Table S1: Pearson's correlation tests for the association between the coefficient of background selection (B) and H_S . P-values and r are computed on the simulations with BGS only.

Treatment	Generation after split	r	P	Bonferroni correction
Default	1	0.063	4.0 x 10 ⁻⁵	**
,	5	0.061	0	***
	158	0.060	0	***
	1581	0.065	0	***
	10000	0.063	4.0 x 10 ⁻⁵	**
High Migration	1	0.061	4.0 x 10 ⁻⁵	**
	5	0.060	0	***
	158	0.060	4.0 x 10 ⁻⁵	**
	1581	0.057	4.0 x 10 ⁻⁵	**
	10000	0.074	0	***
Large N	10	0.076	4.0 x 10 ⁻⁴	
	50	0.075	0.001	
	1580	0.073	1.3 x 10 ⁻³	
	15810	0.070	1.8 x 10 ⁻³	
	100000	0.085	2.0 x 10 ⁻⁴	*
Human genetic	1	-0.005	0.729	
тар	5	-0.007	0.617	
	158	-0.013	0.424	
	1581	-0.029	0.080	
	10000	-0.007	0.659	
Low selection	1	0.142	0	***
pressure	5	0.151	0	***
	158	0.156	0	***
	1581	0.206	0	***
	10000	0.217	0	***
Constant μ	1	0.399	0	***
	5	0.406	0	***
	158	0.411	0	***
	1581	0.521	0	***
	10000	0.535	0	***
No Migration	1	0.066	0	***
	5	0.065	4.0 x 10 ⁻⁵	**
	158	0.068	0	***
	1581	0.069	0	***
	10000	0.067	0	***
No Recombination	1	0.160	0	***
	5	0.163	0	***
	158	0.165	0	***
	1581	0.193	0	***
	10000	0.215	0	***

Table S2: Pearson's correlation tests for the association between the coefficient of background selection (B) and F_{ST} . P-values and r are computed on the simulations with BGS only.

Treatment	Generation	r	P	Bonferroni
	after split			correction
Default	1	-0.011	0.458	
	5	0.007	0.653	
	158	-0.032	0.053	
	1581	-0.030	0.062	
	10000	-0.019	0.243	
High Migration	1	-0.016	0.313	
	5	0.026	0.094	
	158	0.033	0.029	
	1581	-0.004	0.779	
	10000	-0.010	0.522	
Large N	10	0.021	0.348	
	50	-0.022	0.332	
	1580	-0.038	0.086	
	15810	-0.097	0	***
	100000	-0.040	0.072	
Human genetic	1	-0.017	0.286	
тар	5	0.004	0.836	
	158	-0.013	0.398	
	1581	0.013	0.434	
	10000	0.025	0.116	
Low selection	1	-0.013	0.577	
pressure	5	-0.017	0.432	
	158	0.023	0.304	
	1581	-0.026	0.258	
	10000	-0.038	0.092	
Constant μ	1	-0.025	0.256	
	5	-0.030	0.185	
	158	-0.052	0.021	
	1581	-0.039	0.081	
	10000	-0.058	0.010	
No Migration	1	0.008	0.646	
	5	0.009	0.585	
	158	-0.061	2.8 x 10 ⁻⁴	•
	1581	-0.087	0	***
	10000	-0.102	0	***
No Recombination	1	-0.008	0.612	
	5	-0.037	0.021	
	158	-0.006	0.706	
	1581	-0.022	0.168	
	10000	-0.007	0.658	

Table S3: Pearson's correlation tests for the association between the coefficient of background selection (B) and $F_{ST \text{ (average of ratios)}}$. P-values and r are computed on the simulations with BGS only.

