AmplifyRP® XRT for ToMMV
Validation Report
Tomato mottle mosaic virus
Product No. XCS 22800

Test Characteristics

Test Name	Tomato mottle mosaic virus	**Test Label**	FAM-labeled target probe
Catalog Number	22800	**Internal Control**	N/A
Acronym	ToMMV	**Format**	XRT
Genus	Tobamovirus	**Diluents**	GEB2/PD1
		Sample Dilution	1:20

Summary

AmplifyRP XRT for ToMMV is a rapid RNA amplification and detection platform designed for testing peppers and tomatoes for Tomato mottle mosaic virus. This kit includes lyophilized reaction pellets containing the necessary reagents to amplify ToMMV RNA at a single operating temperature (42 °C).

Diagnostic Sensitivity

True Positives	46
Correct Diagnoses	46
Percent	100%

Analytical Sensitivity

Limit of Detection: Approximately 400 ag/µL of RNA transcripts

Limit of Detection: 1:62,500 dilution of infected tissue (pathogen titer unknown)

Analytical Specificity

Inclusivity:

Isolates and Geographic Regions Detected:

ToMMV PV-1267 (CA, USA)	ToMMV PV-1342 (Mauritius)[1]
ToMMV-10-100 (FL, USA)[1]	ToMMV-19-02305 (Netherlands)[1]
ToMMV-CA16-01 (USA)[1]	ToMMV-CpB1 (Brazil)[1]
ToMMV-Hainan (China)[1]	ToMMV-HN (China)[1]
ToMMV-Hn18 (China)[1]	ToMMV-Hn19 (China)[1]
ToMMV-Hn23 (China)[1]	ToMMV-LN (China)[1]
ToMMV-MX5 (Mexico)	ToMMV-NVWA 36783676 (Netherlands)[1]
ToMMV-NVWA36783860 (China)[1]	ToMMV-NVWA41106813[1]
ToMMV-NVWA5785660[1]	ToMMV-NY-13 (USA)[1]
ToMMV-SC13-05 (USA)[1]	ToMMV-SY11026 (China)[1]
ToMMV-TiLhaLJ (China)[1]	ToMMV-ToMMV_83 (Viet Nam)[1]
ToMMV-VLC-1 (Spain)[1]	ToMMV-WD-YMZ1 (China)[1]
ToMMV-YYMFQ12 (China)[1]	ToMMV-YYMLJ (China)[1]
[1]Predicted detection by *in silico* analysis only	

Exclusivity:

Cross-reacts With:

None Known	

Does Not Cross-react With:

African eggplant-associated virus (AEaV)[2]	Bell pepper mottle virus (BPeMV)
Brugmansia mild mottle virus (BrMMV)[1]	Cactus mild mottle virus (CMMoV)[1]
Clavibacter michiganensis subsp. michiganensis (Cmm)	Clitoria yellow mottle virus (CliYMV)[1]
Cucumber fruit mottle mosaic virus (CFMMV)[1]	Cucumber green mottle mosaic virus (CGMMV)
Cucumber mottle virus (CMoV)[1]	Frangipani mosaic virus (FrMV)
Hibiscus latent Fort Pierce virus (HLFPV)[1]	Hibiscus latent Singapore virus (HLSV)[1]
Kyuri green mottle mosaic virus (KGMMV)[1]	Maracuja mosaic virus (MarMV)[1]
Obuda pepper virus (ObPV)[1]	Odontoglossum ringspot virus (ORSV)[1]
Paprika mild mottle virus (PaMMV)[1]	Passion fruit mosaic virus (PFMV)[1]
Pepino mosaic virus (PepMV)	Pepper mild mottle virus (PMMoV)[1]
Plumeria mosaic virus (PluMV)[1]	Rattail cactus necrosis-associated virus (RCNaV)[1]
Rehmannia mosaic virus (RheMV)	Ribgrass mosaic virus (RMV)[1]
Sammons's Opuntia virus (SOV)[1]	Streptocarpus flower break virus (SFBV)[1]
Sunn-hemp mosaic virus (SHMV)[1]	Tobacco latent virus (TLV1)[1]
Tobacco mild green mosaic virus (TMGMV)	Tobacco mosaic virus (TMV)
Tomato brown rugose fruit virus (ToBRFV)	Tomato chlorosis virus (ToCV)[1]
Tomato infectious chlorosis virus (TICV)[1]	Tomato leaf curl New Delhi virus (ToLCNDV)[1]
Tomato mosaic virus (ToMV)	Tomato yellow leaf curl virus (TYLCV)[1]
Tropical soda apple mosaic virus (TSAMV)[1]	Turnip vein-clearing virus (TVCV)[1]
Ullucus mild mottle virus (UMMV)[1]	Wasabi mottle virus (WMoV)[1]
Yellow tailflower mild mottle virus (YTMMV)[1]	Youcai mosaic virus (YoMV)[1]
Zucchini green mottle mosaic virus (ZGMMV)	
[1]Predicted non-detection by *in silico* analysis only	
[2]African eggplant-associated virus (AEaV) has been reported to be a possible novel Tobamovirus.	

Diagnostic Specificity

True Negatives	79
Correct Diagnoses	79
Percent	100%

Selectivity:

No Matrix Effect Observed With:			
Pea leaves	Pea petioles	Pea seeds	Pea stems
Pepper fruit	Pepper leaves	Pepper petioles	Pepper seeds
Pepper stems	Petunia leaves	Petunia petioles	Petunia stems
Tomato fruit	Tomato leaves	Tomato petioles	Tomato seeds
Tomato stems			

Repeatability

Number of Samples	22
Replicates per Sample	3
Average Percent Agreement Between Replicates	97.0%

Reproducibility

Number of Samples	22
Replicates per Sample	3
Number of Operators	3
Average Percent Agreement Between Replicates Between Operators	97.0%

Glossary

Diagnostic sensitivity[1]:	The percentage of positive samples correctly identified in an experiment with known positive controls.
Diagnostic specificity[1]:	The percentage of negative samples correctly identified in an experiment with known negative controls.
Analytical sensitivity[3]:	The smallest amount of target that can be detected reliably (this is sometimes referred to as the 'limit of detection')
Analytical specificity[3]:	(comprises inclusivity and exclusivity)
Inclusivity[3]:	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.
Exclusivity[3]:	The performance of a test with a range of non-targets (e.g. cross-reaction with closely related organisms, contaminants)
Selectivity[2]:	The level of effect that matrices and relevant plant parts have on the performance of the assay.
Repeatability[2]:	The agreement between test replicates of the same sample tested by the same operator.
Reproducibility[3]:	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.
Stability[1]:	The performance of test reagents or controls over time.

References:

[1]Groth-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.
[2]Eads, 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.
[3]EPPO (2018) PM 7/76 (5) Use of EPPO Diagnostic Standards, EPPO Bulletin 48, 373– 377.

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