Lentinus tigrinus dimorphism: sampling, population genetics, assortative mating

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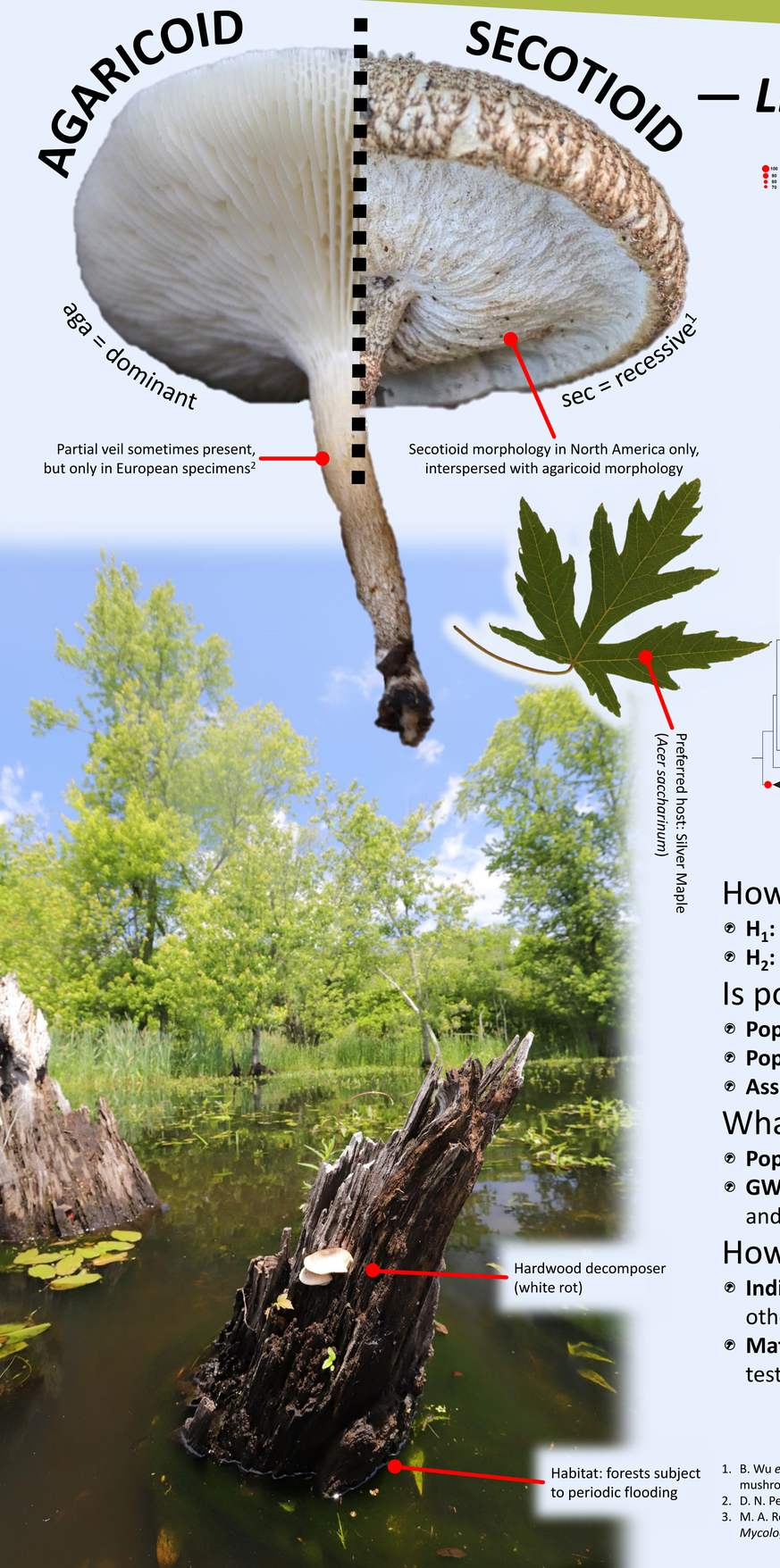
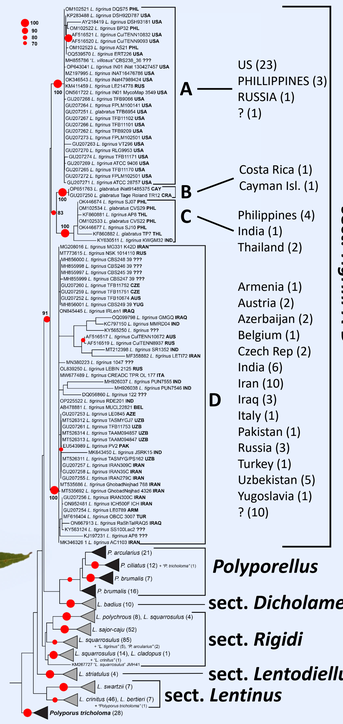