Treatment	Generation	r	P	Bonferroni
	after split			correction
Default	1	0.016	0.307	
	5	0.060	4.0 x 10 ⁻⁵	**
	158	0.030	0.053	
	1581	0.022	0.162	
	10000	0.031	0.041	
High Migration	1	-0.007	0.649	
	5	0.042	5.9 x 10 ⁻³	
	158	0.048	1.7 x 10 ⁻³	
	1581	0.011	0.480	
	10000	0.025	0.112	
Large N	10	0.093	4.0 x 10 ⁻⁵	**
	50	0.067	2.8 x 10 ⁻³	
	1580	0.033	0.143	
	15810	-0.011	0.618	
	100000	0.050	0.024	
Human genetic	1	-0.011	0.491	
map	5	0.039	9.2 x 10 ⁻³	
	158	0.024	0.128	
	1581	0.023	0.139	
	10000	0.038	0.012	
Low selection	1	0.012	0.579	
pressure	5	0.021	0.357	
	158	0.071	1.4 x 10 ⁻³	
	1581	0.012	0.583	
	10000	0.004	0.856	
Constant μ	1	0.030	0.180	
	5	0.084	2.8 x 10 ⁻⁴	
	158	0.064	4.0 x 10 ⁻³	
	1581	0.080	4.8 x 10 ⁻⁴	
	10000	0.055	0.015	
No Migration	1	0.018	0.251	
	5	0.058	8.0 x 10 ⁻⁵	*
	158	0.026	0.078	
	1581	0.034	0.030	
	10000	-0.003	0.851	
No Recombination	1	0.019	0.245	
	5	0.067	0	***
	158	0.103	0	***
	1581	0.102	0	***
	10000	0.129	0	***

Table S4: Pearson's correlation tests for the association between the coefficient of background selection (B) and d_{XY} . P-values and r are computed on the simulations with BGS only.

Treatment	Generation after split	r	P	Bonferroni correction
Default	1	0.063	0	***
	5	0.061	0	***
	158	0.060	4.0 x 10 ⁻⁵	**
	1581	0.065	0	***
	10000	0.062	4.0 x 10 ⁻⁵	**
High Migration	1	0.061	8.0 x 10 ⁻⁵	*
	5	0.060	0	***
	158	0.060	0	***
	1581	0.057	8.0 x 10 ⁻⁵	*
	10000	0.074	0	***
Large N	10	0.076	5.2 x 10 ⁻⁴	
	50	0.075	6.4 x 10 ⁻⁴	
	1580	0.073	1.2 x 10 ⁻³	
	15810	0.070	1.6 x 10 ⁻³	
	100000	0.085	8.0 x 10 ⁻⁵	*
Human genetic	1	-0.005	0.725	
тар	5	-0.007	0.647	
	158	-0.012	0.425	
	1581	-0.029	0.081	
	10000	-0.006	0.668	
Low selection	1	0.142	0	***
pressure	5	0.150	0	***
	158	0.157	0	***
	1581	0.204	0	***
	10000	0.215	0	***
Constant μ	1	0.399	0	***
	5	0.404	0	***
	158	0.409	0	***
	1581	0.520	0	***
	10000	0.533	0	***
No Migration	1	0.066	0	***
	5	0.066	0	***
	158	0.063	4.0 x 10 ⁻⁵	**
	1581	0.043	3.5 x 10 ⁻³	
	10000	0.024	0.117	
No Recombination	1	0.160	0	***
	5	0.162	0	***
	158	0.166	0	***
	1581	0.192	0	***
	10000	0.215	0	***

Table S5: Pearson's correlation tests for the association between the coefficient of background selection (B) and d_{XY-SNP} . P-values and r are computed on the simulations with BGS only.

