Supplementary Information
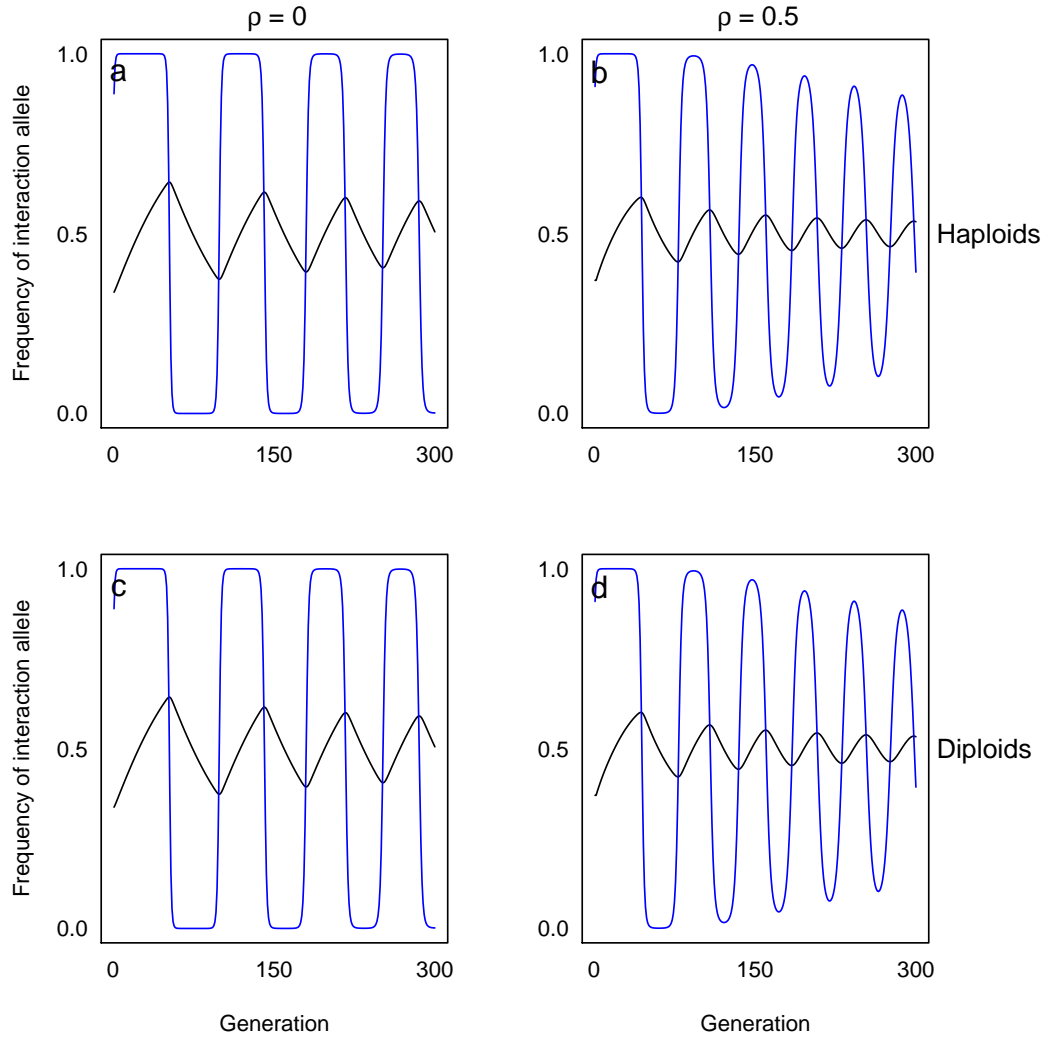

Figure S1: Allele frequency dyanamics at the interaction-locus in the host (black) and parasite (blue) populations during co-evolution under the IMA infection model and animal mating model. Cycle dynamics are shown for two strengths of disassortative mating (ρ), in haploid hosts with haploid parasites (top row), and in diploid hosts with diploid parasites (bottom row).
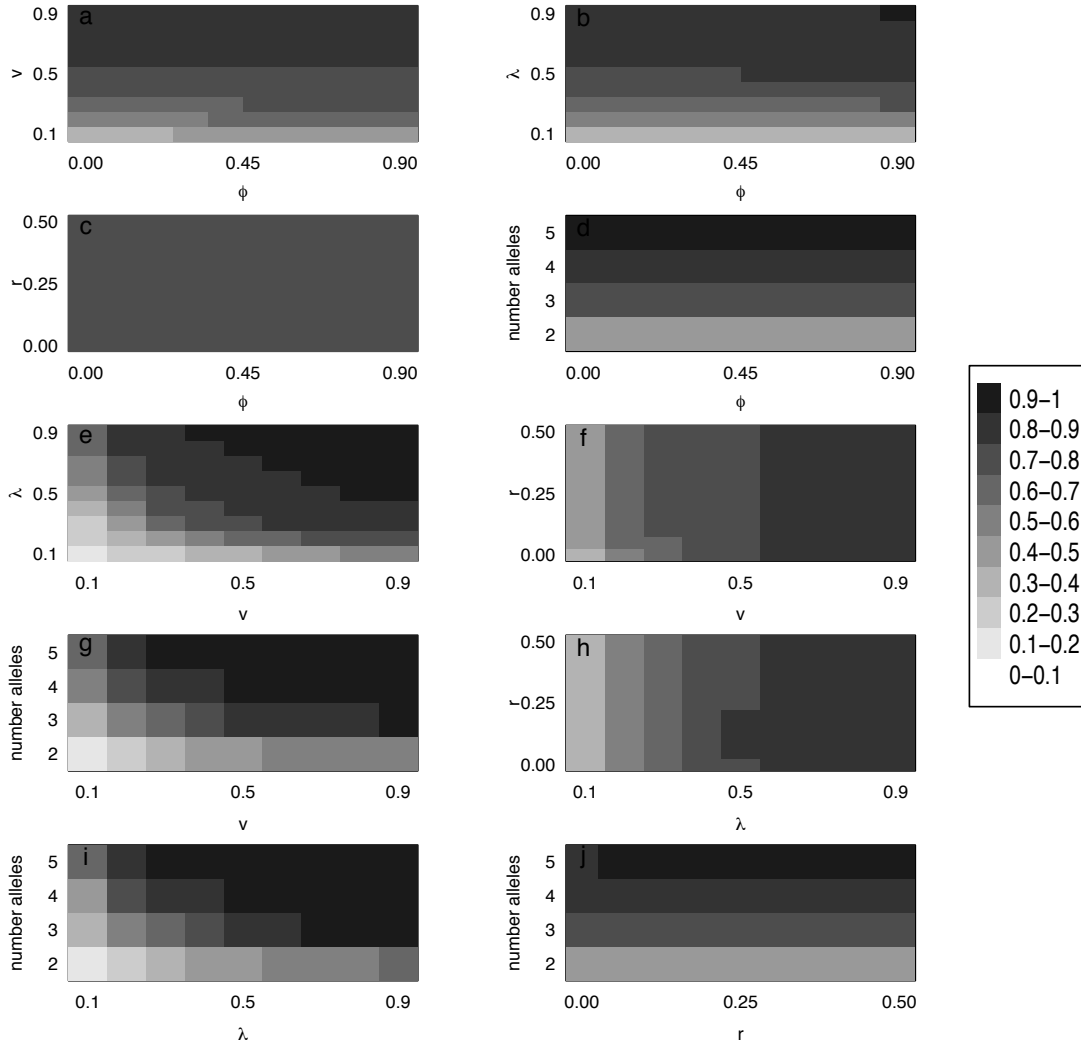
Figure S2: Contour plots of the $\overline{ESS}$ level of disassortative mating in diploids as a function of strength of maternal transmission, ϕ; virulence, v; probability of infection, λ, recombination