Supplementary materials for "Establishment of a new sex-determining allele driven by sexually antagonistic selection"

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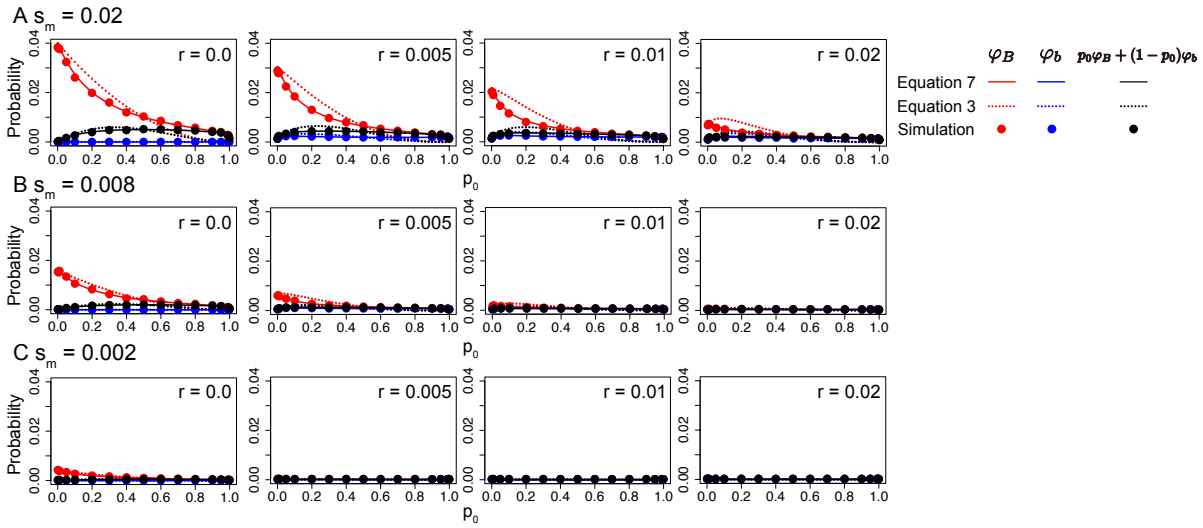

Figure S1: Establishment probability for the case of balancing selection on allele B. Different strengths of selection are assumed: (A) $s_m = -s_f = 0.02$, (B) $s_m = -s_f = 0.008$ and (C) $s_m = -s_f = 0.002$. Other parameters are assumed to be $h_m = 1.0, h_f = 0.0, N = 10,000, u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

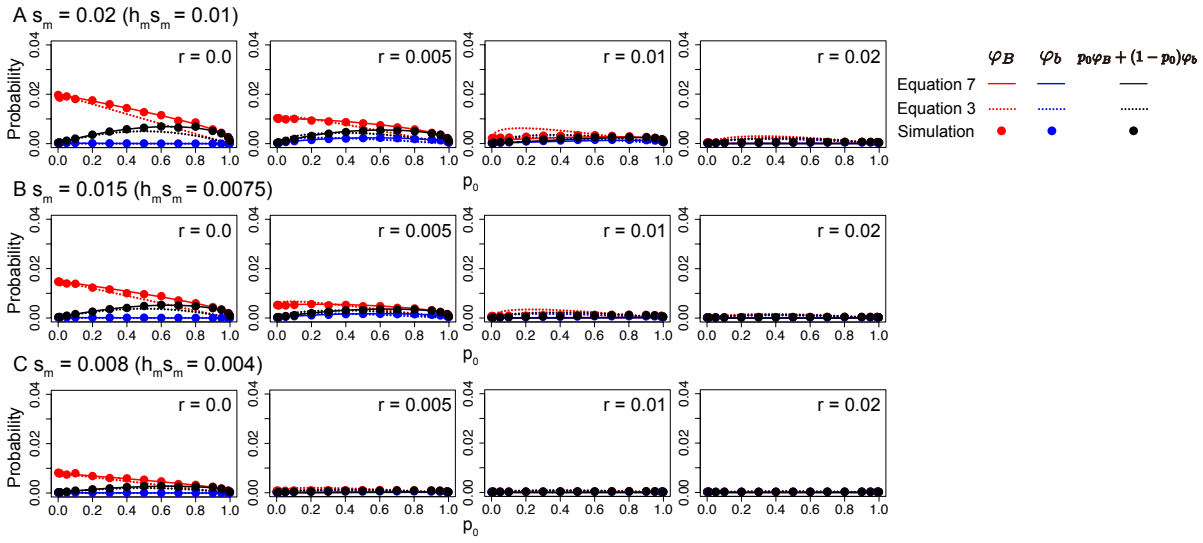

Figure S2: Establishment probability for the case of negative selection against allele B. Different strengths of selection are assumed: (A) $s_m = 0.02$, (B) $s_m = 0.015$ and (C) $s_m = 0.008$. Other parameters are assumed to be $s_f = -2s_m, h_m = h_f = 0.5$, $N = 10,000$, and $u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

