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LAMP based tools for the *in situ* detection of *Clavibacter michiganensis* subsp. *michiganensis* in tomato productions

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The *in situ* early detection of outbreaks is a key component of infectious disease management programs. *Clavibacter michiganensis subsp michiganensis* (Cmm) is one of the main pathogen affecting tomato crop worldwide. Within-host Cmm infection induce leaf blister-like spots, unilateral leaf wilting, fruit bird-eye spots, stem cankers, which can delay or stop fruit ripening and lead to complete plant wilting. These Gram+ bacteria can survive in several reservoirs (e.g. crop residues, and inert material) for a long time. There is no direct and efficient methods to cure plants from Cmm infections. Crop protection against Cmm relies on an integrated management system that includes seed certification and prophylactic methods. The observation of symptomatic plants leads to the confinement of affected plant rows, the removal of diseased tomato plants, and the use of protection clothes. However, early within-host Cmm infection stages do not generally induce clearly identifiable symptoms. Cmm unequivocal signs of infection arise late during the course of infection, which delays the deployment of prophylactic methods and limits the ability to avoid secondary between-host transmission events. To date, there are no completely specific on-site available methods both to early detect Cmm infection outbreaks in plants, and to identify potential primary inoculum sources in different reservoirs. We developed an innovative, simple and fast tool for field-friendly detection of Cmm on inert surfaces, crop residues and infected plants. This tool is based on the amplification of DNA from live bacterial cells through a Loop Mediated Isothermal Amplification technique, and on a colorimetric based revelation of results. The on-site use of this detection tool will contribute to improving the management of bacterial canker through i) the early detection and elimination of primary sources of inoculum and infected plants and ii) the test of disinfection methods of tools and inert surfaces.