Dear editor,

Attached please find our manuscript “Complex Adaptation with Stress-Induced Mutagenesis”. Stress-induced mutagenesis is often suggested as an important force in adaptive evolution, but we still do not understand how it affects adaptation. Primarily, it is unclear how stress-induced mutagenesis differs from constitutive mutagenesis with respect to complex adaptation.

Using mathematical models and simulations we found that stress-induced mutagenesis increases the rate of fitness valley crossing in asexual populations and that its effect is quantitatively different from that of constitutive mutagenesis.

Our results relate to the theory of mutation rate optimization, which suggests that the mutation rate must balance between *adaptability* – the ability to adapt - and *adaptedness* – the ability to remain adapted. Because stress-induced mutagenesis increases the rate of complex adaptation without reducing the equilibrium mean fitness, we suggest that it breaks the trade-off between *adaptability* and *adaptedness*.

We suggest Tim F. Cooper as an editor for the paper, because of his previous work on complex adaptation and evolvability.

We hope you will find this manuscript worthy of publication in Proceedings of the Royal Society B.

Sincerely,

Lilach Hadany

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