Default 1 0.127 0 *** 5 0.116 0 *** 158 0.117 0 *** 1581 0.127 0 *** 10000 0.127 0 *** High Migration 1 0.089 0 *** 1581 0.098 0 *** 1581 0.098 0 *** 1581 0.098 0 *** 1581 0.092 0 *** 1581 0.092 0 *** 1581 0.092 0 *** 1580 0.247 0 *** 1581 0.221 0 *** 1581 0.221 0 *** 1581 0.025 4.4 x 10-4 * 1581 0.025 4.4 x 10-4 * 1581 0.025 4.4 x 10-4 * 1581 0.225 0 *** <th>Treatment</th> <th>Generation</th> <th>r</th> <th>P</th> <th>Bonferroni</th>	Treatment	Generation	r	P	Bonferroni
Septembor Sep		after split			
1581 0.117 0 *** 1581 0.127 0 *** 10000 0.127 0 *** High Migration 1 0.089 0 *** 158 0.098 0 *** 1581 0.092 0 *** 1580 0.250 0 *** 1580 0.247 0 *** 1580 0.231 0 *** 15810 0.242 0 *** 15810 0.242 0 *** 15810 0.242 0 *** 15810 0.225 0 *** 15810 0.242 0 *** 15810 0.242 0 *** 15810 0.258 0 *** 1581 0.071 0 *** 1581 0.022 0.167 *** 1581 0.022 0.167 *** 1581 0.118 0 *** 1581 0.118 0	Default	1	0.127	0	***
1581 0.127 0 *** 10000 0.127 0 *** 10000 0.127 0 *** 1581 0.098 0 *** 1581 0.098 0 *** 1581 0.092 0 *** 1581 0.092 0 *** 10000 0.150 0 *** 1580 0.247 0 *** 1580 0.247 0 *** 15810 0.242 0 *** 15810 0.242 0 *** 15810 0.258 0 *** 15810 0.258 0 *** 15810 0.070 0 *** 1581 0.070 0 *** 1581 0.022 0.167 1581 0.022 0.167 1581 0.022 0.167 1581 0.022 0.167 1581 0.092 8.0 x 10-5 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.256 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.042 6.5 x 10-3 1581 0.042 6.5 x 10-3 1581 0.042 6.5 x 10-3 1581 0.042 0.043 0.044 1581 0.042 0.045 0.045 1581 0.042 0.045 0		5	0.116	0	***
10000 0.127 0 *** High Migration		158	0.117	0	***
High Migration 1 0.089 0 *** 158 0.098 0 *** 1581 0.092 0 *** 1581 0.092 0 *** 10000 0.150 0 *** 10000 0.250 0 *** 1580 0.247 0 *** 1580 0.231 0 *** 1580 0.231 0 *** 1580 0.242 0 *** 1580 0.242 0 *** 1580 0.258 0 *** 1580 0.071 0 *** 1581 0.071 0 *** 1581 0.055 4.4 x 10-4 . 1581 0.022 0.167 *** 1581 0.022 0.167 *** pressure 5 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.256 0 <td></td> <td>1581</td> <td>0.127</td> <td>0</td> <td>***</td>		1581	0.127	0	***
Solution Solution		10000	0.127	0	***
158 0.098 0 *** 1581 0.092 0 *** 10000 0.150 0 *** 10000 0.150 0 *** 10000 0.250 0 *** 50 0.247 0 *** 1580 0.231 0 *** 15810 0.242 0 *** 100000 0.258 0 *** 100000 0.258 0 *** Human genetic 1 0.070 0 *** 158 0.055 4.4 x 10-4 . 1581 0.022 0.167 1581 0.022 0.167 10000 0.663 0 *** Low selection 1 0.092 8.0 x 10-5 * pressure 5 0.118 0 *** 158 0.101 0 *** 158 0.101 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.256 0 *** 1581 0.256 0 *** 1581 0.299 0 *** No Migration 1 0.117 0 *** 1581 0.299 0 *** 10000 0.305 0 *** No Migration 1 0.117 0 *** 1581 0.042 6.5 x 10-3 10000 *** 1581 0.042 6.5 x 10-3 10000 *** 1581 0.042 6.5 x 10-3 10000 *** No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 *** 158 0.265 0 *** 158 0.265 0 ***	High Migration	1	0.089	0	***
1581 0.092 0 *** 10000 0.150 0 *** Large N 10 0.250 0 *** 50 0.247 0 *** 1580 0.231 0 *** 15810 0.242 0 *** 15810 0.242 0 *** 100000 0.258 0 *** Human genetic 1 0.070 0 *** 1581 0.025 0.167 10000 0.063 0 *** Low selection 1 0.092 8.0 x 10-5 * pressure 5 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.119 0 *** No Migration 1 0.256 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** No Migration 1 0.117 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 ***		5	0.098	0	***
