Plant Pathology Seminar Series

Early detection of major quarantine postharvest pathogens of apple and pear in the U.S. Pacific Northwest

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Abstract:

The postharvest pathogens *Phacidiopycnis washingtonensis*, *Phacidiopycnis pyri*, *Sphaeropsis pyriputrescens*, and *Neofabraea* spp. are important quarantine pathogens of apple and pear from the U.S Pacific Northwest. These pathogens can threaten the pome fruit export from the region and because their morphology is similar, a molecular diagnostic assay based on loop-mediated isothermal amplification (LAMP) is being developed for each pathogen. LAMP method is highly specific, sensitive, rapid, and can be used for point-of-care detection. The aims of this study are to develop and optimize the LAMP primers of four mentioned pathogens, and validate their specificity and sensitivity on fruit from commercial orchards and warehouses. The designed LAMP primers targeting the *β-tubulin* gene are specific to detect genomic DNA of *Phacidiopycnis washingtonensis*, *P. pyri*, *Sphaeropsis pyriputrescens*, and *Neofabraea alba* in 15 minutes by measuring the fluorescence. To confirm the specificity, all respective primer sets are also tested against several common pome fruit fungal pathogens, i.e., *Neonectria*, *Botrytis*, and *Alternaria*. Once developed, we hope that the LAMP assays will enable faster and efficient detection to prevent significant economic loses and ease exports.

References:

Enicks, D. A., et al. (2020). "Development of a Portable LAMP Assay for Detection of *Neofabraea perennans* in Commercial Apple Fruit." Plant Disease **104**: 2346-2353.

Notomi, T., et al. (2000). "Loop-mediated isothermal amplification of DNA." Nucleic Acids Research **28**: e63.

Tomita, N., et al. (2008). "Loop-mediated isothermal amplification (LAMP) of gene sequences and simple visual detection of products." Nature Protocol **3**: 877-882.

4:10 pm | May 1, 2023 | Plant Pathology 515, Spring 2023

Zoom Link: https://wsu.zoom.us/j/95501196325?pwd=aGdCeTZGM0pQaXZoY05qT3M0SFVHQT09

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