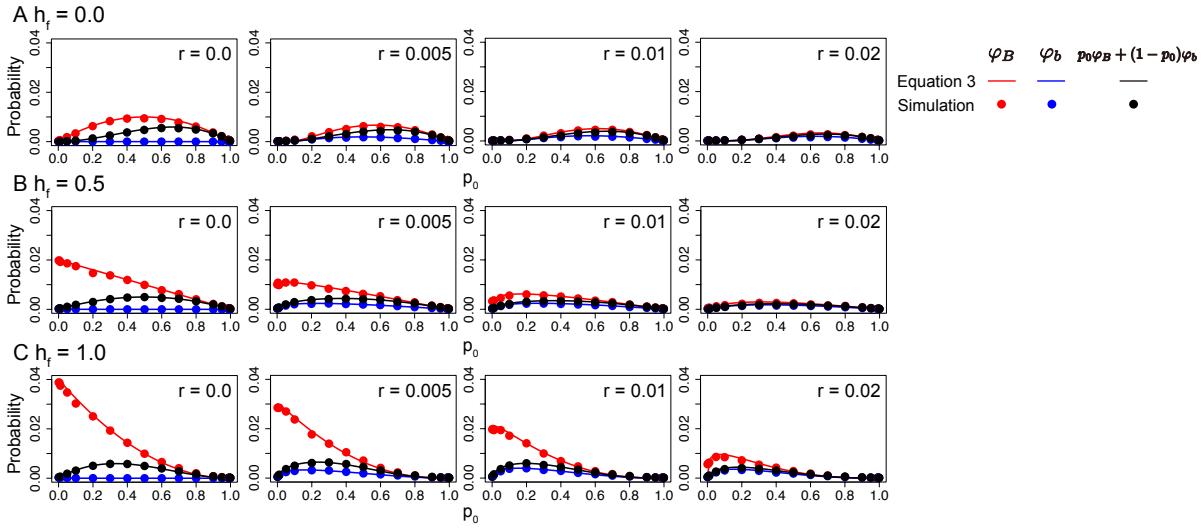

Figure S3: Establishment probability of allele A for different dominance and recombination rates in Case 2. Three dominance coefficients are assumed: (A) $h_f = 0.0$, (B) $h_f = 0.5$ and (C) $h_f = 1.0$. Other parameters are as follows: $s_f = -s_m = 0.02, h_m = h_f, N = 10000, u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

