

Identification of Viruses Infecting Garlic Plants in Colombia

Authors : Diana M. Torres, Anngie K. Hernandez, Andrea Villareal, Magda R. Gomez, Sadao Kobayashi

Abstract : Colombian Garlic crops exhibited mild mosaic, yellow stripes, and deformation. This group of symptoms suggested a viral infection. Several viruses belonging to the genera Potyvirus, Carlavirus and Allexivirus are known to infect garlic and lower their yield worldwide, but in Colombia, there are no studies of viral infections in this crop, only leek yellow stripe virus (LYSV) has been reported to our best knowledge. In Colombia, there are no management strategies for viral diseases in garlic because of the lack of information about viral infections on this crop, which is reflected in (i) high prevalence of viral related symptoms in garlic fields and (ii) high dispersal rate. For these reasons, the purpose of the present study was to evaluate the viral status of garlic in Colombia, which can represent a major threat on garlic yield and quality for this country 55 symptomatic leaf samples were collected for virus detection by RT-PCR and mechanical inoculation. Total RNA isolated from infected samples were subjected to RT-PCR with primers 1-OYDV-G/2-OYDV-G for Onion yellow dwarf virus (OYDV) (expected size 774pb), 1LYSV/2LYSV for LYSV (expected size 1000pb), SLV 7044/SLV 8004 for Shallot latent virus (SLV) (expected size 960pb), GCL-N30/GCL-C40 for Garlic common latent virus (GCLV) (expected size 481pb) and EF1F/EF1R for internal control (expected size 358pb). GCLV, SLV, and LYSV were detected in infected samples; in 95.6% of the analyzed samples was detected at least one of the viruses. GCLV and SLV were detected in single infection with low prevalence (9.3% and 7.4%, respectively). Garlic generally becomes coinfecting with several types of viruses. Four viral complexes were identified: three double infection (64% of analyzed samples) and one triple infection (15%). The most frequent viral complex was SLV + GCLV infecting 48.1% of the samples. The other double complexes identified had a prevalence of 7% (GCLV + LYSV and SLV + LYSV) and 5.6% of the samples were free from these viruses. Mechanical transmission experiments were set up using leaf tissues of collected samples from infected fields, different test plants were assessed to know the host range, but it was restricted to C. quinoa, confirming the presence of detected viruses which have limited host range and were detected in C. quinoa by RT-PCR. The results of molecular and biological tests confirm the presence of SLV, LYSV, and GCLV; this is the first report of SLV and LYSV in garlic plants in Colombia, which can represent a serious threat for this crop in this country.

Keywords : SLV, GCLV, LYSV, leek yellow stripe virus, Allium sativum

Conference Title : ICPVV 2019 : International Conference on Plant Viruses and Virology

Conference Location : Rome, Italy

Conference Dates : November 11-12, 2019