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Supplementary information

Sex-specific density-dependent secretion of glucocorticoids in lizards: insights from laboratory and field experiments**.**

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Supplementary tables

Table S1. Experimental design of the density and sex ratio factorial manipulation in semi-natural conditions. Numbers refer to the number of individuals of each age class and sex released in each experimental population. FB refers to female biased and MB to male biased. All yearling and adult males and females were released in the enclosure on July 8 and 9 2009. All juveniles were released a day after birth between June 16 and July 3 2009.

	Density level 1		Density level 2		Density level 3	
Number of individuals released	FB	MB	FB	MB	FB	MB
Adult females	3	1	6	2	9	3
Adult males	1	3	2	6	3	9
Yearling females	3	2	6	4	9	6
Yearling males	3	4	6	8	9	12
Juvenile females	6	6	12	12	18	18
Juvenile males	6	6	12	12	18	18

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Table S2. Monitoring of individuals in the density and density-sex ratio experiments. In the density-sex ratio experiment, numbers of yearling and adult males recaptured in each treatment on each recapture day were too low to test for age effects. However, no significant age effects were found when tested in the density experiment (see Table 1 in the main text).

	Density experiment	Density × sex ratio experiment
Session 1: pre-experimental levels	June 7-8 2008	June 21 July 6 2009
Conditions	Laboratory	Laboratory
Number of adult males	54	89
Number of adult females	0	0
Number of yearling males	94	0
Number of yearling females	73*	0
Session 2: early summer	June 19 - 26 2008	
Conditions	Semi-natural	
Time since release (days)	11.4 ± 2.9	
Number of adult males	21	
Number of adult females	0	
Number of yearling males	51	
Number of yearling females	25	
Session 3: late summer	September 9 -15 2008	
Conditions	Semi-natural	
Time since release (days)	84.4 ± 12.8	
Number of adult males	10	
Number of adult females	21	
Number of yearling males	34	
Number of yearling females	32	
Session 4: mating season	April 27 - May 1 2009	April 27-28 2010
Conditions	Semi-natural	Semi-natural
Time since release (days)	148.3 ± 13.3	127.7 ± 4.4
Number of adult males	9	31
Number of adult females	13	8
Number of yearling males	14	54
Number of yearling females	28	13
Session 5: post-experimental levels	May 20 - July 4 2009	June 1-2 2010
Conditions	Laboratory	Laboratory
Time since release (days)	194.2 ± 21.4	161.9 ± 0.7
Number of adult males	9	57
Number of adult females	10	0
Number of yearling males	18	109
Number of yearling females	28	0

* Potentially pregnant yearling females were kept in the laboratory until their reproductive status was confirmed before being sampled for blood between June 14 and July 25.

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Table S3. Estimates of the effects of population density and sex ratio, body mass, date, time since release and time of the day (quadratic regression) on corticosterone levels at each sampling session in the density and sex ratio experiment. Results are from the minimum adequate models displayed in Table 1 in the main text. MB refers to male-biased. Sampling date 2 refers to the second sampling day in April and in June-July.

	June 21 - July 6 2009	April 27-28 2010	June 1-2 2010
Fixed effects	Estimate ± s.e.	Estimate ± s.e.	Estimate ± s.e.
Intercept	18.47 ± 1.63	3.74 ± 1.17	15.64 ± 4.51
Density level 2	-	7.48 ± 4.98	0.64 ± 5.22
Density level 3	-	12.67 ± 2.68	9.41 ± 5.27
Sex ratio MB	-	6.97 ± 2.07	7.20 ± 4.33
Density level 2 : sex ratio MB	-	-8.26 ± 5.49	-8.95 ± 5.87
Density level 3 : sex ratio MB	-	-15.13 ± 3.28	-18.05 ± 6.36
Body mass (g)	-	2.83 ± 1.35	-
Sampling date 2	-	3.15 ± 1.55	6.55 ± 2.54
Time since release (days)	-	-	-4.95 ± 1.85
Time of the day (hours)	0.04 ± 0.42	-1.95 ± 0.46	0.31 ± 0.79
Time of the day (hours)^2	-0.76 ± 0.23	-	-2.81 ± 0.73

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Supplementary figures

Figure S1. Corticosterone levels of male common lizards recaptured in September 2008 in the density experiment. Data are observed corticosterone levels in semi-natural conditions according to the number of adult and yearling males (A) and females (B) released in the enclosures in summer 2008 with the regression lines estimated from the minimum adequate models (see main text). $n = 44$. Adjusted $R^2 = 0.31$ in (A) and 0.31 in (B).

