

INTRODUCTION

Foliar fungal endophytes, a category of fungi, reside within the leaf tissue of plants. These endophytes establish colonies within the inner layers of the leaf and engage in a nonpathogenic symbiotic association. Certain endophytes have demonstrated their significance in influencing leaf biochemistry, affording protection against herbivores and pathogens.

The acquisition of endophytes can occur through either vertical or horizontal transmission. In the case of horizontal transmission, endophytes can be obtained from the surrounding environment or through direct contact with other plant materials. On the other hand, vertical transmission involves the acquisition of endophytes from the maternal plant via the seed.

PURPOSE

This experiment and study will play a crucial role in shaping the methodology of an upcoming manipulative field experiment scheduled to take place in the Cobián lab this coming fall. The objective of the experiment is to examine the priority effects of foliar fungal endophytes on the process of leaf litter decomposition. Priority effects, in the context of fungal endophytes, revolve around the sequence in which different species colonize the leaf post-abscission.

The insights gleaned from the current study will serve as a guide in refining our sterilization procedures for the priority effects project slated for implementation in the fall season.

QUESTION

What is the lowest temperature and time needed to completely sterilize leaves?

METHODS

Field Methodology:



Figure 1a: The figure on the right shows the first part of this research, my team and I at Big Chico Creek Ecological Reserve cutting leaves off the Valley Oak species.

Lab Methodology:

