Plastic responses of male *Drosophila melanogaster* to the level of sperm competition increase male reproductive fitness

Amanda J. Bretman[1, 2], Claudia Fricke[1] and Tracey Chapman[1, 3]

1. School of Biological Sciences, University of East Anglia, Norwich, Norfolk, NR4 7TJ, UK.

2. Centre for Ecology and Conservation, School of Biosciences, University of Exeter, Cornwall Campus, Penryn, Cornwall, TR10 9EZ, UK.

3. Author for correspondence: Tracey Chapman (tracey.chapman@uea.ac.uk)

Tel: +44 (0) 1603 593210

Fax: +44 (0) 1603 592250

Email: tracey.chapman@uea.ac.uk

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Electronic supplementary material

Figure S1 Effect of male responses to the previous or current level of sperm competition on first mating latency.

Latency to mate (mean minutes ± se) for males kept for 5 days prior to mating in groups of 1, 2 or 4 males (previous treatments) and then placed 1, 2 or 4 males per vial in the mating arena (current treatments). Combining probabilities across all 3 experiments confirmed that mating latency showed a consistent and significant decrease when competitor males were present in the mating arena ($p < 0.0001$) and revealed more strongly the tendency for latency to decrease with increasing exposure to other males before mating ($p = 0.03$).

Figure S2 Effect of male responses to the previous or current level of sperm competition on female fecundity and egg-adult survival.

(a) Number of eggs laid between matings (mean ±se) over 24h of females first mated to males experiencing low or high levels of sperm competition in the P1 experiment. Males were kept for 5 days prior to mating in groups of 1 or 4 males (previous treatments) and then placed 1 or 4 males per vial in the mating arena (current treatments). (*b*) Box plot of the egg-adult viability of the eggs shown in (*a*).

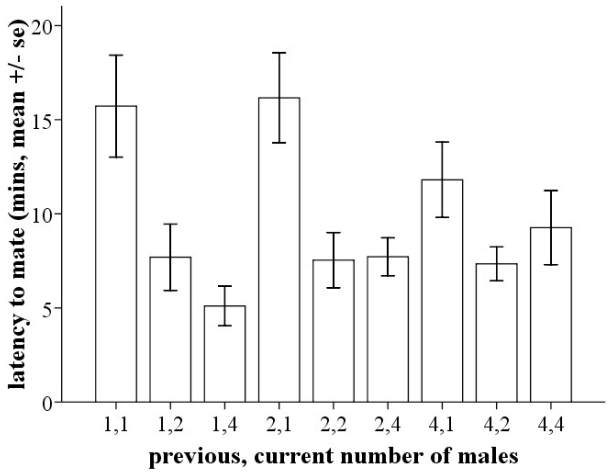
latency to mate (mins, mean +/- se)
20
15
10
5
0
1,1
1,2
1,4
2,1
2,2
2,4
4,1
4,2
4,4
previous, current number of males