rate, r, and the number of alleles at the interaction-locus in all pairwise combinations for the case that corresponds to the MHC. For each of the parameter pairs, $\overline{ESS}$ is defined as the mean ESS taken over the range of combinations of the other parameters (see Table S6) with the focal parameters fixed at the corresponding values on the horizontal and vertical axes.
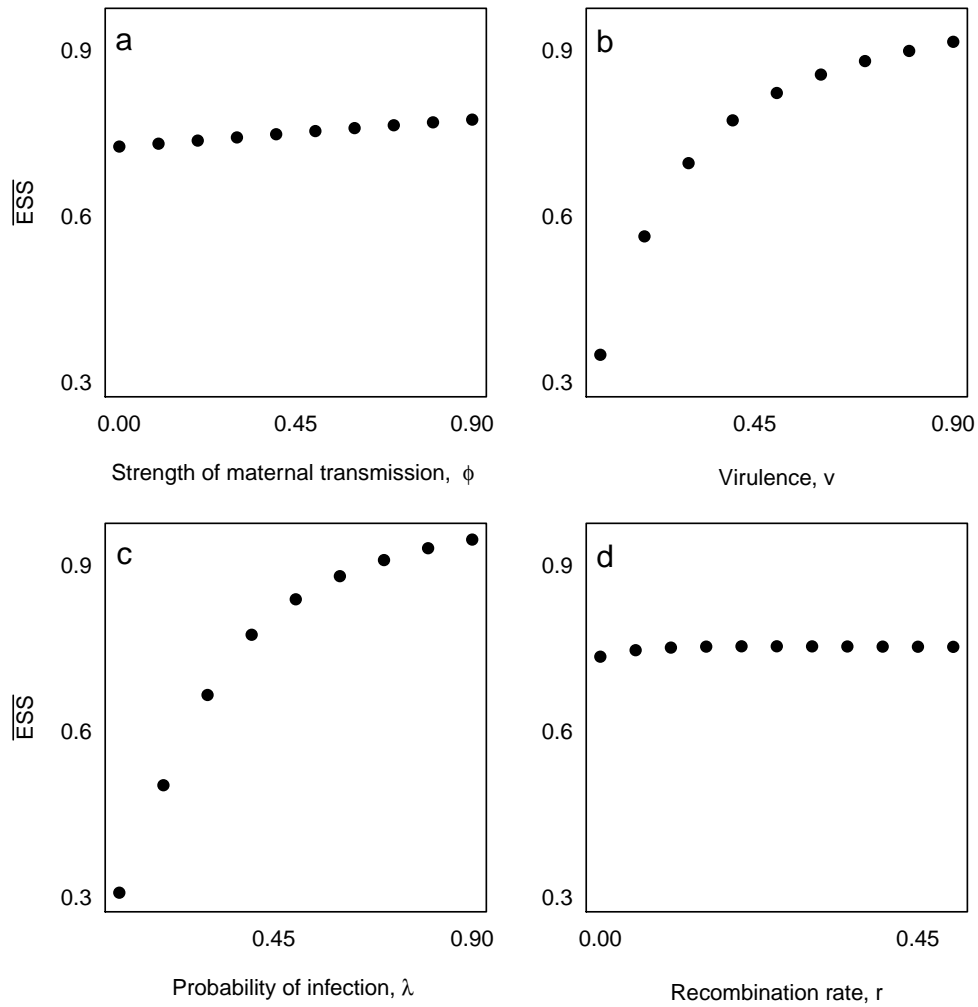
Figure S3: The $\overline{ESS}$ as a function of the rate of maternal transmission (a), virulence (b), the probability of infection (c), and the rate of recombination (d) with 3 alleles at the interaction-locus. All else is as described in Fig. 2 of the main text.