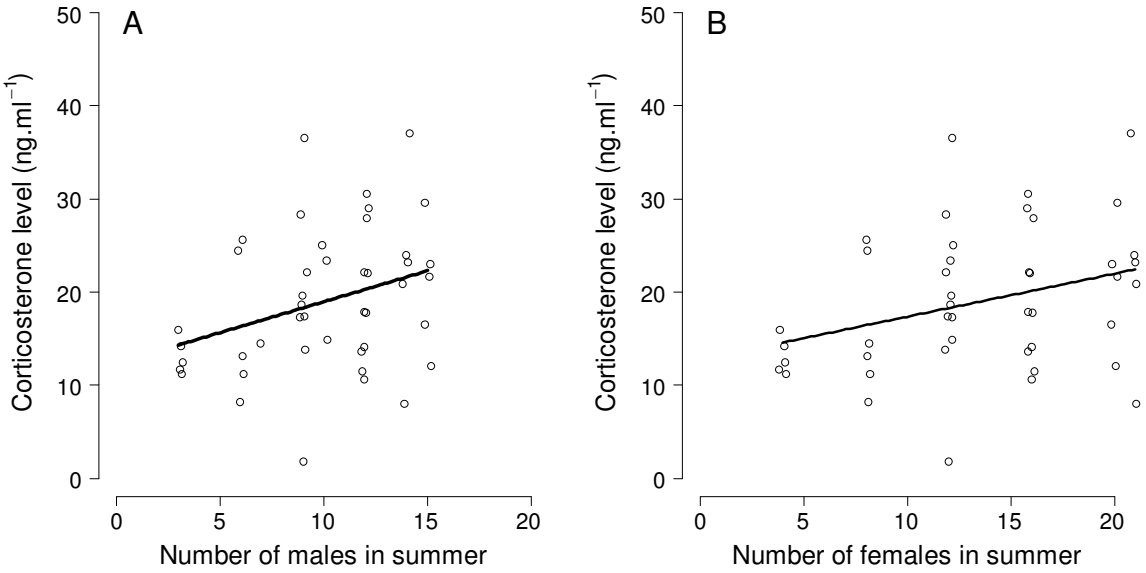

Figure S2. Corticosterone levels of male common lizards recaptured in the density and sex ratio manipulation in April 2010 (A) and June 2010 (B) according to the number of adult females in each population in late spring. Data are observed corticosterone levels in semi-natural conditions. (A) Regression lines were estimated from the minimum adequate model (see main text). (B) Regression lines were estimated from the minimum adequate model to which was added a linear and quadratic effect of the number of females. MB: male-biased, FB: female-biased. Adjusted $R^2 = 0.41$ in (A) and 0.05 in (B).

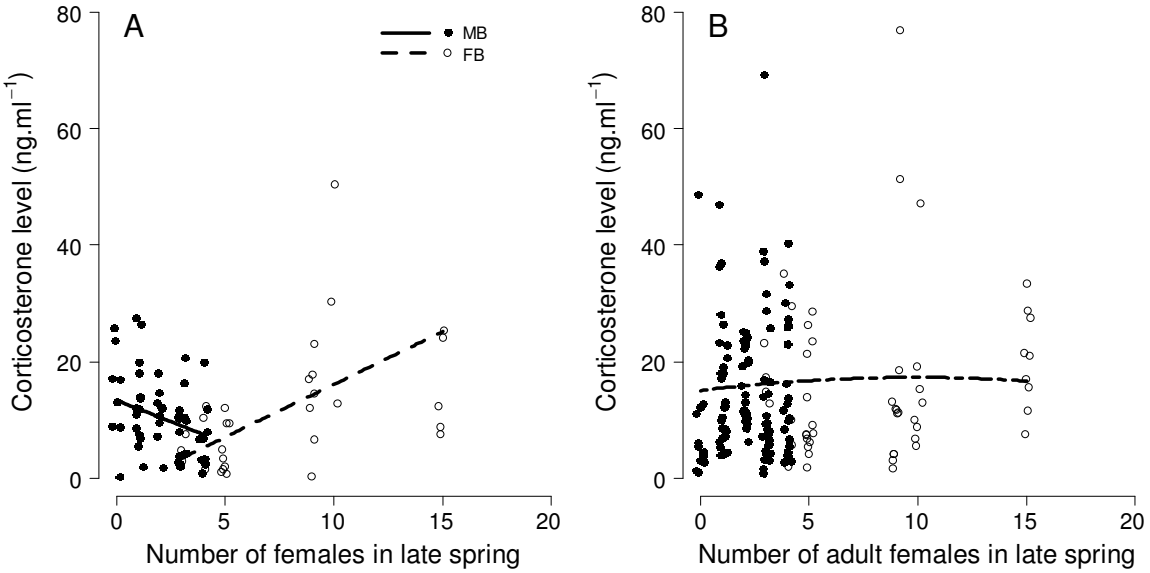

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Figure S3. Corticosterone levels of the 21 female common lizards recaptured in the density and sex ratio manipulation in April 2010 according to the number of adult males in each population. Data are observed corticosterone levels in semi-natural conditions with the regression line estimated from the minimum adequate model (see main text). MB: male-biased, FB: female-biased. Adjusted $R^2 = 0.49$.

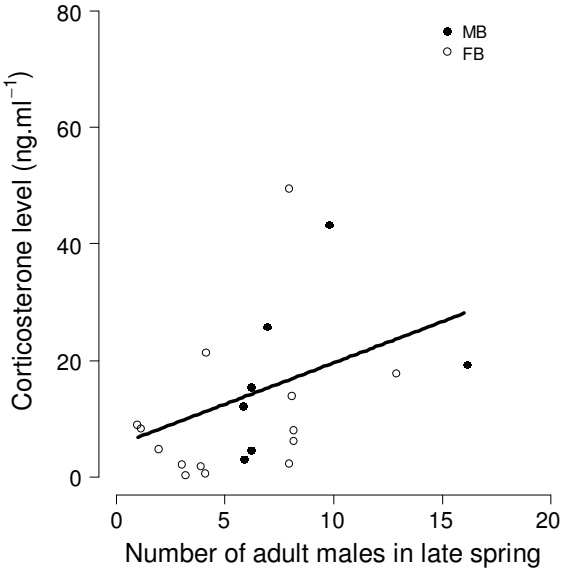

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Figure S4. Seasonal variation of corticosterone levels in males and females in the density manipulation (A) and in males in the density × sex ratio manipulation (B). Data are mean ± se from raw values. In (A), the sex differences seen in June 2008 were driven by differences in body mass and sampling date (see Table 1 in the main text).