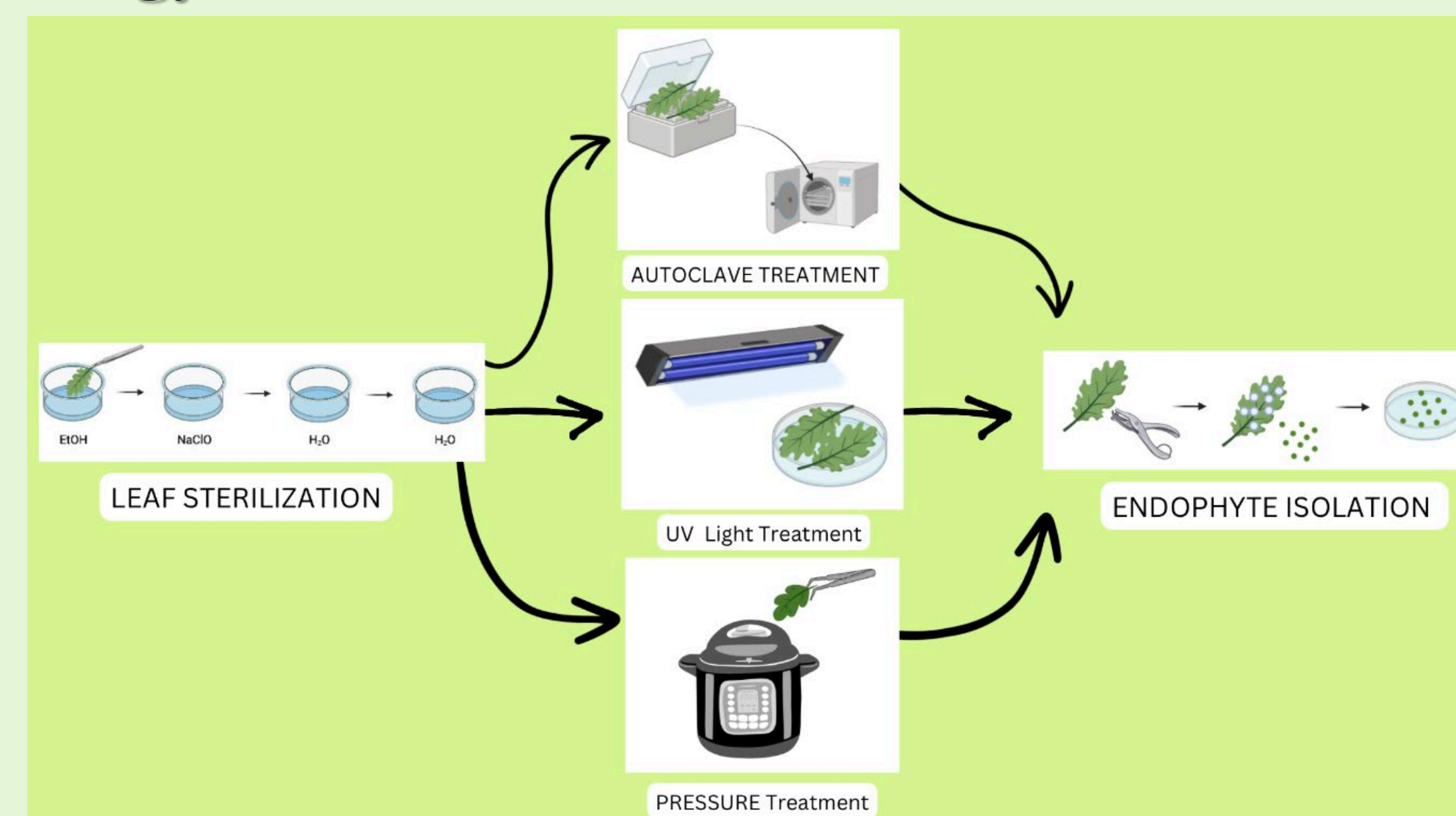
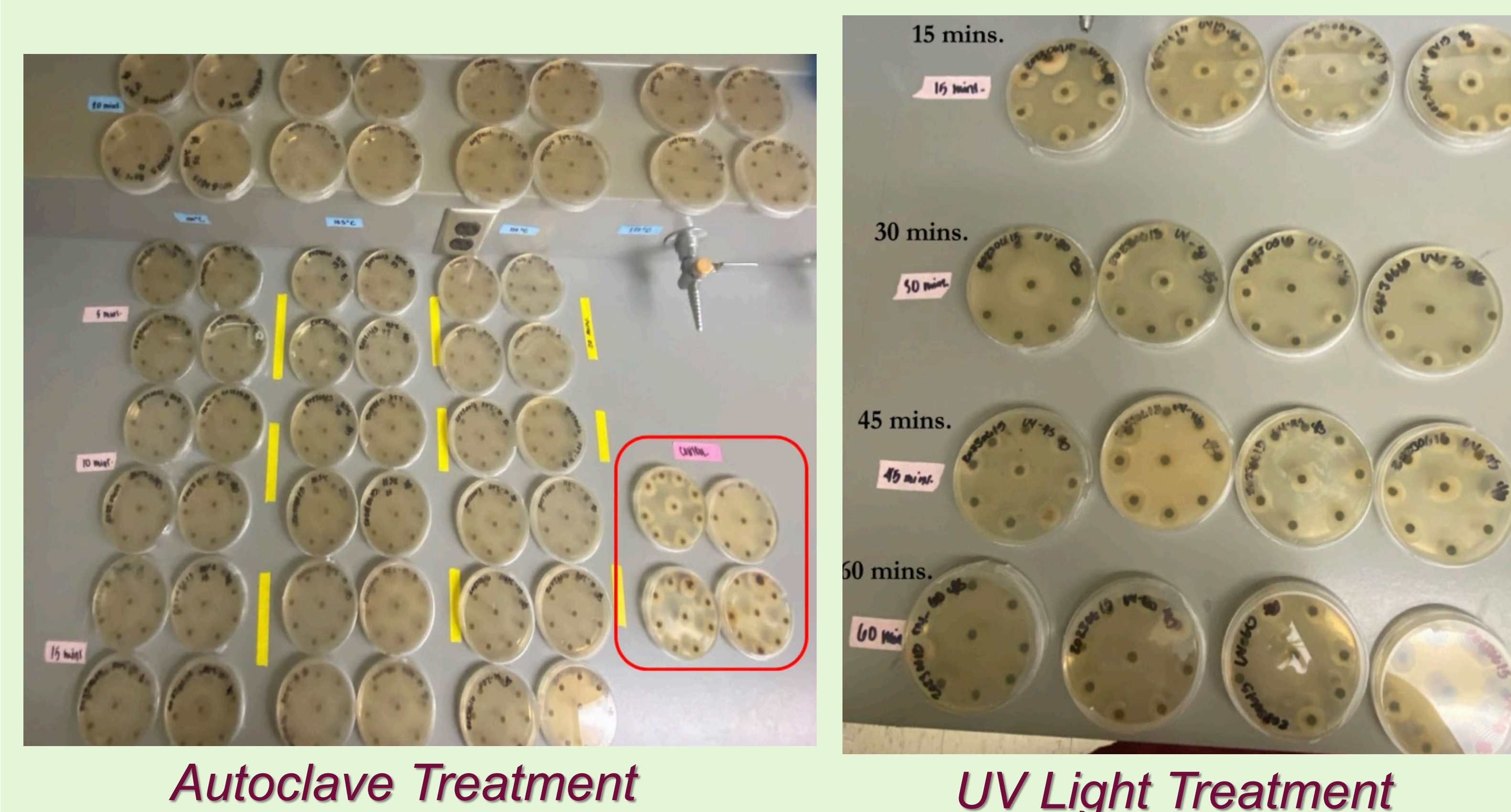