	Host genotype	
Parasite genotype	A	a
B	{R,I}	{I,R}
b	{I,R}	{R,I}

Table S1: Models of infection in haploid hosts and haploid parasites. The first entry is for the IMA model and the second for the MA model. Host resistance occurs in cells labeled "R" and infection occurs in cells labeled "I".

| | Host genotype | | |
Parasite genotype	AA	Aa	aa
B	{R,I}	{R,I}	{I,R}
b	{I,R}	{R,I}	{R,I}

Table S2: Models of infection in diploid hosts with haploid parasites. The first entry is for the IMA model and the second for the MA model. Host resistance occurs in cells labeled "R" and infection occurs in cells labeled "I".

	Host genotype	
Parasite genotype	A	a
BB	{R,I}	{I,R}
Bb	{R,R}	{R,R}
bb	{I,R}	{R,I}

Table S3: Models of infection in haploid hosts and diploid parasites. The first entry is for the IMA model and the second for the MA model. Host resistance occurs in cells labeled "R" and infection occurs in cells labeled "I".

| | Male genotype | |
Female genotype	A	a
A	$1 - (1 - \omega) * \rho(\mathbf{X})$	$1 - \omega * \rho(\mathbf{X})$
a	$1 - \omega * \rho(\mathbf{X})$	$1 - (1 - \omega) * \rho(\mathbf{X})$

Table S4: Relative preferences of females for males under assortative ($\omega = 1$) or disassortative ($\omega = 0$) mating in plant and animal models when hosts are haploids.

	Genotype	
Group	A	a
A	1	0
a	0	1

Table S5: Grouping model probabilities in haploids.

Parameter	Set
ϕ	$\{0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9\}$
v	$\{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9\}$
λ	$\{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9\}$
r	$\{10^{-7}, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.45, 0.5\}$

Table S6: Parameter values used for generating Table 5 and Figure 1.