Disease Note

FIRST REPORT OF POTATO YELLOWING VIRUS INFECTING PEPPER IN ECUADOR

Y. Sivaprasad[1, 2], P. Garrido[1], K. Mendez[1], A. Garrido[1] and L. Ramos[1]

[1]Ecuadorian Agency for Quality Assurance in Agriculture, AGROCALIDAD, Av. Interoceánica km 14 ½, 170184 Tumbaco, Ecuador
[2]Prometeo-Senescyt, Quito-Ecuador

Pepper (*Capsicum annum* L.) is a solanaceous species originating from South and Central America. Potato yellowing virus (PYV), an unclassified putative member of the genus *Ilarvirus*, was first found in potato in Peru (Fuentes *et al*., 1993), later in wild potato (*Solanum fernandezianum*) in Chile (Valkonen *et al*., 1992) and more recently in a native potato (*Solanum phureja*) in Ecuador (Silvestre *et al*., 2011). In December 2014, foliar mosaic and necrotic spotting of leaves and stems accompanied by bud and fruit necrosis were observed in pepper fields of Puembo, in the Pichincha province of Ecuador. Based on the symptomatology, the occurrence of PYV was suspected and confirmed in symptomatic leaves by DAS-ELISA with a specific antiserum provided by G. Muller, International Potato Center, Lima, Peru, and by RT-PCR using universal primers for members of the family *Bromoviridae* (Untiveros *et al*., 2010). The 300 bp amplicon obtained from a symptomatic pepper was purified, custom-sequenced (Macrogen, South Korea) and the nucleotide sequence was deposited in GenBank (KP772263). Sequence analysis (BioEdit v. 7.05) showed 93.1-97% and 78-90% identity with other PYV isolates at the nucleotide and amino acid levels, respectively. A phylogenetic tree constructed at the nucleotide level using MEGA version 4.1 showed that the Ecuadorian PYV isolate from capsicum was closely related to isolate Loja 2 from *S. phureja* in Ecuador (HQ141056). *Solanum* isolates Canete (HQ141057), Russia (KM244740), Loja 1 (HQ141053) and Azuay (HQ141054) formed a separate cluster. To the best of our knowledge, this is the first report of PYV on *Capsicum* in Ecuador.

Fuentes S., Jayasinghe U., 1993. Potato yellowing, caused by a new bacilliform virus. *Fitopatología* **28**:22.

Silvestre R., Untiveros M., Cuellar W.J., 2011. First report of Potato yellowing virus (genus *Ilarvirus*) in *Solanum phureja* from Ecuador. *Plant Disease* **95**: 355.

Untiveros M., Perez-Egusquiza Z., Clover G., 2010. PCR assays for the detection of members of the genus *Ilarvirus* and family *Bromoviridae*. *Journal of Virological Methods* **165**: 97.

Valkonen J.P.T., Contreras A., Pehu E., Salazar L.F., 1992. Naturally occurring viral infections in *Solanum brevidens* and *S. fernandezianum*. *Potato Research* **35**: 411.

Corresponding author: Y. Sivaprasad
E-mail:yeturusivaprasad@gmail.com

Received October 17, 2015
Accepted October 19, 2015

Disease Note

FIRST REPORT OF *PEPPER VEIN YELLOWS VIRUS* IN FIELD-GROWN PEPPER IN IVORY COAST

B.A. Bolou Bi[1], B. Moury[2], K. Abo[3], D. Jr. Kakou[1], G. Girardot[2], N'dri P. Kouassi[1], E.J.N. Kouadio[1], B.S.M. Kouakou[1] and D. Kone[1]

[1]Laboratoire de Physiologie Végétale, UFR Biosciences, Université Felix Houphouët-Boigny, Abidjan 22 BP 582, Côte d'Ivoire
[2]INRA, UR407 Pathologie Végétale, Domaine Saint Maurice, CS 60094, F-84143 Montfavet, France
[3]INPHB, Ecole Supérieure d'Agronomie, PB 1093 Yamoussoukro, Côte d'Ivoire

In 2014 and 2015, leaf samples from field-grown pepper (*Capsicum annuum* L. and *C. chinense* Jacq.) plants showing different kinds of viral symptoms were collected in Ivory Coast. Samples were dehydrated onto calcium chloride before RNA extraction (Tri Reagent, Molecular Research Center, USA). Two-step RT-PCRs were performed as described by Knierim *et al.* (2010) with polyvalent primers for poleroviruses targeting part of the RNA-dependent RNA polymerase, coat protein and movement protein genes. Amplicons of the expected size (*ca*. 1,100 bp) were obtained from four of 20 analyzed *C. chinense* samples originating from Arrah and Bongouanou (South-East Ivory Coast). The source plants exhibited leaf yellowing and rolling as well as stunting. PCR products were sequenced directly (GenBank accession Nos KT825996 to KT825999). Sequence analysis with the BLASTN software showed 97 to 98% nucleotide identity with *Pepper vein yellows virus* (PeVYV) isolates from Mali as closest sequences (Knierim *et al*., 2013). These sequences were aligned with additional ones available in GenBank using ClustalW, leading to a 964-nucleotide alignment. Phylogenetic trees obtained with MEGA6 were consistent between neighbor-joining, maximum-likelihood and maximum parsimony methods and showed that the sequences from Ivory Coast isolates clustered with two pepper isolates collected in 2009 in Mali (accession Nos JX427535 and JX427536) in a separate clade (92% bootstrap value). *Pepper veinal mottle virus* (genus *Potyvirus*) and *Cucumber mosaic virus* (genus *Cucumovirus*) are the two most widespread pepper viruses in Ivory Coast but PeVYV is an additional threat to pepper production in this area.

Knierim D., Deng T., Tsai W., Green S., Kenyon L., 2010. Molecular identification of three distinct *Polerovirus* species and a recombinant *Cucurbit aphid-borne yellows virus* strain infecting cucurbit crops in Taiwan. *Plant Pathology* **59:** 991-1002.

Knierim D., Tsai W.S., Kenyon L., 2013. Analysis of sequences from field samples reveals the presence of the recently described pepper vein yellows virus (genus *Polerovirus*) in six additional countries. *Archives of Virology* **158:** 1337-1341.

Corresponding author: B. Moury
E-mail: benoit.moury@avignon.inra.fr

Received October 17, 2015
Accepted October 19, 2015