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Supplementary Materials for

Evolutionary divergence in competitive mating success through female mating bias for good genes

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This PDF file includes:

SUPPLEMENTARY MATERIALS

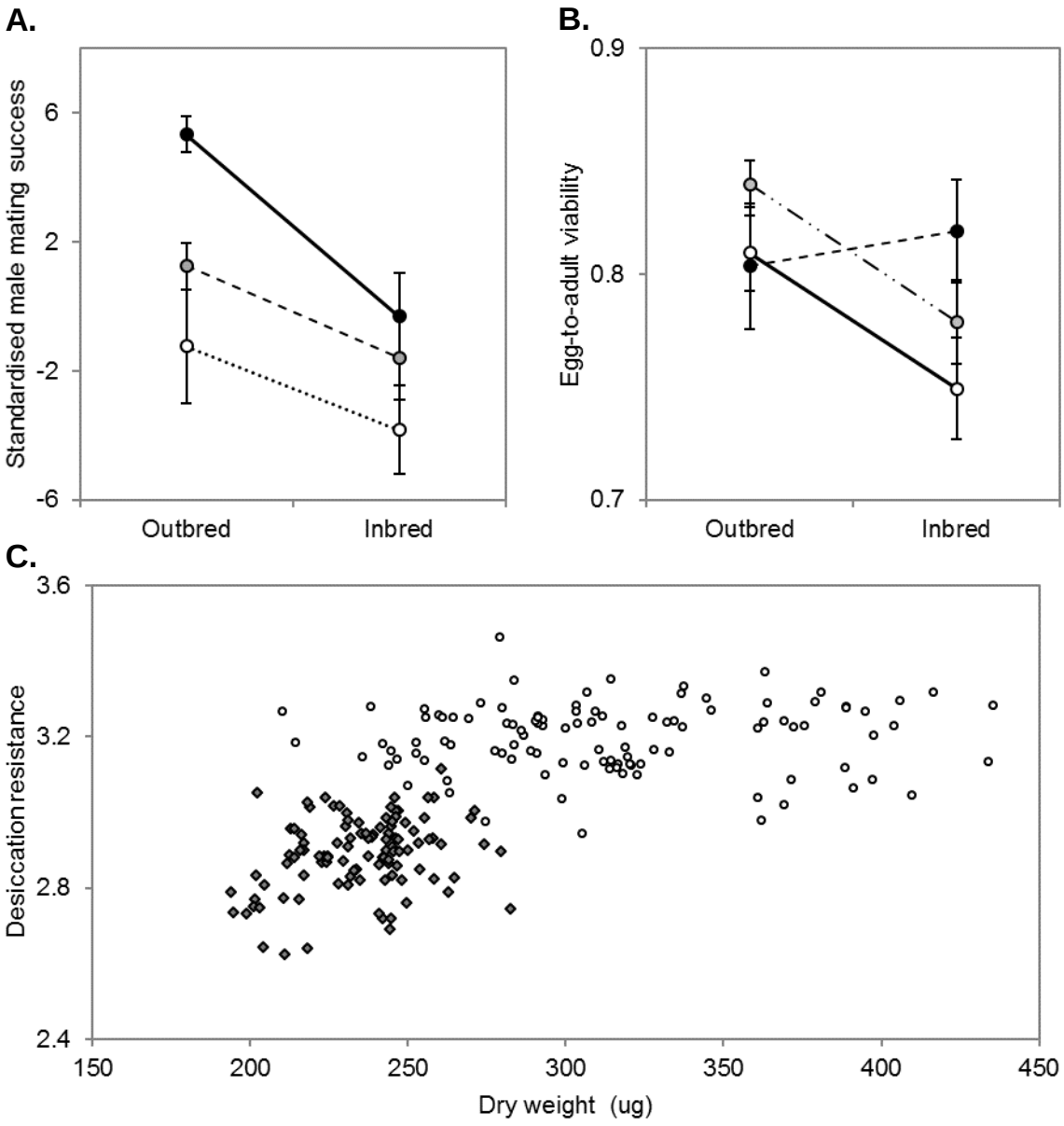

fig. S1. Effect of selection regimen, inbreeding, and sex on fitness-related traits from experimental, control, and stock populations. (A) Standardised mean (±SE) male mating success of outbred and inbred success-selected (black), failure-selected (white), and control (grey) flies. Mating success of the lines was standardised by the mean and SD of the total proportion of experimental males that mated on each of four consecutive days. (B) Mean (±SE) egg-to-adult viability of outbred and inbred success-selected (black), failure-selected (white) and control (grey) flies. (C) Desiccation resistance (log minutes to death) and weight of male (grey squares) and female (white circles) flies from the stock population.