Large N 10 000 0.150 0.250 0 *** 50 0.247 0.250 0.247 0 *** 1580 0.231 0 0.248 0.231 0.242 0 *** 15810 0.242 0 0.258 0 *** 100000 0.258 0 0.258 0 *** Human genetic map 5 0.071 0 0 *** *** 1581 0.022 0.167 10000 0.063 0 *** *** 1581 0.022 0.167 10000 0.063 0 *** *** Low selection pressure 5 0.118 0 *** 0 *** 1581 0.118 0 *** 0 *** 1581 0.118 0 *** *** 1581 0.256 0 *** *** 1581 0.256 0 *** *** 1581 0.235 0 *** *** 1581 0.299 0 *** *** 1581 0.299 0 *** *** No Migration 1 0.117 0 *** *** 1581 0.042 6.5 x 10-3 10000 0.0305 0 *** 1581 0.042 6.5 x 10-3 10000 0.044 0 *** 1581 0.042 6.5 x 10-3 10000 0.044 0 *** No Recombination 1 0.249 0 *** 1581 0.265 0 0 *** 1581 0.265 0 0 ***		158	0.098	0	***
Large N 10 0.250 0 *** 50 0.247 0 *** 1580 0.231 0 *** 15810 0.242 0 *** 100000 0.258 0 *** Human genetic 1 0.070 0 *** 158 0.055 4.4 x 10-4 . 1581 0.022 0.167 10000 0.063 0 *** Low selection 1 0.092 8.0 x 10-5 * pressure 5 0.118 0 *** 158 0.101 0 *** 1581 0.118 0 *** 1581 0.118 0 *** Constant μ 1 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.265 0 *** No Migration 1 0.117 0 *** 158 0.108 0 *** 158 0.108 0 *** 158 0.108 0 *** 158 0.108 0 *** 158 0.244 0 *** 158 0.244 0 *** 158 0.265 0 ***		1581	0.092	0	***
To		10000	0.150	0	***
1580 0.231 0 *** 15810 0.242 0 *** 100000 0.258 0 *** Human genetic 1 0.070 0 *** map 5 0.071 0 *** 1581 0.022 0.167 10000 0.063 0 *** Low selection 1 0.092 8.0 x 10-5 * pressure 5 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.256 0 *** 1581 0.256 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.117 0 *** No Migration 1 0.117 0 *** No Migration 1 0.117 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 *** 158 0.265 0 ***	Large N	10	0.250	0	***
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		50	0.247	0	***
Human genetic map 100000 0.258 0 *** Human genetic map 1 0.070 0 *** 158 0.055 4.4 x 10-4 . 1581 0.022 0.167 . 10000 0.063 0 *** Low selection pressure 5 0.118 0 *** 158 0.101 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.256 0 *** 1581 0.256 0 *** 1581 0.299 0 *** 1581 0.299 0 *** 1581 0.107 0 *** 1581 0.108 0 *** 1581 0.042 6.5 x 10-3 *** 10000 -0.003 0.841 ***		1580	0.231	0	***
Human genetic map 1 0.070 0 *** map 5 0.071 0 *** 158 0.055 4.4×10^{-4} . 1581 0.022 0.167 . 10000 0.063 0 *** Low selection pressure 1 0.092 8.0×10^{-5} * 158 0.101 0 *** 158 0.101 0 *** 1581 0.118 0 *** 1581 0.118 0 *** 1581 0.121 0 *** 1583 0.256 0 *** 1584 0.235 0 *** 1581 0.299 0 *** 1581 0.299 0 *** No Migration 1 0.117 0 *** 1582 0.108 0 *** 1583 0.042 6.5 x 10-3 *** 1584 0.042 6.5 x 10-3 *** 1580 0.244		15810	0.242	0	***
map 5 0.071 0 *** 158 0.055 4.4 x 10-4 . 1581 0.022 0.167 . 10000 0.063 0 *** Low selection 1 0.092 8.0 x 10-5 * pressure 5 0.118 0 *** 1581 0.101 0 *** 1581 0.118 0 *** 1581 0.118 0 *** Constant μ 1 0.256 0 *** 158 0.235 0 *** 1581 0.299 0 *** 1581 0.299 0 *** No Migration 1 0.117 0 *** 158 0.108 0 *** 158 0.042 6.5 x 10-3 *** 159 0.244 0 *** 158 0.265 0 *** 158 0.265 0 *** 158 0.265 0 ***		100000	0.258	0	***
