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Salle de réunion


FITNESS EFFECT OF MUTATIONS BETWEEN PHASES OF THE LIFE CYCLE OF THE ROOT-ROT FUNGUS *HETEROBASIDION PARVIPORUM*


par

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 The life cycle of eukaryotes is defined by an alternation of haploid and diploid phases. Many eukarotic species spend a significant portion of this cycle both as haploids and diploids (i.e. haploid-diploid life cycle). Theoretical models predict that both the impact of ploidy on mutation effects and the level of dominance of deleterious mutations determine which phase of the life cycle is the longest. For example, the diploid portion of the life cycle is favoured when deleterious mutations have a stronger effect in haploids than in homozygous diploids or when they are partially recessive in heterozygous diploids. We derived a statistical model to estimate the impact of ploidy on mutation effects and the average level of dominance and epistasis based on haploid and diploid fitness data.

 We apply this model to study the life cycle of basidiomycete fungi, many of which include a heterokaryotic phase where deleterious mutations can be masked (the heterokaryotic mycelium possesses two unfused parental nuclei and is not strictly speaking diploid). Several studies have shown that the heterokaryotic phase is longer than the homokaryotic (haploid) phase in the root-rot basidiomycete fungus *Heterobasidion parviporum*. To verify the predictions of theoretical models, we estimated the impact of ploidy on mutation effects, and the level of dominance of deleterious mutations in this species. Our results shed a new light on the biology of this species and help understand the evolution of heterokaryotic fungi.

 **Keywords:** homokaryon, heterokaryon, growth rate, genetic distance, dominance, epistasis, deleterious mutations.