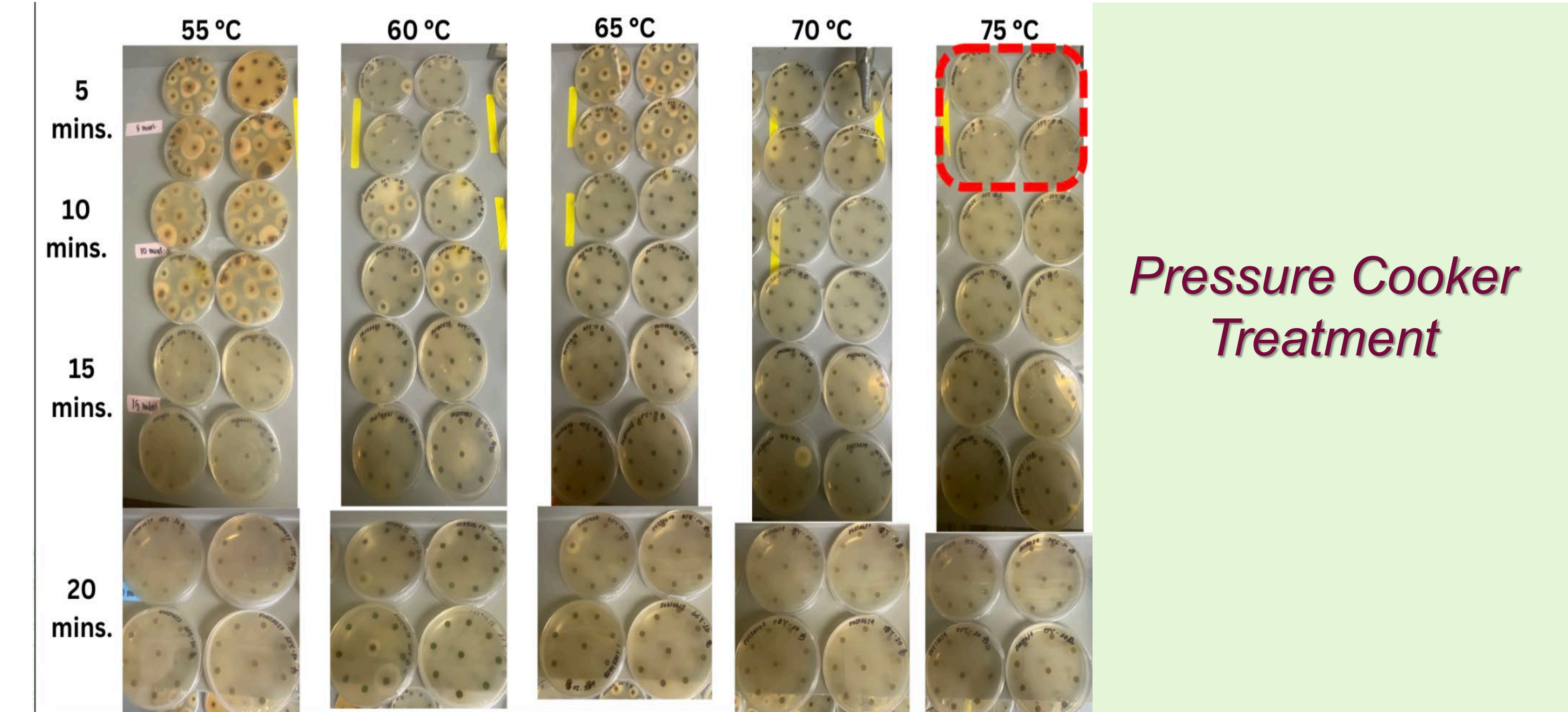