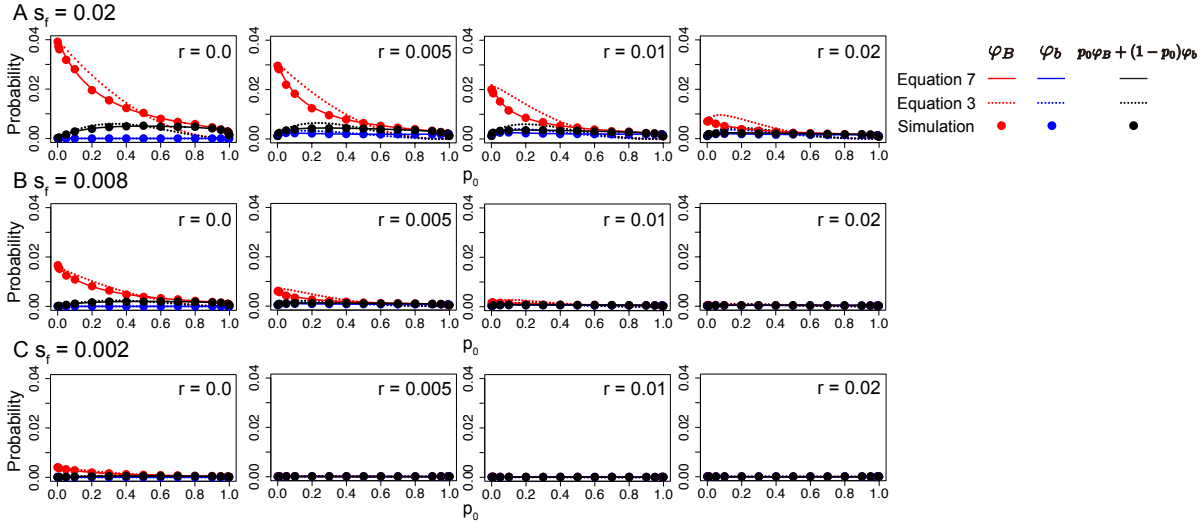

Figure S4: Establishment probability for the case of balancing selection for allele B in Case 2. Different strengths of selection are assumed: (A) $s_f = -s_m = 0.02$, (B) $s_f = -s_m = 0.008$ and (C) $s_f = -s_m = 0.002$ are assumed. Other parameters are $h_f = 1.0, h_m = 0.0, N = 10000, u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

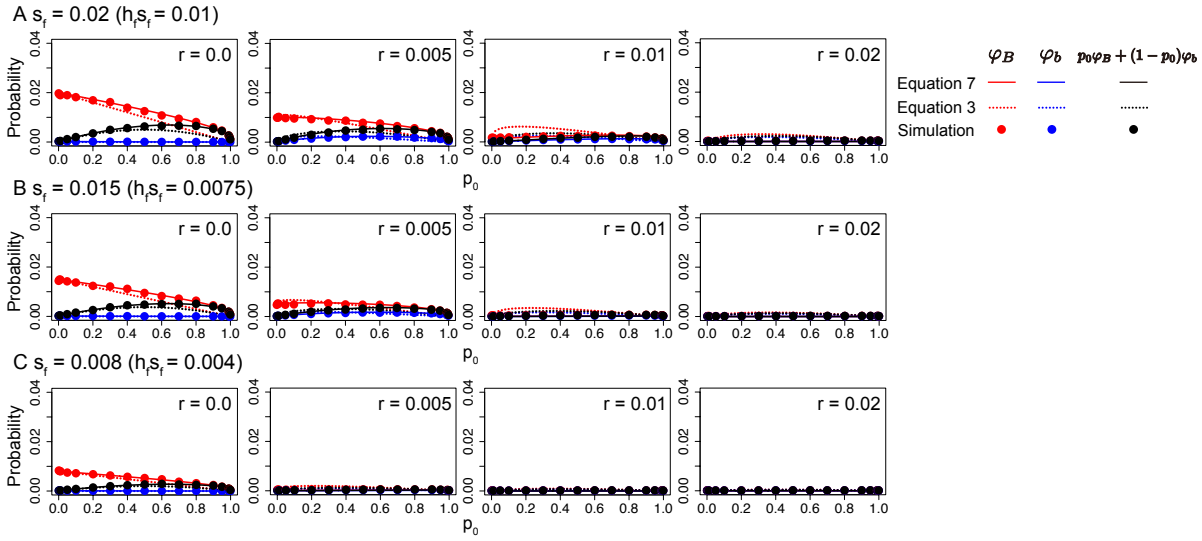

Figure S5: Establishment probability for the case of negative selection against allele B in Case 2. Different strengths of selection are assumed: (A) $s_f = 0.02$, (B) $s_f = 0.015$ and (C) $s_f = 0.008$. Other parameters are $s_m = -2s_f, h_m = h_f = 0.5$, $N = 10,000$, and $u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

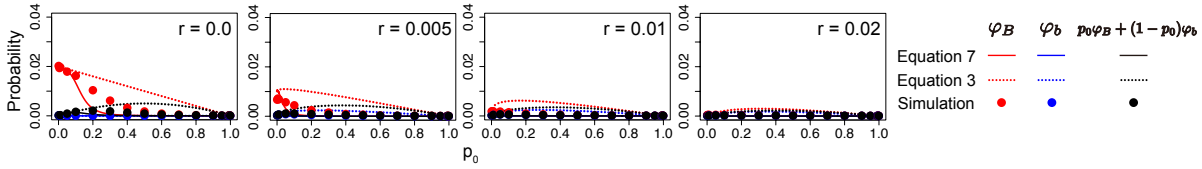

Figure S6: Establishment probability for the case of positive selection for allele B in Case 2. Other parameters are $s_f = 0.02, s_m = -0.01, h_m = h_f = 0.5$, $N = 10,000$, and $u = v = 1.0 \times 10^{-6}$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

