1 Logistic-Linear Growth

Figure 1 shows the evolution of the population size and the inferred mutation rate over time for $\mu = 2$. Both these values are normed for comparability: The population size is divided by N, while the inferred mutation rate is divided by the true mutation rate and by a factor of 2 (to account for the simulations being only symmetric reproduction events). I then fitted the lines from time point 20-50, because that's when the inferred mutation rate seems to enter a linear phase. It can be seen that while there is an early fast-growing phase, the linear fit is very good for both values, and the slopes look quite close.For other values of μ, this plot looks pretty much exactly identical, except for very slight variance.

Figure 2 shows the slope of the fitted lines from figure 1 for different values of μ, ranging from 0.2 to 2. As suspected, the population growth and the slope of the inferred mutation rate are quite close, though the latter is very slightly but consistently higher. The true μ however seems to have absolutely no influence on the relative slope.

Lastly, we can see a few VAF-distributions for different time points in figure 3. At $t = 1$ and 2, the distribution looks quite close to $1/f^2$. From $t \geq 10$, it's already very close to $1/f$. Only around $t = 5$, it seems to be in the middle.

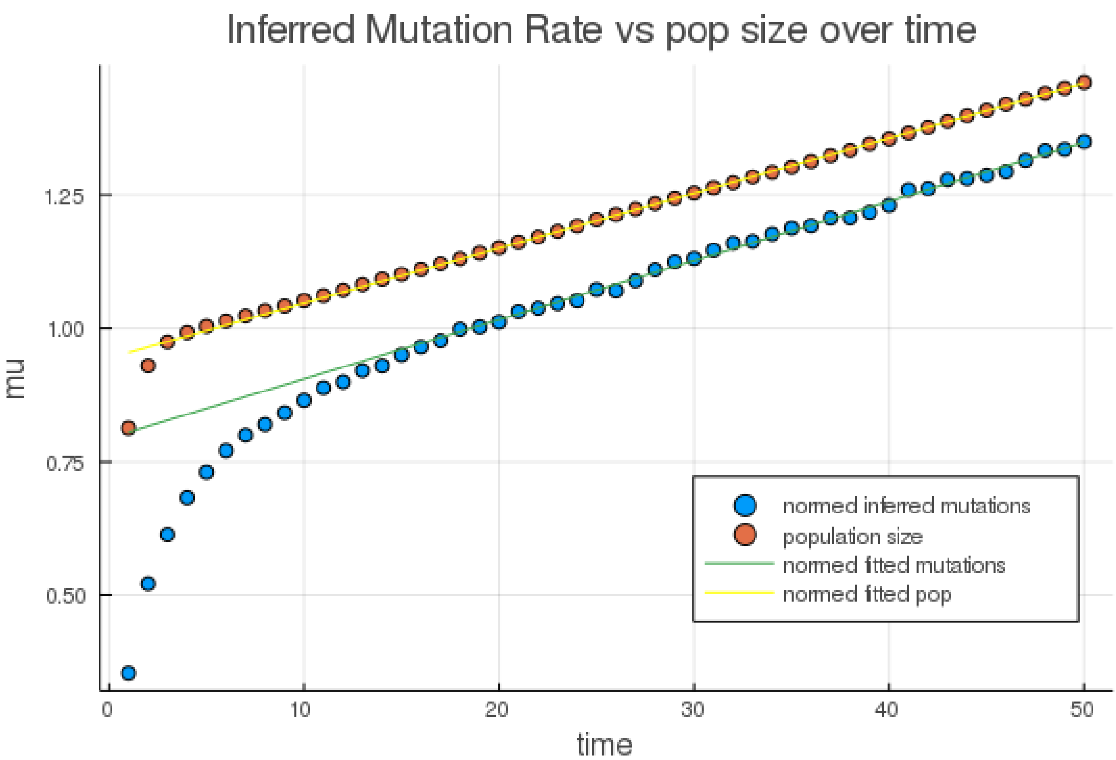

Figure 1: On the y-Axis, normed population size $N(t)/N_{max}$ in red compared to the normed inferred mutation rate $inf_\mu(t)/\mu_{true}/2$ in blue. On the x-Axis, time. Parameters: $N_{max} = 200$, $\mu = 2$, $S = 100$.

