Degradation of pure mycelium strains over successive generations.

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Introduction

Pure mycelium materials are materials made by growing a fungus on top of a medium. This leads to a versatile material that is used as vegan leather, foam or meat substitute.

The goal of this project to look at the degradation of fungal strains over successive generations. Degradation is defined as the loss in growth rate, biomass and thickness.

Method

1. 5 mm slug of mycelium are placed on the center of an agar plate on a polycarbonate membrane to ensure complete separation of the agar (see figure 1). The list of strains used can be found in table 1.
2. A growth curve is made by measuring 2-3 days and 4-5 days after inoculation.
3. After the agar plate is fully colonized the mycelium is separated from the agar and the polycarbonate membrane.
4. The remaining mycelium on the agar is used for the reinoculation of a new agar plate with polycarbonate membrane for a next generation.
5. The resulting pure mycelium material is dried between baking paper in a specialized mould for 24 hours in the fumehood.
6. The biomass is determined (analytical scale) and the thickness is measured (Heidenhain) at 10 different points.

Table 1 List of strains used in this project

Strain
Fusarium Venenatum (CBS 128.95)
Trametes Versicolor (CBS 737.85)
Ganoderma Resinaceum (CBS 194.76)
Trametes Hirsuta (CBS 282.73)
Pycnoporus Sanguineus (CBS 614.73)
Ganoderma Resinaceum (CBS 352.74)
Trametes Versicolor (CBS 132858)
Ganoderma Lucidum (CBS 176.20)
Ganoderma Lucidum (CBS 132728)
Ganoderma Lucidum (CBS 251.61)
Schizophyllum Commune (CBS 341.81)
Pleurotus Ostreatus (CBS 342.69)
Lentinula Edodes (CBS 812.91)

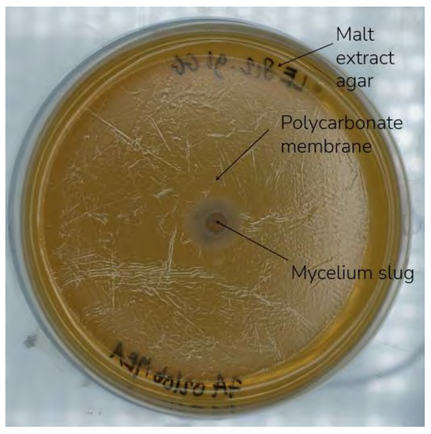

Figure 1 Lentinula Edodes (generation 7) growing on an agar plate with polycarbonate membrane.

Results

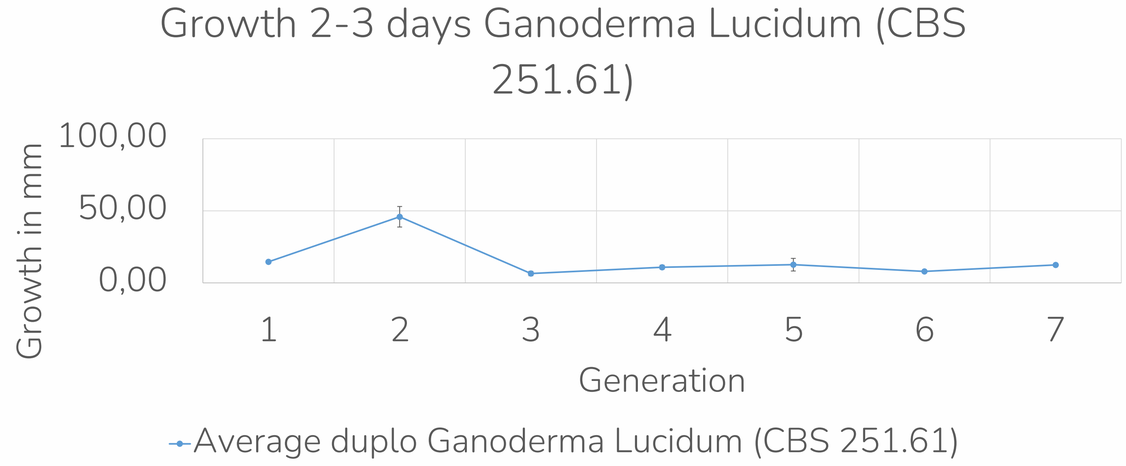

Figure 2 Growth of the different generations of Ganoderma Lucidum (CBS 251.61) after 2-3 days.