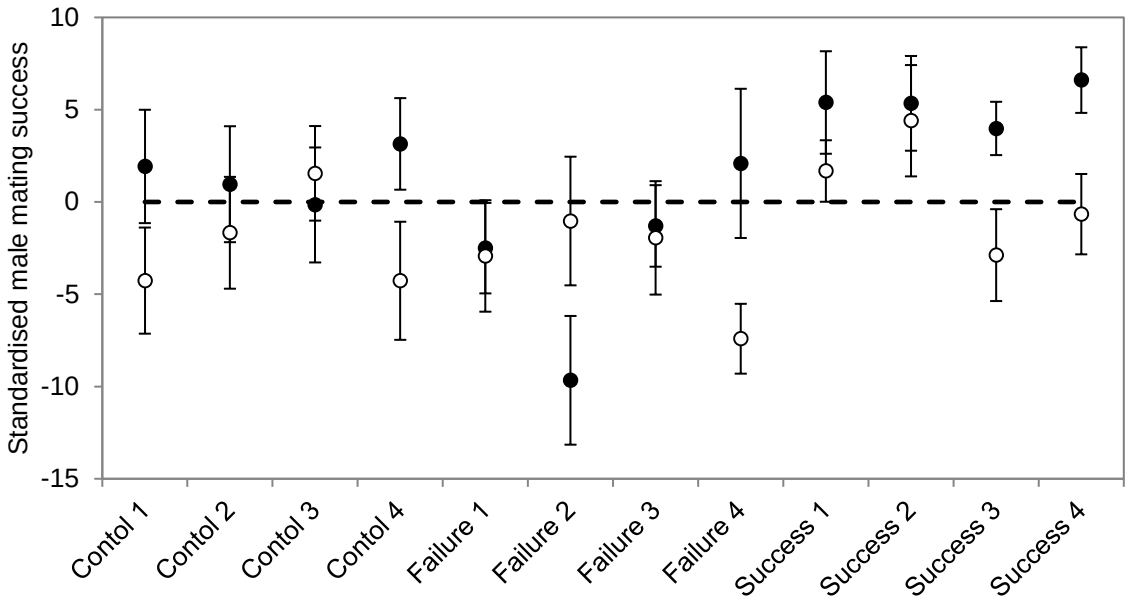

fig. S2. Standardized male mating success of outbred (black) and inbred (white) flies from the 12 selection/control lines. Points represent the mean (±SE) proportion of matings across the 10 families for each cross/line. Mating success of the lines was standardised by the mean and SD of the total proportion of experimental males that mated on each of four consecutive days.

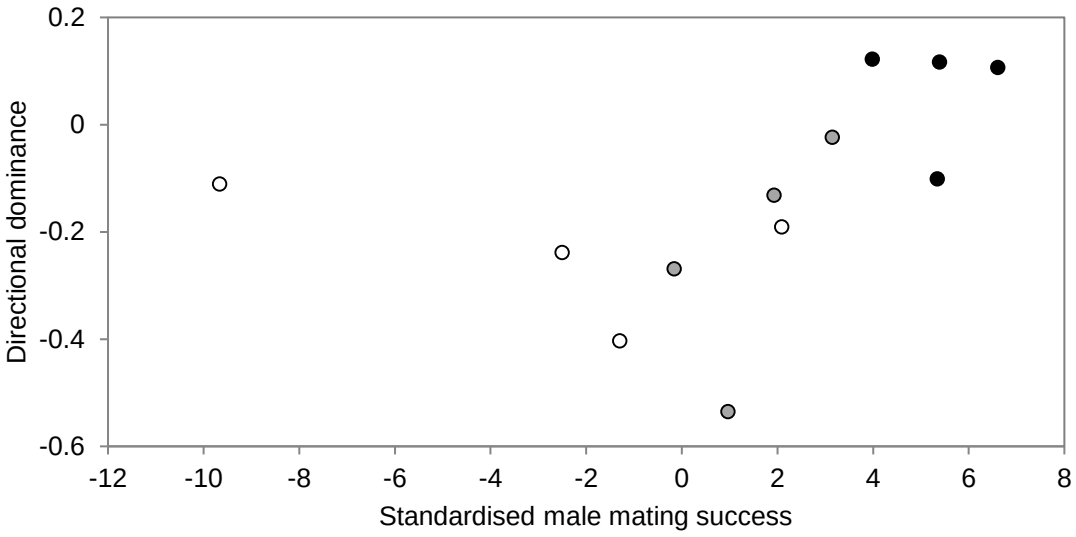

fig. S3. Relationship between standardized male mating success inbreeding load. Inbreeding load is quantified as the inbreeding depression in egg-to-adult viability and is calculated as $(M_I-M_O)/F$ where, for each line (success-selected (black), control (grey) and failure-selected (white)), M_I is the viability of inbred flies, M_O is the viability of outbred flies and F is the inbreeding coefficient, ~0.25. Note that more negative values of direction dominance indicate a larger load of deleterious recessive mutations.

