



First report of *Pepper yellow vein Mali virus* associated with pepper yellow vein disease in Cote d'Ivoire

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Received: 27 Jan 2017. Published: 27 Feb 2017.

In Mali (Zhou *et al.*, 2008) and Burkina Faso (Tiendrébéogo *et al.*, 2008), pepper yellow vein disease (PYVD) is associated with the African monopartite begomovirus *Pepper yellow vein Mali virus* (PepYVMLV).

In January 2012 and August 2013, severe yellowing, leaf curling and deformation symptoms (Fig. 1), resembling those of PYVD were observed on pepper (*Capsicum* spp.) across Côte d'Ivoire (Table 1). Twenty leaf samples from pepper plants with symptoms were collected and tested for the presence of begomoviruses using a PCR assay with a set of degenerate primers designed to amplify the coat protein gene of Old World begomoviruses (Seka *et al.*, 2016). PCR products of the expected size were obtained from seven samples, suggesting the presence of Old World monopartite begomoviruses (Table 1).

PCR-positive samples were further processed and viral genome sequences were amplified from three samples (Table 1) by rolling-circle amplification, cloned using the restriction enzyme *Bam*HI and sequenced. The three genome sequences were 2,786 nucleotides in length (GenBank Accession Nos. KY271075-KY271077) and showed the highest pairwise sequence identity, 98 to 99%, with PepYVMLV isolates from Burkina Faso (PepYVMLV-[BF:Oua:sweet pepper1:08]; FM876849) and Mali (PepYVMLV-[ML:03]; AY502935). A maximum-likelihood phylogenetic tree constructed with publicly available begomovirus genome sequences (MEGA6; Tamura *et al.*, 2013), confirmed the genetic relationship of the Côte d'Ivoire isolates of PepYVMLV with isolates from neighbouring Burkina Faso and Mali (Fig. 2).

To our knowledge, this is the first report of PepYVMLV associated with PYVD in Côte d'Ivoire. Our results confirm the geographical distribution of PepYVMLV in West Africa and the close genetic relationship of this

viral population (Tiendrébéogo *et al.*, 2008).

Acknowledgements

This study was funded by the Région Réunion, the European Union (FEDER) and CIRAD. K. Séka is a recipient of a fellowship from CIRAD (Action incitative renforcement des compétences des chercheurs du Sud).

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Figure 1

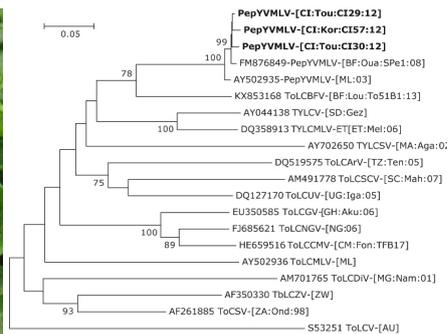


Figure 2

Table 1. Origin of pepper samples sampled in Côte d'Ivoire and results of PCR testing.

Sample	Locality ¹	Region	Date of sampling (dd/mm/yyyy)	GPS coordinates		PCR diagnosis ²
				Latitude	Longitude	
CI7	Yamoussoukro	Centre	15/01/2012	06°51'21.30"N	05°22'50.80"W	+
CI29*	Toumodi	Centre	15/01/2012	06°51'07.30"N	05°00'20.20"W	+
CI30*	Toumodi	Centre	15/01/2012	06°51'07.30"N	05°00'20.20"W	+
CI31	Toumodi	Centre	15/01/2012	06°51'07.30"N	05°00'20.20"W	+
CI43	Abidjan	South	18/01/2012	05°15'50.20"N	03°56'08.70"W	+
CI49	Abidjan	South	18/01/2012	05°15'50.20"N	03°56'08.70"W	-
CI53	Abidjan	South	18/01/2012	05°15'50.20"N	03°56'08.70"W	-
CI56	Aldzangé	South	24/01/2012	06°04'58.25"N	03°52'38.07"W	-
CI57*	Korhogo	North	28/01/2012	09°46'07.10"N	05°29'06.40"W	+
CI58	Bouaké	Centre	28/01/2012	07°32'25.90"N	05°00'27.60"W	+
CI59	Dahou	South	31/01/2012	05°20'15.80"N	04°27'40.40"W	+
CI62	Aghorville	South	31/01/2012	05°40'02.60"N	04°07'29.00"W	-
CI63	Abidjan	South	31/01/2012	05°16'12.20"N	03°56'08.70"W	-
CI68	Yamoussoukro	Centre	24/08/2013	06°52'00.00"N	05°24'53.40"W	-
CI91	Toumodi	Centre	25/08/2013	06°24'13.70"N	05°00'27.20"W	-
CI92	Toumodi	Centre	25/08/2013	06°24'13.70"N	05°00'27.20"W	-
CI100	Toumodi	Centre	25/08/2013	06°24'13.70"N	05°00'27.20"W	-
CI108	Abidjan	South	26/08/2013	05°15'50.20"N	03°56'08.70"W	-
CI109	Abidjan	South	26/08/2013	05°15'50.20"N	03°56'08.70"W	-
CI115	Adzopé	South	28/08/2013	06°02'22.65"N	03°54'18.69"W	-

¹Each sample corresponds to a distinct leaf from a different plant
²Degenerate primers designed to detect monopartite begomoviruses: Chast4CP-F342/Chast4CP-R1032
³PepYVMLV-[Cote d'Ivoire:Toumodi:CI29:2012]; GenBank Accession No. KY271075
⁴PepYVMLV-[Cote d'Ivoire:Toumodi:CI30:2012]; GenBank Accession No. KY271076
⁵PepYVMLV-[Cote d'Ivoire:Korhogo:CI57:2012]; GenBank Accession No. KY271075

Figure 3

To cite this report: Séka K, Ouattara A, Assiri KP, Kra KD, Hoareau M, Lefeuvre P, Atta Diallo H, Lett JM, 2017. First report of *Pepper yellow vein Mali virus* associated with pepper yellow vein disease in Cote d'Ivoire. *New Disease Reports* 35, 11.

<http://dx.doi.org/10.5197/j.2044-0588.2017.035.011>

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