Stability and response of polygenic traits to stabilizing selection and mutation. Supplementary Information 2

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2 Allele Frequency Spectra

At equilibrium, alleles of large effect are close to fixation. However, whether most of these are at the '+' or '-' state depends on the relative position of the optimum, and on how much the trait deviates from it. Intuitively, we expect that if $z_\circ > 0$ (conversely, $z_\circ < 0$) most alleles will be at the '+' ('-') state. Figure S1 presents the allele frequency spectrum from numerical runs showing that the position of the optimum strongly biases the allelic states.

The proportion of alleles of large effect will determine the relative height of the central peak (central column in Fig. S1) with respect to the peaks close to the borders. For instance, for traits with many alleles of small effect the central peak will be substantial. In contrast, traits composed mainly of alleles of large effect will have a moderate or practically absent central peak. This is best visualized in the central column for Fig. S1. If $\sqrt{\mu/S}$ is increased, the spectrum is biased towards fixation, and as it is decreased, the spectrum is less dense at the fixation borders.
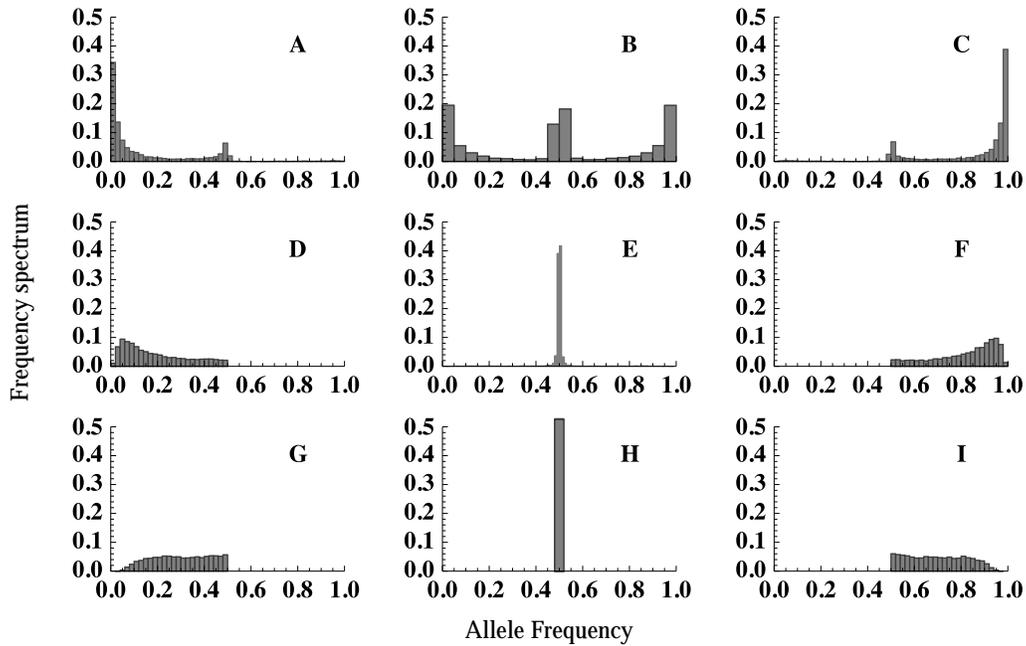
Figure S1: Allele frequency spectrum for different proportions of alleles of large effect, and for different positions of the optimum. Optimum value set at: 90% of the maximum trait value to the left (left column), close to zero (central column), 90% of the maximum trait value to the right (right column). Proportion of alleles of large to small effects is: 90% (top row), 50% (central row), 10% (lower row). Each plot is composed of the end points of 50 runs with random initial condition and realization of effects. $\mu = 10^{-4}$, $S = 0.1$, $n = 100$.