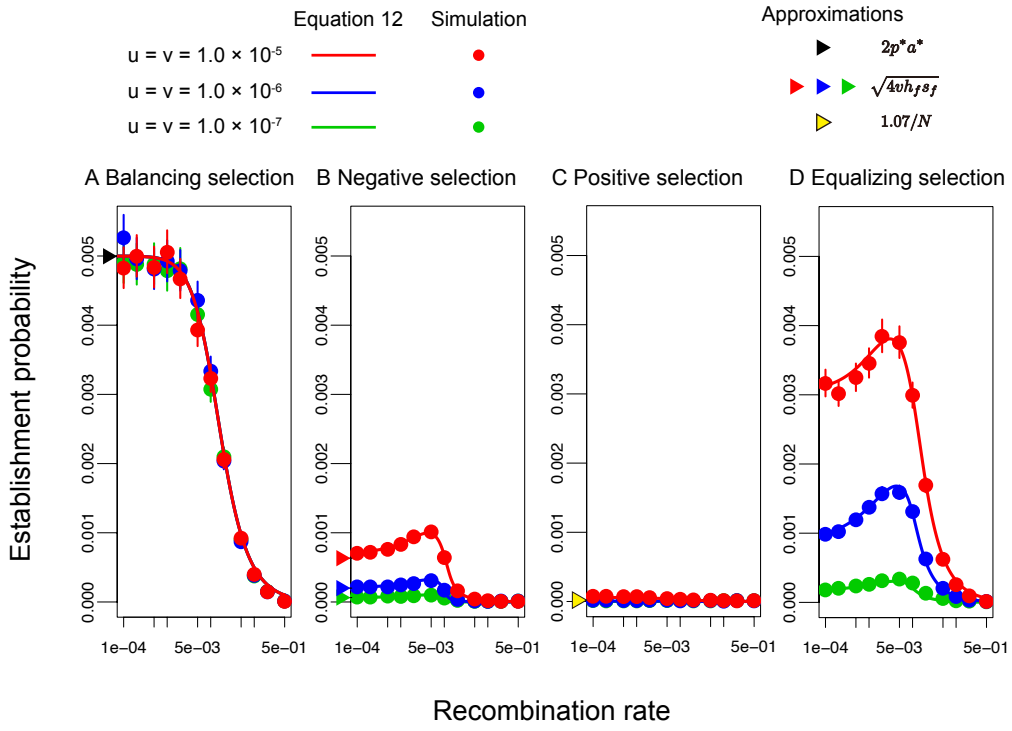

Figure S7: Establishment probability of a feminizing allele for different modes of sexually antagonistic selection. $N = 100,000$ and $u = v$ are assumed. Other parameters are (A) $s_f = 0.02, s_m = -0.02, h_f = 1.0, h_m = 0.0$, (B) $s_f = 0.02, s_m = -0.025, h_m = h_f = 0.5$, (C) $s_f = 0.02, s_m = -0.01, h_m = h_f = 0.5$ and (D) $s_f = 0.02, s_m = -0.02, h_m = h_f = 0.5$. Error bars on the red and blue circles represent the 95 % confidence interval.

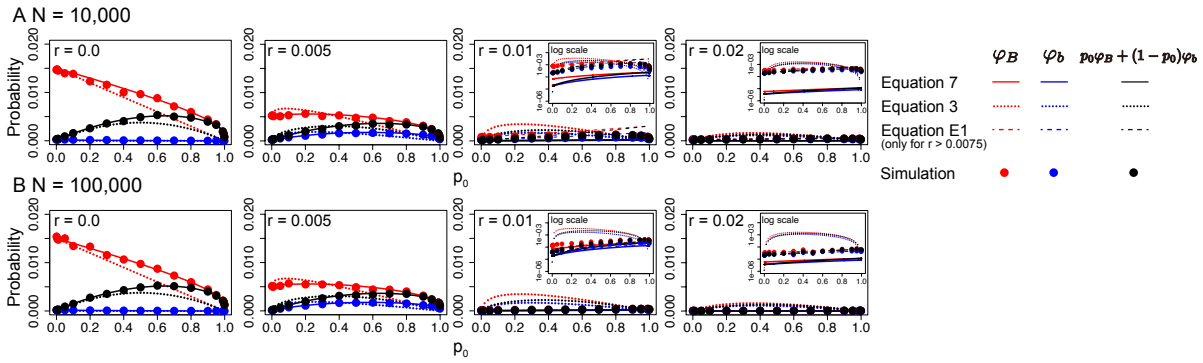

Figure S8: Establishment probability for the case of negative selection against allele B in Case 1. Different population sizes are assumed: (A) $N = 10,000$, and (B) $N = 100,000$. Other parameters are $s_m = 0.015, s_f = -0.03, h_m = h_f = 0.5$ and $u = v = 1.0 \times 10^{-6}$. Note that Equation E1 is plotted only for $r = 0.01, 0.02$. In the inner panels, the y-axis is log-scaled. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

