

Complex adaptation with stress-induced mutagenesis

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The role of stress-induced mutagenesis in evolution and adaptation is still not clear, despite numerous evidence that it occurs in many species of bacteria via several molecular and genetic mechanisms. We have previously published the results of two theoretical population genetic models which show that stress-induced mutator alleles can be favored by natural selection both in constant environment and in changing ones.

In this study we analyze a model of adaptation in a rugged fitness landscape. We show that stress-induced mutagenesis increases the adaptation rate of populations without inflicting a mutational load on their mean fitness. We suggest that stress-induced mutagenesis can be an alternative to Wright's classical "shifting balance theory" and can help to explain the evolution of complex traits.