Lentinus tigrinus Genomes, Species Limits, and Development

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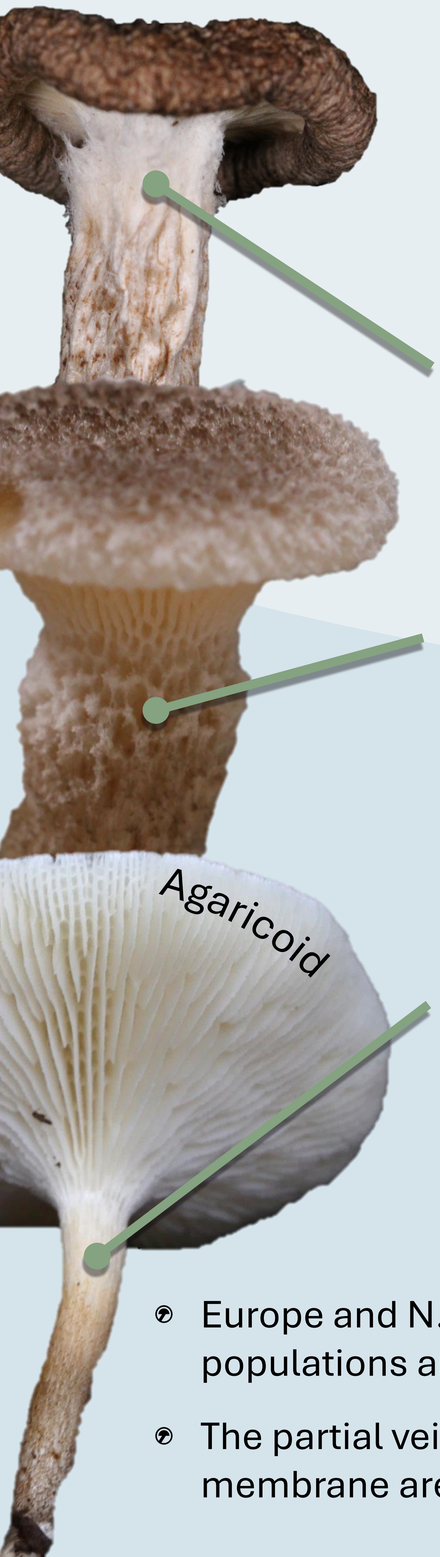
Biological Species Concept



Incompatible with:
- *L. squarrosulus*
- *L. sajor-caju*
- *L. crinitus*

Europe
- Agaricoid
- Partial veil
- Grows near water

Europe x N. Amer.
- Cross with secotioid strain
- Agaricoid F1
- Incomplete partial veil in F1

North America
- Agaricoid or secotioid
- No partial veil
- Grows near water

- Europe and N. America *L. tigrinus* populations are mating compatible[1]
- The partial veil and secotioid membrane are distinct structures

Improving Genome Assembly: In Progress

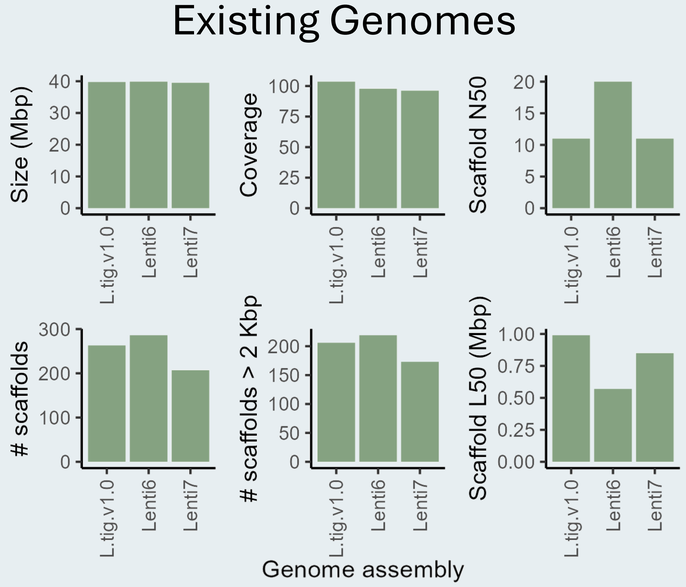


Fig. 1. Comparison of basic statistics of three *L. tigrinus* genomes available through MycoCosm.[2,3]

Goals
- PacBio sequencing to improve genome assembly
- Conduct GWAS to identify locus (Q1)
- Assess population structure to determine species limits and selection (Q2/Q3)

Developmental Biology

- Growth primarily through expansion
- Consistent with typical Agaricales model
- Inconsistent with typical Polyporales development
- Agaricales-like growth likely convergent

Questions

1. What is the element controlling agaricoid/secotioid dimorphism?
   - Past work: region of 3 Mb, 4 scaffolds[2]
   - Likely a single locus in the genome[2]
2. Are European and North American *L. tigrinus* specimens a single species?
   - Mating compatible but no overlap of morphological traits in the wild
   - Suggests lack of gene flow
3. Is the secotioid form under selection?
   - Likely yes – preliminary MA population indicates heterozygote advantage

References

1. Grand et al. Relationships within *Lentinus* subg. *Lentinus* (Polyporales, Agaricomycetes), with emphasis on sects. Lentinus and Tigrini. *Mycol Progress* 10, 399–413 (2011).
2. Wu et al. Genomics and development of Lentinus tigrinus: A white-rot wood-decaying mushroom with dimorphic fruiting bodies. *Genome Biology and Evolution* 10, 3250-3261 (2018).
3. Nordberg, H. et al. The genome portal of the Department of Energy Joint Genome Institute: 2014 updates. *Nucleic Acids Research* 42, D26-31 (2014).

Acknowledgements

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