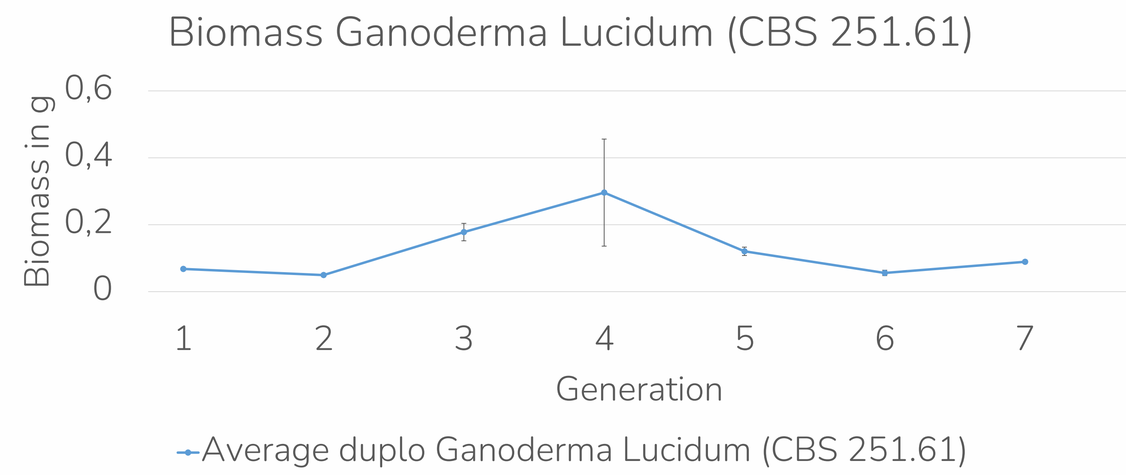

Figure 3 Biomass of the different generations of Ganoderma Lucidum (CBS 251.61).

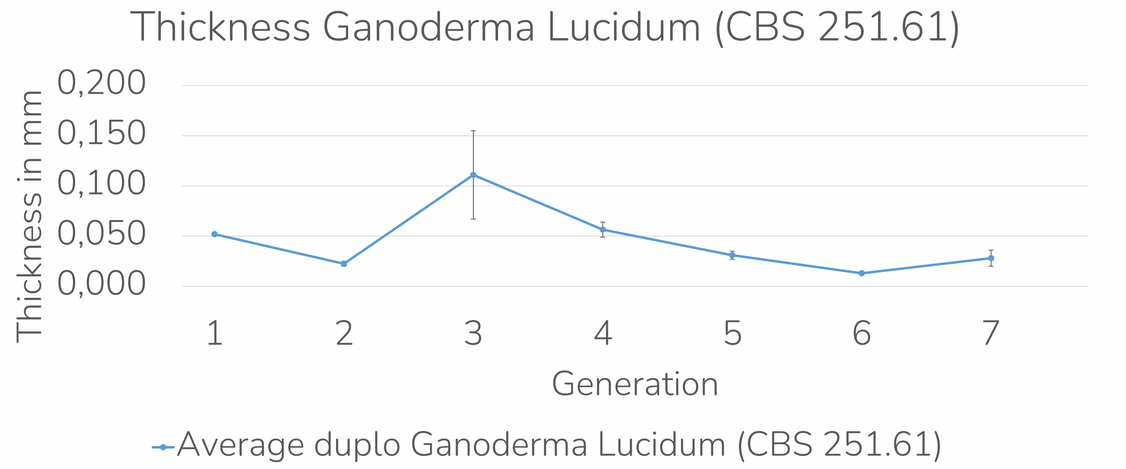

Figure 4 Thickness of the different generations of Ganoderma Lucidum (CBS 251.61).

Conclusion

It can be concluded that Ganoderma Lucidum (CBS 251.61) has degradation in growth rate between generation G2-G7. There is degradation in biomass between G4-G7. There is degradation in thickness between G3-G7.

References

1. Vandelook, S., Elsacker, E., Van Wylick, A. *et al.* ''Current state and future prospects of pure mycelium materials.'' *Fungal Biol Biotechnol* (2021).
2. Chen, X., Zhang, Z., Cui,. B. *et al.* ''Characteristics Analysis Reveals the Progress of Volvariella volvacea Mycelium Subculture Degeneration.'' *Frontiers in Microbiology* (2019).