diagnostic assay for field testing of leaf scald in hybridization centers, biofactories or production areas. The future validation of this methodology will allow us to have a highly sensitive, specific and fast diagnostic method for the management of an important disease in our country during sugarcane cultivation.
Keywords: LAMP, leaf scald, molecular diagnostics, sugacane, *Xanthomonas albilineans*.