

Validation Report: PCR Primers

PCR 95100 • *Tobamovirus* group (Tobamo)



Test Characteristics

Test Name	Tobamovirus group	Format	RT-PCR Primers
Catalog Number	95100	Extraction Method	Nucleic acid extraction
Acronym	Tobamo		
Genus	Tobamovirus		

Summary

The Tobamovirus Group PCR primers offer a sensitive diagnostic method to detect members of the Tobamovirus genus of the Virgaviridae family. The primer sequences are based on conserved genome regions and can detect characterized and unassigned members of the Tobamovirus genus.

Diagnostic Sensitivity

True Positives	4276
Correct Diagnoses	4276
Percent	100%

Analytical Specificity

Inclusivity:

Tobamoviruses¹ Detected:

Abutilon yellow mosaic virus (AbYMV) ^{2,3}	African eggplant-associated virus (AEaV)
Bell pepper mottle virus (BPeMV)	Brugmansia mild mottle virus (BrMMV) ²
Cactus mild mottle virus (CMMoV) ²	Chili pepper mild mottle virus (CPMMoV) ⁴
Clitoria yellow mottle virus (CliYMMV) ²	Cucumber fruit mottle mosaic virus (CFMMV) ²
Cucumber green mottle mosaic virus (CGMMV)	Cucumber mottle virus (CuMoV) ²
Hibiscus latent Fort Pierce virus (HLFPV) ²	Hibiscus latent Singapore virus (HLSV) ²
Hoya chlorotic spot virus (HoCSV) ^{2,3}	Kyuri green mild mottle virus (KGMMV)
Maracuja mosaic virus (MarMV) ²	Obuda pepper virus (OBPV)
Odontoglossum ringspot virus (ORSV)	Paprika mild mottle virus (PaMMV)
Passion fruit mosaic virus (PafMV) ²	Pepper mild mottle virus (PMMoV)
Piper chlorosis virus (PChV) ⁵	Plumeria mosaic virus (PluMV) ²
Rattail cactus necrosis-associated virus (RCNAV) ²	Rehmannia mosaic virus (ReMV)
Ribgrass mosaic virus (RMV)	Streptocarpus flower break virus (SFBV) ²
Sunn-hemp mosaic virus (SHMV)	Tobacco mild green mosaic virus (TMGMV)
Tobacco mosaic virus (TMV)	Tomato brown rugose fruit virus (ToBRFV)
Tomato mosaic virus (ToMV)	Tomato mottle mosaic virus (ToMMV)
Tropical soda apple mosaic virus (TSAMV)	Turnip vein clearing virus (TVCV)



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Tobamoviruses¹ Detected:

Wasabi mottle virus (WMoV) ²	Watermelon green mottle mosaic virus (WGMMV) ^{2,6}
Yellow tailflower mild mottle virus (YTMMV)	Youcai mosaic virus (YoMV)
Zucchini green mottle mosaic virus (ZGMMV)	
¹ The list above represents viruses that have been shown to be detected by this group PCR test. It also represents viruses that may be detected based on <i>in silico</i> analysis. If you have confirmed detection of a predicted virus detection or a virus not on this list, please contact us. We would like to work with you to further validate detection capabilities.	
² Predicted detection by <i>in silico</i> analysis only	
³ Described by ICTV as a related, unclassified Tobamovirus	
⁴ Confirmed to detect Chili pepper mild mottle virus (CPMMoV) , a possible novel Tobamovirus.	
⁵ Confirmed to detect Piper chlorosis virus (PChV) , a possible novel Tobamovirus.	
⁶ Predicted to detect Watermelon green mottle mosaic virus (WGMMV) , a possible novel Tobamovirus.	

Tobamoviruses Not Detected:

Frangipani mosaic virus (FrMV)	
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Exclusivity:**Cross-reacts With:**

None known	
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Diagnostic Specificity

True Negatives 3508
 Correct Diagnoses 3508
 Percent 100%

Selectivity:

No Matrix Effect Observed With:			
Beet leaves	Chenopodium leaves	Cucumber leaves	Kyuri leaves
Paprika leaves	Pepper leaves	Petunia leaves	Plantain leaves
Ribgrass leaves	Sunn-hemp leaves	Tobacco leaves	Tomato leaves
Turnip leaves	Zinnia leaves	Zucchini leaves	



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Glossary

Diagnostic sensitivity¹:	The percentage of positive samples correctly identified in an experiment with known positive controls.
Diagnostic specificity¹:	The percentage of negative samples correctly identified in an experiment with known negative controls.
Analytical sensitivity²:	The smallest amount of target that can be detected reliably (this is sometimes referred to as the 'limit of detection')
Analytical specificity²:	(comprises inclusivity and exclusivity)
Inclusivity³:	The performance of a test with a range of target isolates covering genetic diversity, different geographical origin and/or hosts associated with the target organism.
Exclusivity²:	The performance of a test with a range of non-targets (e.g. cross-reaction with closely related organisms, contaminants)
Selectivity²:	The level of effect that matrices and relevant plant parts have on the performance of the assay.
Repeatability²:	The agreement between test replicates of the same sample tested by the same operator.
Reproducibility³:	The ability of a test to provide consistent results when applied to aliquots of the same sample tested under different conditions (e.g. time, users, equipment, location)
Robustness^{1,3}:	The extent to which varying test conditions (e.g. temperature, volume, change of buffers) affect the established test performance values. May also be referred to as planned deviation analysis.
Stability¹:	The performance of test reagents or controls over time.

References:

¹Groth-Helms, D., Rivera, Y., Martin, F. N., Arif, M., Sharma, P., Castlebury, L. A. (in press). Terminology and Guidelines for Diagnostic Assay Development and Validation: Best Practices for Molecular Tests. *PhytoFrontiers*.

²Eads, A., Groth-Helms, D., Davenport, B., Cha, X., Li, R., Walsh, C., Schuetz, K., (in press). The Commercial Validation of Three Tomato Brown Rugose Fruit Virus Assays. *PhytoFrontiers*.

³EPPO (2018) PM 7/76 (5) Use of EPPO Diagnostic Standards, EPPO Bulletin 48, 373– 377.



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