

Selection on natural *Saccharomyces paradoxus* diversity in a seasonally changing environment

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In their natural habitats, fungi are subject to seasonal changes in temperature, water availability, and nutrient availability, among other changing selective pressures. We expect populations of microscopic fungi with fast generation times to quickly and repeatedly adapt to seasonal environmental changes. *Saccharomyces paradoxus*, the sister species of the model yeast *S. cerevisiae*, is an ideal wild model for investigations of evolutionary responses to seasonal changes. Previous research showed that *S. paradoxus* lives year-round in a European forest, and we expect *S. paradoxus* populations to be subject to seasonal environmental changes. We have been sampling *S. paradoxus* from a local forest since early 2017, and have developed microsatellite markers to test population structure among *S. paradoxus* isolates collected during different seasons. We are also measuring individual *S. paradoxus* isolates' growth rates in environments representing summer and winter conditions. Preliminary data from a subset of isolates collected in the spring of 2017 indicate that there is both genotypic and phenotypic diversity in the *S. paradoxus* population on a spatial scale of centimeters to hundreds of meters. High diversity in the European *S. paradoxus* population contrasts with previously reported low intrapopulation diversity in North American *S. paradoxus* populations. We expect seasonal selection to operate on this diversity. If seasonal changes select for seasonally adapted individuals, we expect the *S. paradoxus* population to be structured over time. We also expect individuals to have higher growth rates in environments from which they were isolated than individuals from other seasons. We will report *S. paradoxus* population and phenotypic structure over time and space in its natural forest habitat.