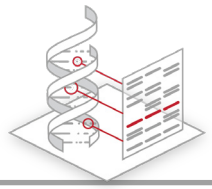
# Validation Report: PCR Primers

PCR 94000 • Carmovirus-Pelarspovirus Group (Carmo-Pelarspo)



## Test Characteristics

**Test Name** Carmovirus-Pelarspovirus Group
**Catalog Number** 94000
**Acronym** Carmo-Pelarspo
**Genus** Carmovirus/Pelarspovirus
**Format** RT-PCR Primers
**Extraction Method** Nucleic acid extraction

## Summary

The Carmovirus-Pelarspovirus Group PCR primers offer a sensitive diagnostic method to detect members of the Alphacarmovirus, Betacarmovirus, Gammacarmovirus, and Pelarspovirus genera of the Tombusviridae family. The primer sequences are based on conserved genome regions and can detect characterized and unassigned members of the Alphacarmovirus, Betacarmovirus, Gammacarmovirus, and Pelarspovirus genera.

## Diagnostic Sensitivity

**True Positives** 1097
**Correct Diagnoses** 1097
**Percent** 100%

## Analytical Specificity

### Inclusivity:

**Carmoviruses/Pelarspoviruses[1] Detected:**

| Virus Name | Species Name |
|---|---|
| Angelonia flower break virus (AnFBV) | Alphacarmovirus angeloniae |
| Calibrachoa mottle virus (CbMV) | Alphacarmovirus calibrachoae |
| Cardamine chlorotic fleck virus (CCFV) | Betacarmovirus cardaminis |
| Carnation mottle virus (CarMV) | Alphacarmovirus dianthi |
| Clematis chlorotic mottle virus (ClCMV) | Pelarspovirus clematis |
| Cowpea mottle virus (CPMoV) | Gammacarmovirus vignae |
| Elderberry latent virus (ELV) | Pelarspovirus sambuci |
| Hibiscus chlorotic ringspot virus (HCRSV) | Betacarmovirus hibisci |
| Honeysuckle ringspot virus (HRSV)[2] | Alphacarmovirus lonicerae |
| Japanese iris necrotic ring virus (JINRV)[2] | Betacarmovirus iridis |
| Melon necrotic spot virus (MNSV) | Gammacarmovirus melonis |
| Nootka lupine vein clearing virus (NLVCV)[2] | Alphacarmovirus lupini |
| Pea stem necrosis virus (PSNV)[2] | Gammacarmovirus pisi |
| Pelargonium chlorotic ring pattern virus (PCRPV) | Pelarspovirus chloropelargonii |

Agdia, Inc.
52642 County Road 1
Elkhart, IN 46514
574-264-2014 / 800-622-4342
www.agdia.com / info@agdia.com

**Carmoviruses/Pelarspoviruses[1] Detected:**

| Virus Name | Species Name |
|---|---|
| Pelargonium flower break virus (PFBV) | Alphacarmovirus pelargonii |
| Pelargonium line pattern virus (PLPV) | Pelarspovirus lineapelargonii |
| Pelargonium ringspot virus (PelRSV) | Pelarspovirus anulopelargonii |
| Rosa rugosa leaf distortion virus (RRLDV)[2] | Pelarspovirus rosae |
| Saguaro cactus virus (SgCV) | Alphacarmovirus cacti |
| Soybean yellow mottle mosaic virus (SYMMV)[2] | Gammacarmovirus glycinis |
| Turnip crinkle virus (TCV) | Betacarmovirus brassicae |
| [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 *in silico* 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 *in silico* analysis only | |

**Carmoviruses/Pelarspoviruses Not Detected:**

| Virus Name | Species Name |
|---|---|
| None Known | |

## Exclusivity:

**Cross-reacts With:**

| Virus Name | Species Name |
|---|---|
| Galinsoga mosaic virus (GAMV)[1] | Gallantivirus galinsogae |
| Maize chlorotic mottle virus (MCMV) | Machlomovirus zeae |
| Tobacco necrosis virus A (TNV-A) | Alphanecrovirus nicotianae |
| Trailing lespedeza virus 1 (TLV1)[1] | Tralespevirus lespedezae |
| [1]Predicted detection by *in silico* analysis only | |

**Does Not Cross-react With:**

| Virus Name | Species Name |
|---|---|
| None Known | |

## Diagnostic Specificity

| | |
|---|---|
| **True Negatives** | 12159 |
| **Correct Diagnoses** | 12159 |
| **Percent** | 100% |

## Selectivity:

| No Matrix Effect Observed With: | | | |
|---|---|---|---|
| Achillea leaves | Agapanthus leaves | Alstroemeria leaves | Angelonia leaves |
| Aster leaves | Astilbe leaves | Astilbe roots | Buddleia leaves |
| Carnation leaves | Clematis leaves | Colocasia leaves | Colocasia roots |
| Coreopsis leaves | Crisantemo leaves | Dahlia leaves | Delphinium leaves |
| Dianthus leaves | Dieffenbachia leaves | Echinacea leaves | Epimedium leaves |

| | | | |
|---|---|---|---|
| Gaillardia leaves | Geranium leaves | Gypsophila leaves | Hemp leaves |
| Hibiscus leaves | Leucanthemum leaves | Mandevilla leaves | Melon seeds |
| Osteospermum leaves | Palm leaves | Pelargonium leaves | Phlox leaves |
| Scabiosa leaves | Schlumbergera leaves | Sedum leaves | Syngonium leaves |
| Syngonium roots | Thymus leaves | Tobacco leaves | Tradescantia leaves |
| Verbena leaves | Veronica leaves | | |
| The hosts on the above list have been chosen to represent those which historically cause a range of matrix effects, in addition to those expected to be screened for this pathogen. Not all plant species susceptible to this pathogen have been screened, but may still be used with this assay unless otherwise noted below. As with all diagnostic tools, Agdia recommends confirming all results with a secondary detection method before making any economic decisions (ex: discarding plants due to positive test results, etc.). | | | |

| **Matrix Effect Observed With:** | | | |
|---|---|---|---|
| None Known | | | |

## Robustness

**Planned deviation analysis:**
No deviations from the user guide protocol were validated.

**Stability:**

| | 1-year stability (accelerated) | Real-time Stability Verification |
|---|---|---|
| Positive Sample (High) | Pass | Monitoring |
| Positive Sample (High) | Pass | Monitoring |
| Positive Sample (Low) | Pass | Monitoring |
| Positive Sample (Low) | Pass | Monitoring |
| Positive Sample (Low) | Pass | Monitoring |
| Negative Sample | Pass | Monitoring |
| Negative Sample | Pass | Monitoring |
| Negative Sample | Pass | Monitoring |

## 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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