Figure S1

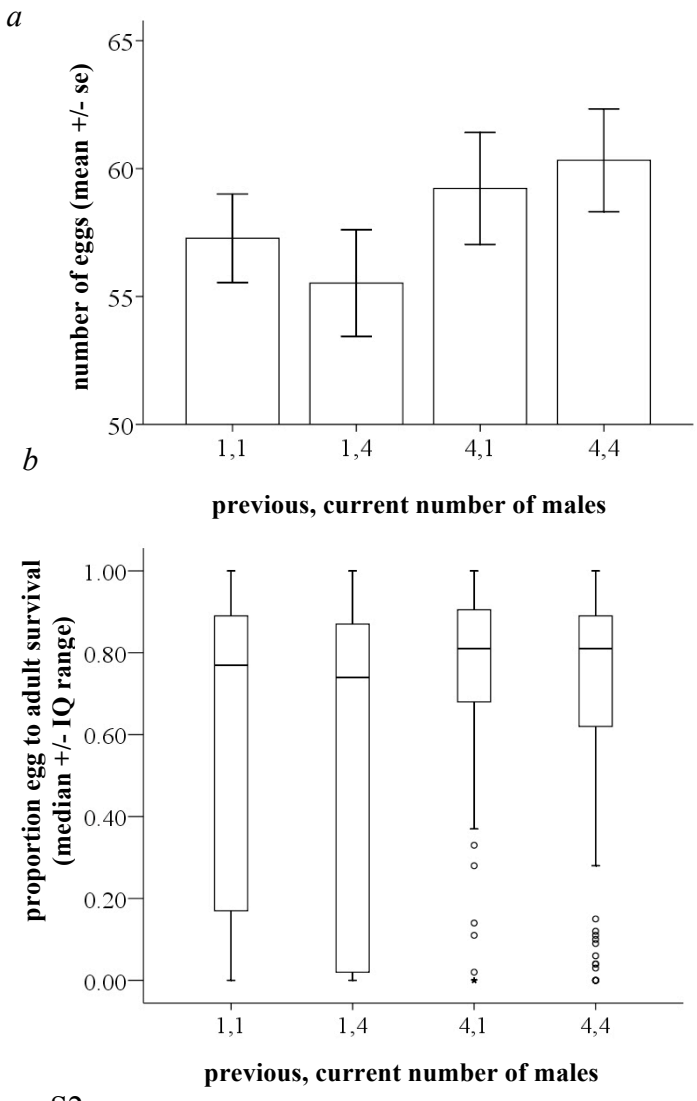
a
number of eggs (mean +/- se)
65
60
55
50
1,1
1,4
4,1
4,4
previous, current number of males
b
proportion egg to adult survival
(median +/- IQ range)
1.00
0.80
0.60
0.40
0.20
0.00
1,1
1,4
4,1
4,4
previous, current number of males

Figure S2

Table S1. Analysis of progeny number fathered by males responding to high and low levels of sperm competition.

Analysis of the number of first and second mating male progeny fathered, following the second mating, for low and high SC treatment males in the P1 and P2 experiments. Males were kept for 5 days from eclosion in groups of 1 or 4 males (previous treatments) and then placed 1 or 4 males per vial in the mating arena (current treatments). In the P1 experiment, *sepia* females were first mated to low and high SC males and then 24h later to a *sepia* male. In the P2 experiment, the mating order was reversed. For the analysis of the P1 experiment data we used a Scheirer Hare test as data were non-normal and showed heterogeneity of variance. For the P2 data analysis we used a two factor ANOVA.

	P1 experiment			P2 experiment			
Source	d.f.	SS/MS_{total} ratio	*p*	d.f.	*MS*	*F*	*p*
Previous	1	5.746	0.017	1	3585.28	1.62	0.205
Current	1	2.543	0.111	1	5273.37	2.39	0.124
Previous*current	1	0.352	0.352	1	2044.05	0.93	0.337

Table S2. Analysis of the proportion of progeny fathered by males responding to high and low levels of sperm competition. Summary of the output of the data analysis from 3 different statistical models.

(a) is reproduced for comparison and is the model presented in Table 1 of the main ms. It shows the output of a GLM with previous and current number of males as fixed factors. (b) shows the results of a GLM with arcsine transformed data and fecundity (number of eggs laid between first and second matings) used to weight the data, and (c) shows the output of a model using arscine transformed proportions and Gaussian error structure (note though that the error structure was not normal and this model has perhaps the least applicability). Each factor has 1 degree of freedom.

Model	Source	P1 experiment		P2 experiment	
		F	*p*	*F*	*p*
(a) Quasibinomial errors	Previous	7.5	0.007	9.56	0.002
	Current	2.13	0.15	3.90	0.05
	Previous*current	2.24	0.14	0.30	0.59
(b) Arcsine with fecundity weights	Previous	9.01	0.003	7.60	0.006
	Current	2.36	0.13	2.84	0.09
	Previous*current	2.54	0.11	1.84	0.18
(c) Arcsine Gaussian errors	Previous	6.43	0.002	1.46	0.24
	Current	1.16	0.31	2.52	0.08
	Previous*current	1.69	0.20	0.62	0.43