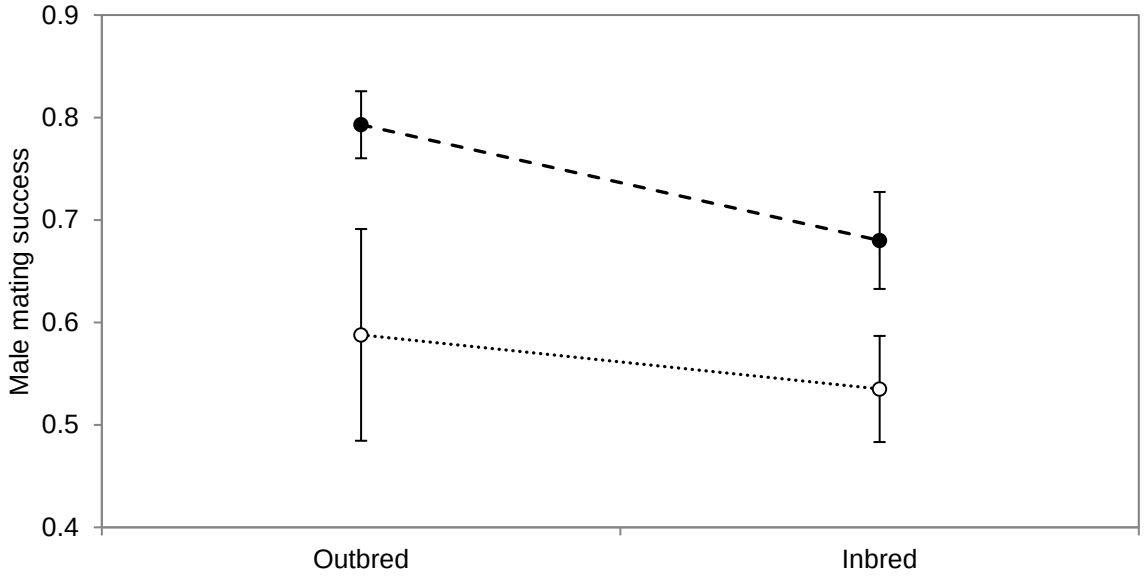

fig. S4. Male mating success of outbred and inbred flies from success-selected (black circles) and failure-selected (white circles) populations. Means and SEs are of the four replicate selection lines for each selection regimen, and are weighted by the number of matings per line. Note that the values are not standardised by day as with Fig. 1A.

table S1. Effect of selection regimen, inbreeding (cross), and their interaction on male mating success of all lines, success-selected *v* control lines, and failure-selected *v* control lines. Model 1 is a generalised linear mixed model that was analysed with a randomisation test (1,000 permutations). Bold font indicates significance at $\alpha = 0.05$.

				P	
Trait	Source	d.f.	χ^2	Model 1	Randomisation
Male mating success	Regimen	2	10.35	**0.006**	**0.001**
(All lines)	Cross	1	7.6	**0.006**	**0.004**
	Regimen x Cross	2	1.44	0.488	0.306
Male mating success	Regimen	1	5.56	**0.018**	**0.045**
(Success-selected v control)	Cross	1	8.9	**0.003**	**0.001**
	Regimen x Cross	1	0.17	0.684	0.633
Male mating success	Regimen	1	1.3	0.255	0.250
(Failure-selected v control)	Cross	1	2.75	0.097	0.102
	Regimen x Cross	1	0.60	0.438	0.456

table S2. Effect of sex, weight, and their interaction on the desiccation resistance of males and females from the stock population. Model 1 is a linear mixed model that was analysed with a randomisation test (1,000 permutations). Bold font indicates significance at $\alpha = 0.05$.

				P	
Trait	Source	d.f.	χ^2	Model 1	Randomisation
Desiccation resistance	Sex	1	157.78	**<0.001**	**<0.001**
(Stock population)	Weight	1	3.06	0.080	0.082
	Sex x Weight	1	5.36	**0.021**	**0.015**

table S3. Effect of selection regimen, inbreeding (cross), and their interaction on wing size and egg-to-adult viability of size-selected lines. Model 1 is a generalised linear mixed model and model 2 is a linear mixed model. Each model was also analysed with a randomisation test (1,000 permutations). Bold font indicates significance at $\alpha = 0.05$.

				P		
Trait	Source	d.f.	χ^2	Model 1	Model 2	Randomisation
Egg-to-adult viability *(large v small)*	Regimen	1	6.26	**0.012**		**0.008**
	Cross	1	7.79	**0.003**		**0.004**
	Regimen x Cross	1	0.03	0.777		0.778
Wing size	Regimen	1	29.00		**<0.0001**	**<0.0001**

table S4. Sample sizes for all measured traits.

Assay		Control		Success-selected		Failure-selected	
		Outbred	Inbred	Outbred	Inbred	Outbred	Inbred
Male mating success	N families	39	40	40	40	37	39
	N wins	111	100	157	119	87	84
	N losses	49	69	41	56	61	73
Egg-to-adult viability	N families	20	20	20	20	20	20
	N vials	86	88	93	88	91	90
	N eggs	4281	4673	5048	4796	4616	4702
	N adults	3595	3639	4056	3928	3736	3523
Sperm competitiveness	N families			24		23	
	N vials			28		34	
	N wild-type offspring			1567		1797	
	N brown-eyed offspring			64		239	
Larval competitiveness	N vials			20		20	
Desiccation resistance	N female vials			41		39	
	N females			400		383	
	N male vials			41		40	
	N males			389		374	
Desiccation resistance (stock)	N females	107					
	N males	106					
Wing area	N vials			20		20	
	N males			100		100	