— *LENTINUS TIGRINUS* —



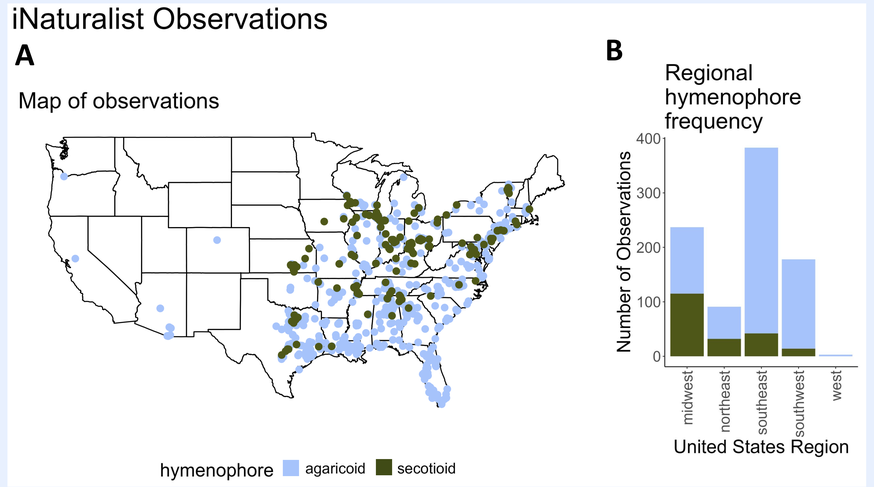


Figure 2. (Above) Both the agaricoid and secotioid morphologies of *L. tigrinus* are present throughout its North American range. Data are iNaturalist observations identifiable as *L. tigrinus* and that could be scored as agaricoid or secotioid (n = 892).

Figure 1. (Left) *Lentinus* Section *Tigrini* includes at least four lineages (A-D) which broadly correlate to geography. Lineages A and D correspond to the American and Eurasian lineages, respectively, of *L. tigrinus* sensu Pegler[2]. Tree generated using RAxML and 414 *Lentinus* GenBank ITS records. Red dots indicate bootstrap support > 70%.

— QUESTIONS —

How is evolution acting on the *L. tigrinus* dimorphism?

- **H_1:** Positive selection increases frequency of sec (adaptation to water dispersal[3])
- **H_2:** Balancing selection maintains dimorphism (beneficial under stochastic fluctuation, Fig. 3)

Is population structure correlated to morphology?

- **Populations:** Ipswich River, MA (55 samples on hand) and North Branch Chicago River, IL
- **Population genetics:** sequence MA & IL samples, test for morphology-based population structure
- **Assortative mating:** isolate spores, genotype by test cross, test assumptions of mating with χ^2

What is the genetic basis of the secotioid phenotype?

- **Population genetics**: sequence specimens across North America, correlate SNPs to morphology
- **GWAS:** cross an agaricoid and secotioid individual, fruit children to assess morphology, sequence and use GWAS to identify the secotioid locus

How important is colonization and mating?

- **Individual size:** collect multiple mushrooms from single logs, isolate dikaryons, cross with each other to test incompatibility
- **Mating alleles:** collect two compatible SSIs from each Ipswich sample, cross Ipswich samples to test for A/B locus incompatibility

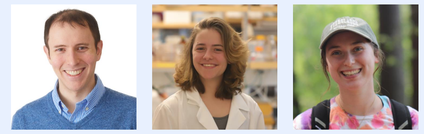
— REFERENCES —

1. B. 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).
2. D. N. Pegler, The genus Lentinus. *Kew Bull Addit Ser* **10**, 1-281 (1983).
3. M. A. Rosinski, A. D. Robinson, Secotioid divergence in Panus tigrinus: an emended discussion. *Mycologia* **61**, 830-832 (1969).

— SUPPORT —

Clark University Faculty Development Award and Klein Endowed Professorship

LEEP undergraduate research award



— FOLLOW US —

— VARIABILITY —

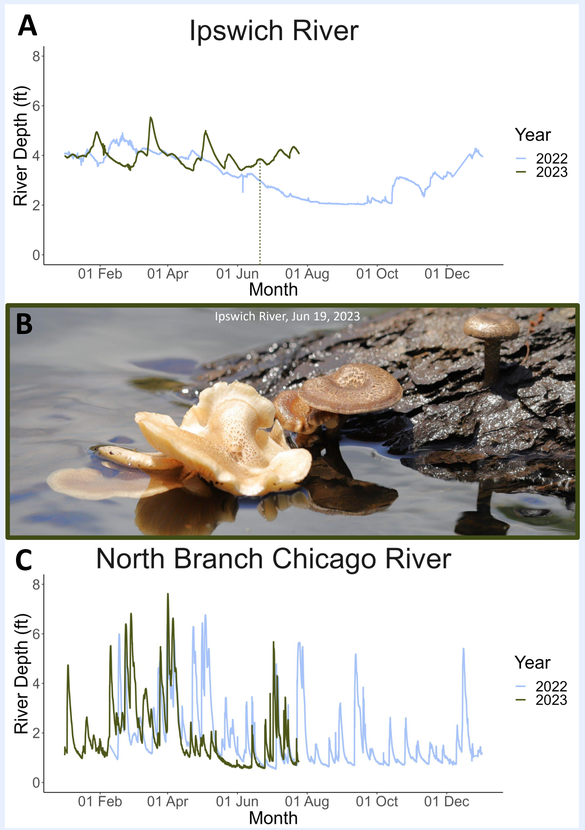


Figure 3. *Lentinus tigrinus* experiences stochastic fluctuation in water levels, within and between years. A) Ipswich river levels in 2022-2023. B) Specimens observed in the Ipswich River on 6/19/2023 (dotted line in A). C) North Branch Chicago River levels in 2022-2023. Data retrieved from USGS (https://waterdata.usgs.gov/nwis/rt).