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Comparative Analysis of GenieColor Mycoplasma Detection Kit Sensitivity, Specificity, and Reliability

Product: GenieColor Mycoplasma Detection Kit (MORV0013) | **Author:** Miren Ruiz de Eguilaz PhD

Introduction

Mycoplasma is the name of a group of small bacteria that are well-know for contamination cell cultures in laboratory settings. Mycoplasma contamination can be persistent and can occur through different routes (e.g., contaminated cell lines, reagents, equipment or personnel). In fact, these bacteria have the ability to pass through the filter used for bacteria decontamination, which poses a high risk for laboratory cell cultures. Additionally, their contamination with Mycoplasma can go undetected using conventional visual techniques such as microscopy (1).

Currently, methods to detect Mycoplasma include Quantitative PCR (qPCR) and luminescent-based approaches (2). These techniques are unsuitable for many laboratories since they require multiple steps and specialized equipment, which can raise significant challenges for cell culture scientists.

However, the GenieColor Mycoplasma Detection Kit is a rapid, one-step colorimetric assay designed to detect mycoplasma contamination with high accuracy and minimal equipment requirements.

Figure 1. GenieColor Mycoplasma Detection Kit results interpretation, If Mycoplasma DNA is present, reagent colour changes from pink to yellow

By leveraging LAMP-based amplification and visual color change (**Figure 1**), GenieColor provides a fast and user-friendly alternative to conventional methods. This note summarizes performance of GenieColor in contaminated samples.

Purpose

The purpose of this study was to evaluate the performance of the GenieColor Mycoplasma Detection. The evaluation focused on detection sensitivity, specificity, and contamination resistance across multiple mycoplasma species and real cell culture samples.

Methodology

- Samples: Plasmids and cell culture supernatants containing fragments of mycoplasma genomes.
- Evaluation Metrics: Detection sensitivity, specificity against non-mycoplasma templates, and contamination resistance.

Key Findings

Comprehensive Species Detection

Plasmids containing different species mycoplasma genome fragments were tested GenieColor Mycoplasma Detection Kit. Species included were M. hyorhinis, M. fermentans, M. arginini, M. hominis, M. orale, M. salivarium, M. pirum, Acholeplasma laidlawii, and M. pneumoniae (**Figure 2**).

Validation Data

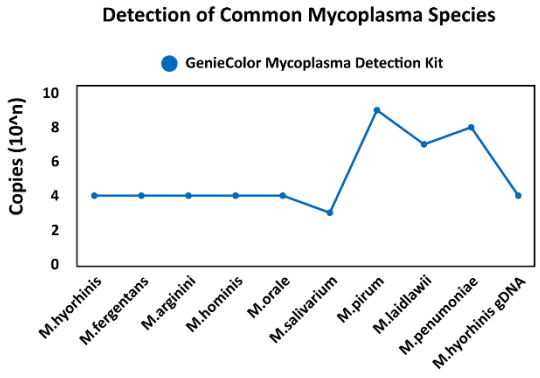

Figure 2. Detection of common mycoplasma species performed by GenieColor Mycoplasma Detection Kit (dark blue),. Values for mycoplasma genome copies were benchmarked with qPCR technique.

Excellent Specificity

To evaluate the specificity, genomic fragments belonging to different species (M. hornis, E.coli, S. Aureus, 293 cells and Mus) were tested. As shown in **Figure 3**, GenieColor displayed high specificity with no cross-reactivity with E. coli, S. aureus, 293 cells, or mouse DNA. No false positives were observed for Negative Control Sample (NTC).

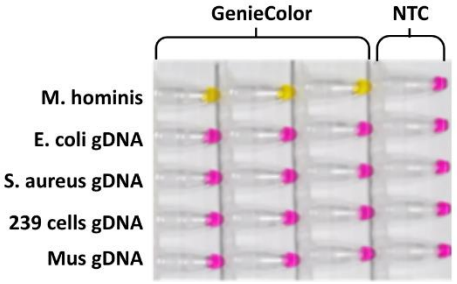

Figure 3. Cross-reactivity test results for GenieColor samples contaminated with M.hominis, E.coli gDNA, S.aureus gDNA, 239 cells gDNA and Mus gDNA.

Specificity was further investigated by obtaining the Ct values using qPCR technique. Additionally, 10 fg of a LAMP product (i.e., DNA Polymerase Large Fragment) was also tested with the same samples. The results showed that GenieColor amplification products were detected exclusively in samples containing *M. hominis* DNA (**Figure 4**).

No LAMP products were observed in samples containing *S. aureus*, 293, or *Mus* genomic DNA, confirming the high specificity of the GenieColor Mycoplasma Detection Kit.

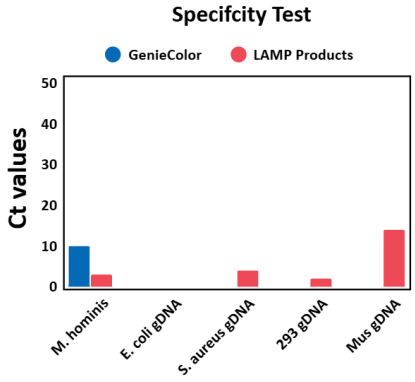

Figure 4. Specificity test results for GenieColor, and LAMP Amplification Products with samples contaminated with M.hominis, E.coli gDNA, S.aureus gDNA, 239 cells gDNA and Mus gDNA. Ct values were achieved with qPCR technique.

Real-World Reliability

Assessment of the GenieColor performance with cell cultures was carried out with 2 different human-derived adherent cell cultures: Vero Cells and U373 cells. In total, six mycoplasma contaminated cell cultures were tested (**Figure 5**).

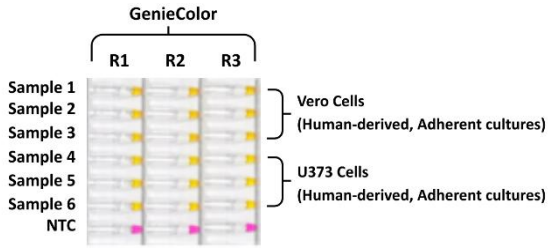

Figure 5. Test results for GenieColor Mycoplasma Detection Kit with Vero cell culture (samples 1,2 and 3) and U373 cell cultures (samples 4,5 and 6). Replicates per sample (n=3).

Mycoplasma was detected in all six cell culture fluid samples with no false positives for Negative Controls. These results highlighted the excellent reliability GenieColor Mycoplasma detection kit and it's computability with real-world samples.

Validation Data

Conclusion

Assay Genie's GenieColor Mycoplasma Detection Kit showed outstanding performance and results confirmed it's high sensitivity, broad species coverage, and contamination resistance features. GenieColor is a reliable choice for routine mycoplasma screening in cell culture facilities.

References

1. Huang, X., Yu, M., Wang, B., Zhang, Y., Xue, J., Fu, Y., & Wang, X. (2023). Prevention, diagnosis and eradication of mycoplasma contamination in cell culture. *Journal of Biological Methods*, *10*, e99010005.
2. Morris, C., Lee, Y. S., & Yoon, S. (2021). Adventitious agent detection methods in bio-pharmaceutical applications with a focus on viruses, bacteria, and mycoplasma. Current Opinion in Biotechnology, 71, 105-114.

SKU Code	Product	Size
MORV0013-25	GenieColor Mycoplasma Detection Kit	25 Tests
MORV0013-50	GenieColor Mycoplasma Detection Kit	50 Tests

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25 Windsor Pl, Dublin 2, D02 VY42, Ireland