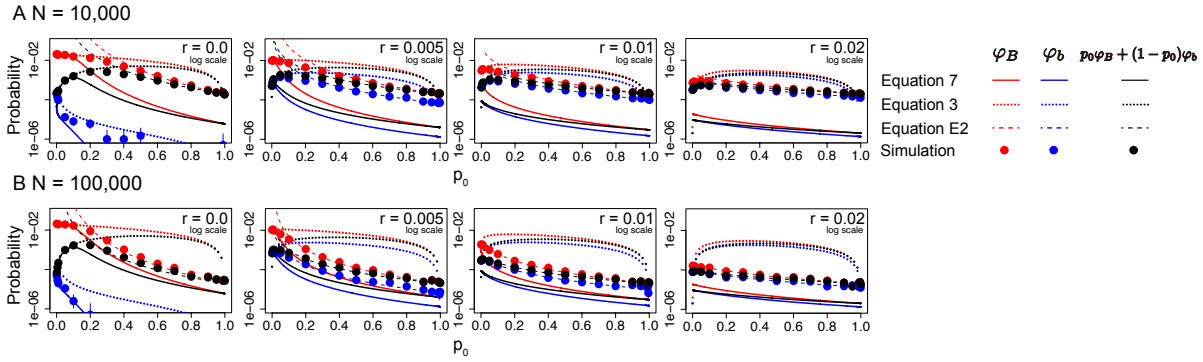

Figure S9: Establishment probability for the case of positive selection for allele B in Case 1. Different population sizes are assumed: (A) $N = 10,000$, and (B) $N = 100,000$. Other parameters are $s_m = 0.02, s_f = -0.01, h_m = h_f = 0.5$ and $u = v = 1.0 \times 10^{-6}$. The y-axis is log-scaled. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

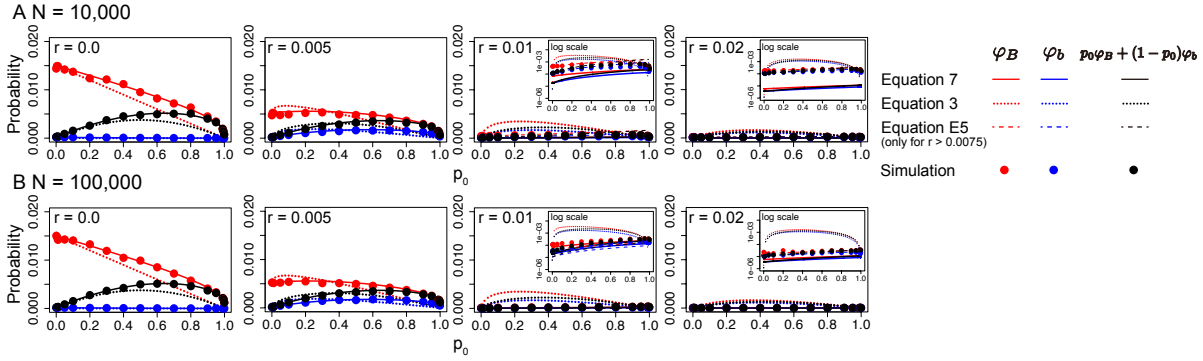

Figure S10: Establishment probability for the case of negative selection against allele B in Case 2. Different population sizes are assumed: (A) $N = 10,000$, and (B) $N = 100,000$. Other parameters are $s_f = 0.015, s_m = -0.03, h_m = h_f = 0.5$ and $u = v = 1.0 \times 10^{-6}$. Note that Equation E5 is plotted only for $r = 0.01, 0.02$. In the inner panels, the y-axis is log-scaled. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

