

Symptomless banana plants and other species as reservoir for BBTV inoculum

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INTRODUCTION

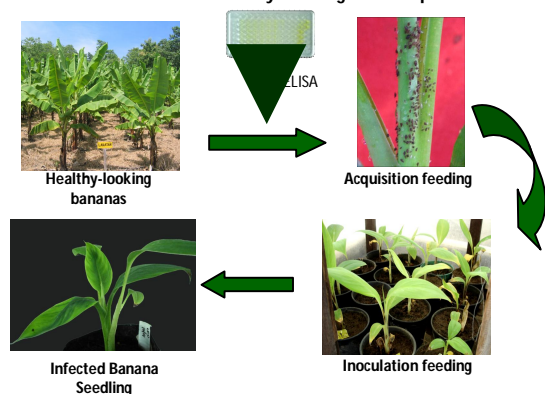
Banana bunchy top virus (BBTV), the cause of banana bunchy top disease (BBTD), is the most important virus affecting banana production. BBTV can persist naturally in banana plants causing no apparent symptoms of the disease or the plants remain healthy-looking and asymptomatic. Furthermore, it has been experimentally proven that there are alternate hosts of BBTV outside *Musaceae* family. These healthy-looking banana plants and alternate hosts can have an important role on the spread of BBTD by acting and serving as a reservoir of BBTV.

OBJECTIVE

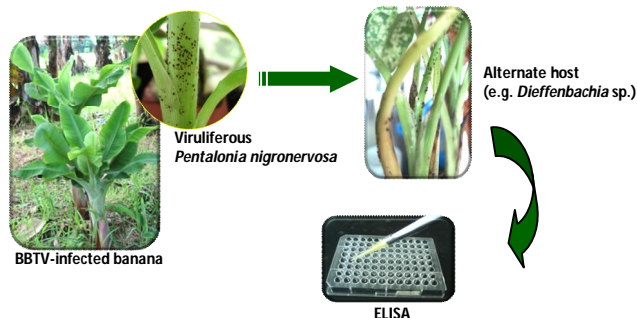
To determine the important role of healthy-looking banana and alternate hosts in the spread of banana bunchy top disease (BBTD).

METHODOLOGY

A. Insect transmission of healthy-looking banana plants



B. Insect transmission of BBTV to alternate hosts



B. Insect transmission of BBTV to alternate hosts

Initial studies, based on insect transmission and ELISA, show three possible and potential plant reservoir of BBTV outside *Musaceae* family.

Scientific Name	No. test plants *	Symptomatic ** (%)	* Symptoms
<i>Caladium bicolor</i>	16	6	(6) Marginal chlorosis
<i>Canna</i> sp.	16	0	31 Symptomless
<i>Colocasia esculenta</i>	20	0	10 Symptomless
<i>Costus</i> sp.	4	0	0 Symptomless
<i>Dieffenbachia</i> sp.	4	0	0 Symptomless
<i>Hedychium coronarium</i>	19	0	0 Symptomless
<i>Heliconia</i> sp.	6	16	50 Marginal chlorosis
<i>Zingiber officinale</i>	2	0	0 Symptomless
<i>Amorphophallus campanulatus</i>	5	0	0 Symptomless
Weeds (4 species)	20	0	0 Symptomless
<i>Synedrella nodiflora</i>	7		
<i>Achyranthus aspera</i>	6		
unidentified	4		
unidentified	3		

* Samples collected ranged from 10 to 20 plants per species, but mortality was very high under greenhouse condition

** Number of symptomatic / total number of insect-transmitted plants

*** Number of detected positive / total number of plants assayed

RESULTS

A. Insect transmission of healthy-looking banana plants



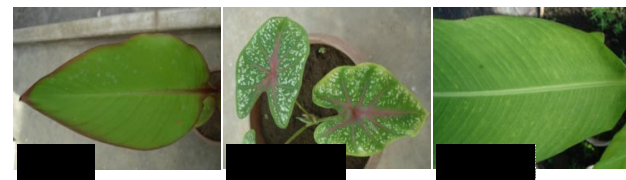
Figure 1. BBTV infection 3-4 weeks after insect transmission.

Characteristic symptoms of BBTV infection are marginal chlorosis, leaf narrowing & reduction in surface area, rosetting & bunchy top.

Table 1. Results of insect transmission of healthy-looking banana to tissue-cultured Lakatan.

Place of Collection	Cultivar name	Genome	ELISA	% Aphid Transmission
Bay, Laguna	Bungulan	AAA	+	(-)
	Lakatan 1	AAA	+	(-)
	Lakatan 2	AAA	+	+
	Lakatan 3	AAA	(-)	(-)
	Latundan	AAB	(-)	(-)
Sta. Cruz, Laguna	Latundan Puti	AAB	+	(-)
	Saba	BBB	+	(-)
Pagsanjan, Laguna	Lakatan	AAA	+	+
	Latundan	AAB	(-)	(-)
	Saba	BBB	+	+
Quezon	Saba	BBB	+	(-)
Cavite	Bungulan	AAA	+	+
	Saba	BBB	(-)	(-)
	Dwarf Cavendish	AAA	(-)	(-)
	Latundan	AAB	(-)	(-)
Batangas	Saba	BBB	(-)	(-)
	Bungulan	AAA	+	+
	Unknown		+	(-)

- ▶ ELISA & insect transmission results indicate the presence of BBTV from healthy-looking plants and that the virus can be transferred to other plants, respectively.
- ▶ Negative to ELISA and insect transmission could be due to low titer of the virus and efficiency of transmission.



Marginal chlorosis started to appear 4 weeks post-insect transmission only on *Caladium bicolor* and *Heliconia* sp., while *Canna* sp. remained asymptomatic.

CONCLUSION

Asymptomatic & apparently healthy-looking banana plants & other alternate hosts outside *Musaceae* family can act as reservoir to BBTV and can serve as foci of infection on the spread of BBTD.

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