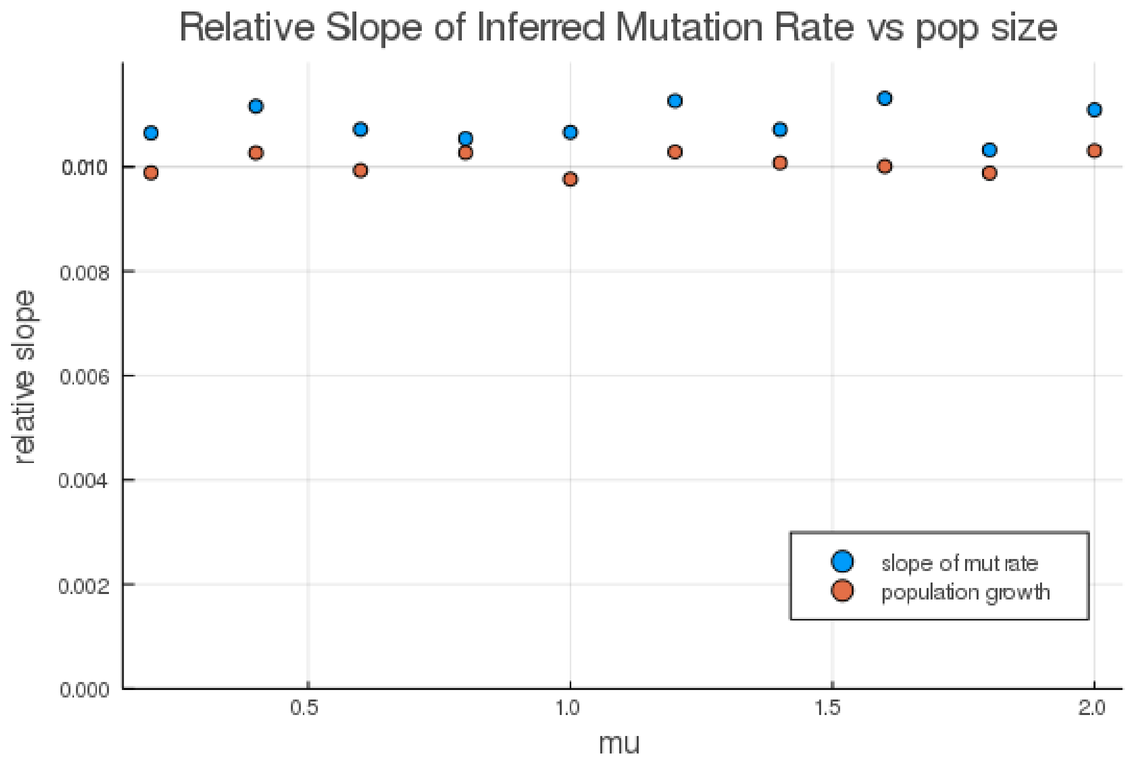

Figure 2: On the y-Axis, slope of the increase of either the normed population size $N(t)/N_{max}$ in red compared to the normed inferred mutation rate $inf_{\mu}(t)/\mu_{true}/2$ in blue. On the x-Axis, the true mutation rate. Parameters: $N_{max} = 200$, $\mu = 2$, $S = 100$.

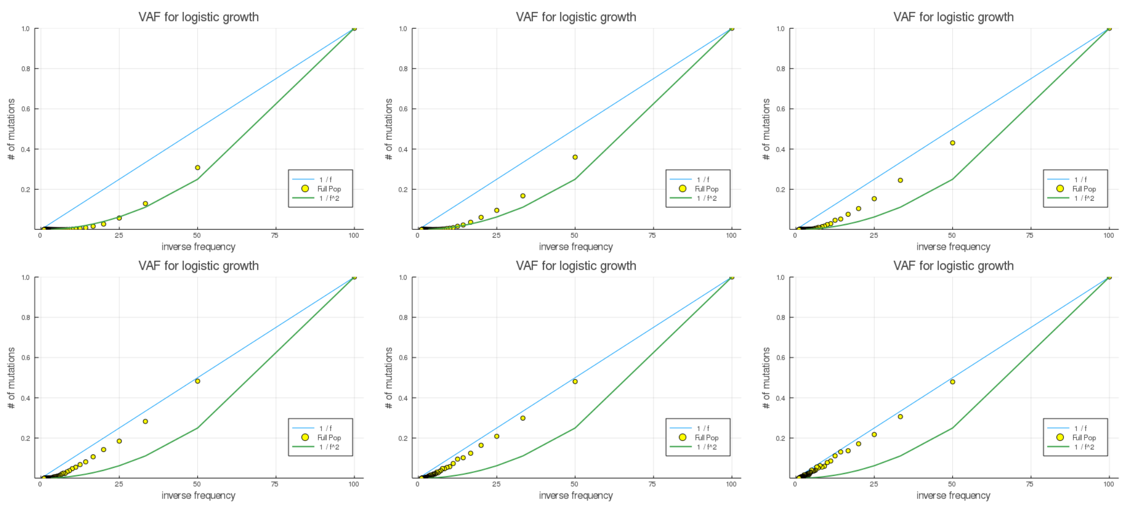

Figure 3: These figures show the VAF-distribution for various time points, increasing from upper left to lower right. Parameters: $N_{max} = 200$, $\mu = 2$, $S = 100$, $t = \{1, 2, 5, 10, 20, 50\}$.