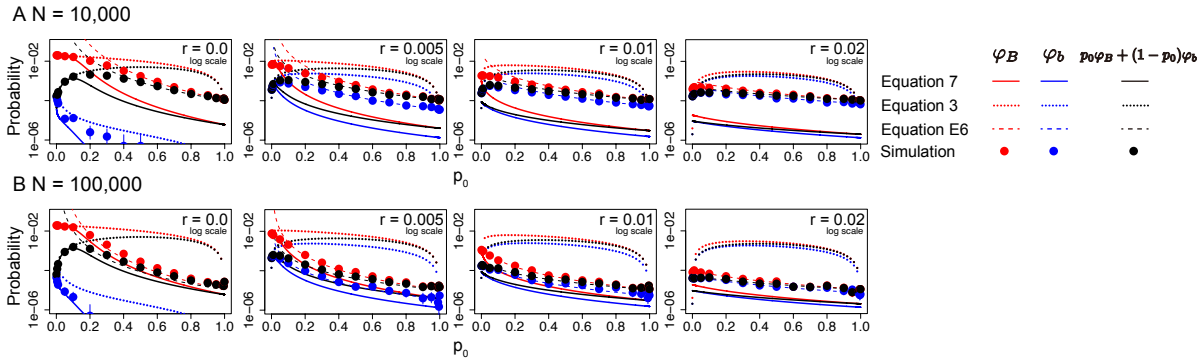

Figure S11: Establishment probability for the case of positive selection for allele B in Case 2. Different population sizes are assumed: (A) $N = 10,000$, and (B) $N = 100,000$. Other parameters are $s_f = 0.02, s_m = -0.01, h_m = h_f = 0.5$ and $u = v = 1.0 \times 10^{-6}$. The y-axis is log-scaled. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.

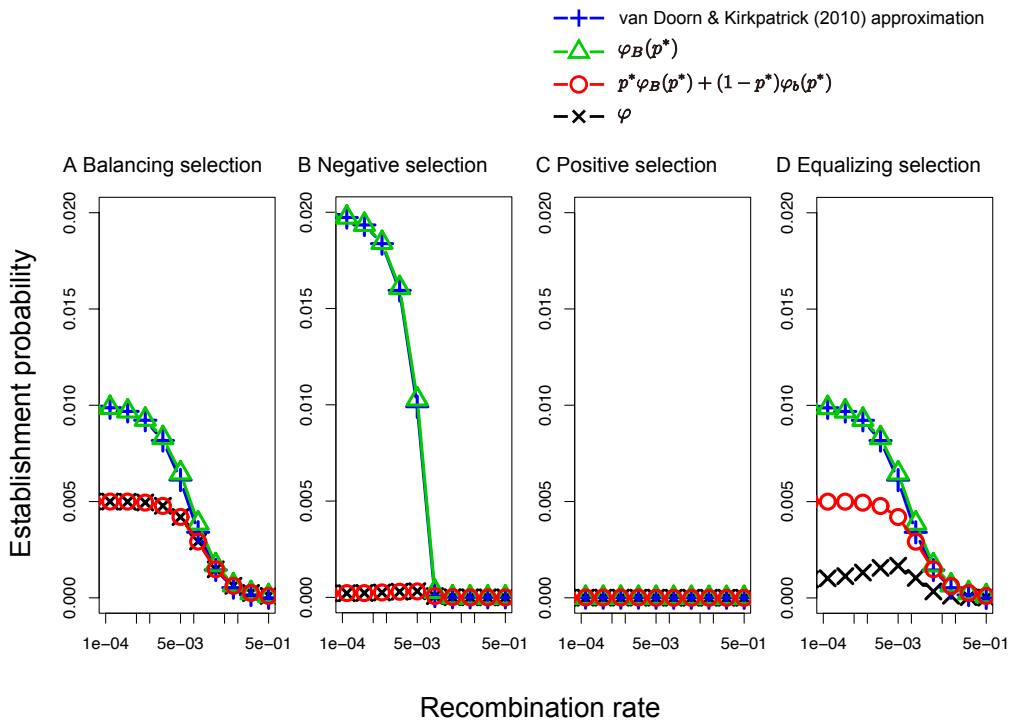

Figure S12: Equation 8 of van Doorn and Kirkpatrick (2010) is plotted together with our theoretical results. $N = 100,000$ and $u = v = 1.0 \times 10^{-6}$ are assumed. Other parameters are (A) $s_f = 0.02, s_m = -0.02, h_f = 1.0, h_m = 0.0$, (B) $s_f = 0.02, s_m = -0.025, h_f = h_m = 0.5$, (C) $s_f = 0.02, s_m = -0.01, h_f = h_m = 0.5$ and (D) $s_f = 0.02, s_m = -0.02, h_f = h_m = 0.5$. Error bars on the red and blue circles represent the 95 % confidence interval, but they are too small to be seen.