Figure 1b: The figure on the right shows the process of isolation the fungal endophytes within the leaf.

RESULTS

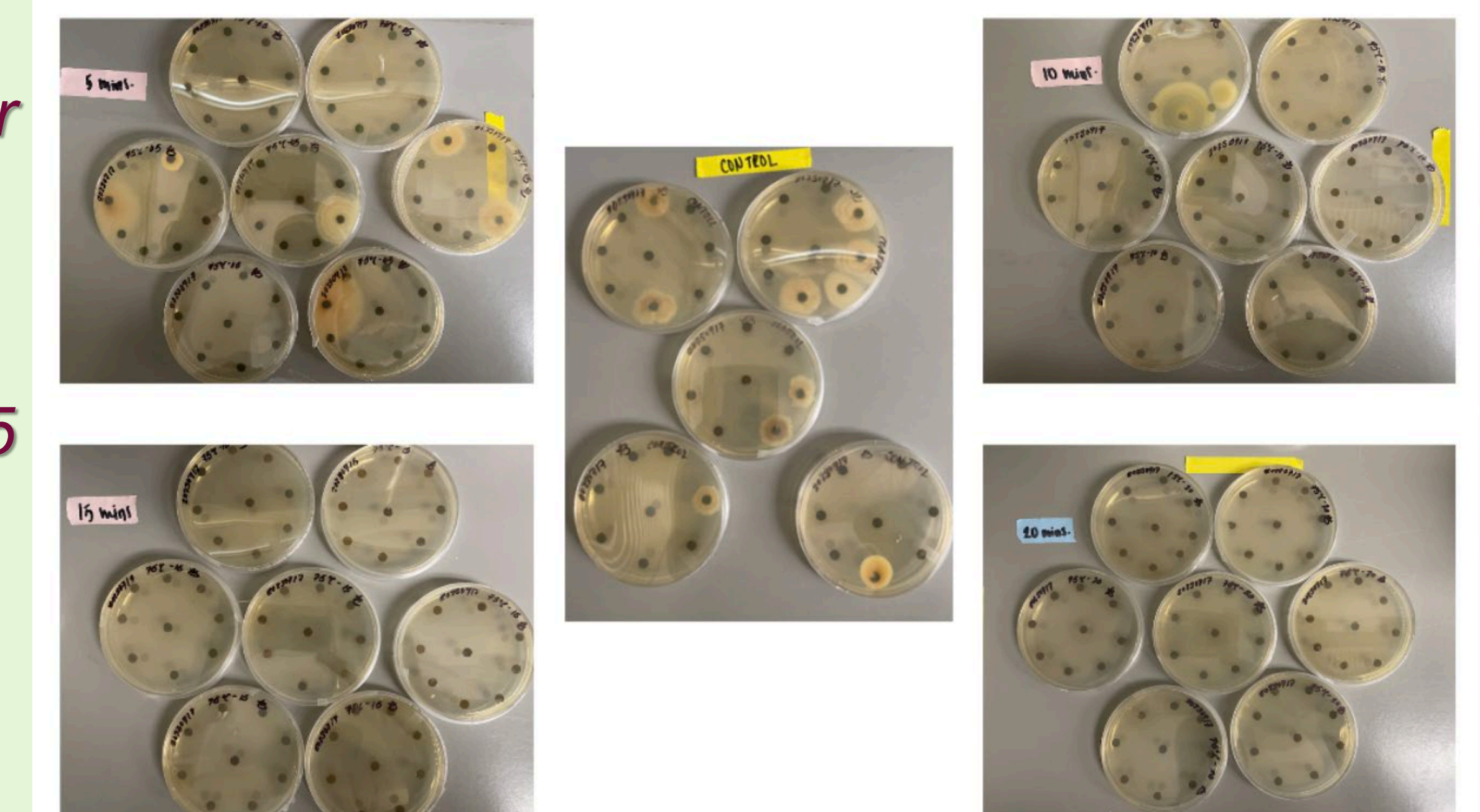


RESULTS



Pressure Cooker Treatment

2nd Attempt at 75 °C



CONCLUSION

After conducting a series of experiments aimed at sterilizing leaves, our observations led to several conclusions. Autoclaving proved highly effective in sterilizing leaves; however, its harshness raised concerns. UV light, across varying time durations, demonstrated limited effectiveness. On the other hand, the outcomes of pressure cooker treatment were inconsistent and dependent on temperature and time parameters. Consequently, we arrived at the determination that the most optimal treatment involved utilizing a pressure cooker set to 75°C for a duration of 15 minutes. These findings will serve as a foundation for our upcoming investigations into priority effects in the realm of leaf litter decomposition.

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