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Human genetic	1	0.070	0	***
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	тар	5	0.071	0	***
Low selection pressure 1 0.092 8.0 x 10-5 * 158 0.118 0 *** 158 0.101 0 *** 1581 0.118 0 *** 10000 0.121 0 *** Constant μ 1 0.256 0 *** 158 0.235 0 *** 1581 0.299 0 *** 1581 0.299 0 *** No Migration 1 0.117 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 *** 1581 0.042 6.5 x 10-3 *** 10000 -0.003 0.841 *** No Recombination 1 0.249 0 **** 158 0.265 0 *** 158 0.265 0 *** 158 0.265 0 ***		158	0.055	4.4 x 10 ⁻⁴	
Low selection pressure 1 0.092 8.0×10^{-5} * 158 0.101 0 *** 1581 0.118 0 *** 10000 0.121 0 *** Constant μ 1 0.256 0 *** 5 0.256 0 *** 158 0.235 0 *** 1581 0.299 0 *** 10000 0.305 0 *** 10000 0.305 0 *** 1581 0.107 0 *** 1581 0.042 6.5×10^{-3} *** 1581 0.042 6.5×10^{-3} *** 10000 -0.003 0.841 *** 1580 0.249 0 *** 1580 0.244 0 *** 1580 0.265 0 *** 1580 0.265 0 *** 1580 0.265 0 *** <		1581	0.022	0.167	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		10000	0.063	0	***
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Low selection	1	0.092	8.0 x 10 ⁻⁵	*
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	pressure	5	0.118	0	***
Constant μ 1 0.256 0 *** 158 0.256 0 *** 158 0.256 0 *** 158 0.235 0 *** 1581 0.299 0 *** 10000 0.305 0 *** No Migration 1 0.117 0 *** 158 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 *** 158 0.318 0 ***		158	0.101	0	***
Constant μ 1 0.256 0 *** 5 0.256 0 *** 158 0.235 0 *** 1581 0.299 0 *** 10000 0.305 0 *** No Migration 1 0.117 0 *** 158 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 ***		1581	0.118	0	***
No Migration 1 0.256 0 *** 1581 0.299 0 *** 10000 0.305 0 *** No Migration 1 0.117 0 *** 158 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 158 0.265 0 ***		10000	0.121	0	***
158 0.235 0 ***	Constant μ	1	0.256	0	***
No Migration 1 0.117 0 *** 1581 0.299 0 *** 10000 0.305 0 *** No Migration 1 0.117 0 *** 158 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 1581 0.318 0 ***		5	0.256	0	***
No Migration 1 0.117 0 *** 5 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 158 0.265 0 *** 1581 0.318 0 ***		158	0.235	0	***
No Migration 1 0.117 0 *** 5 0.121 0 *** 158 0.108 0 *** 1581 0.042 6.5 x 10-3 *** 10000 -0.003 0.841 *** No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ****		1581	0.299	0	***
No Recombination 1 0.117 0 *** 158 0.121 0 *** 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***		10000	0.305	0	***
158 0.108 0 *** 1581 0.042 6.5 x 10-3 *** 10000 -0.003 0.841 *** No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***	No Migration	1	0.117	0	***
No Recombination 1581 0.042 6.5 x 10-3 10000 -0.003 0.841 No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***		5	0.121	0	***
10000 -0.003 0.841 No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***		158	0.108	0	***
No Recombination 1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***		1581	0.042	6.5 x 10 ⁻³	
1 0.249 0 *** 5 0.244 0 *** 158 0.265 0 *** 1581 0.318 0 ***		10000	-0.003	0.841	
158 0.265 0 *** 1581 0.318 0 ***	No Recombination	1	0.249	0	***
1581 0.318 0 ***		5	0.244	0	***
1301 0.310 0		158	0.265	0	***
10000 0.353 0 ***		1581	0.318	0	***
		10000	0.353	0	***