SUPPLEMENTAL DATA

Table S1.
Part 1 sample sizes of *M. septendecim* (MS) *M. cassini* (MC) by species, sex, and treatment.

Sample	Young males	Young females	Old males	Old females
MS initial samples	49	49	57	56
MS head width	49	49	57	56
MS implant darkness	49	47	54	54
MS implant thickness	49	47	55	55
MC initial samples	49	50	55	53
MC head width	49	50	55	53
MC implant darkness	47	50	52	53
MC implant thickness	50	50	53	51

Table S2.
Part 1 differences in head width by species and sex. An ANOVA was used to determine the effect of species, sex, and species*sex on head width. A post-hoc Tukey's HSD was used to determine differences between groups, and differences in letter (A-D) represent differences among groups. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Variable	F	df	*P*
Species	288.6	1,193	**< 0.0001**
Sex	173.8	1,193	**< 0.0001**
Species*sex	2.72	1,193	0.10
Full model	154.3	3,193	**< 0.0001**

Species, sex	Mean ± 1 SE	Tukey's HSD
MS females	4.63 ± 0.025	A
MS males	4.34 ± 0.025	B
MC females	4.25 ± 0.025	C
MC males	3.88 ± 0.025	D

Table S3.
Part 1 effect of head width on implant darkness and implant thickness by species and sex. Each cell shows the results of a linear regression of head width on implant darkness or thickness. Values that are statistically significant at a level of *P* < 0.05 are in bold text. *MS females with wider heads had less thick implants.

Species, sex	Implant darkness			Implant thickness		
	F	df	p	F	df	p
MS males	0.86	1,47	0.36	2.87	1,47	0.097
MS females	1.25	1,47	0.27	6.59	1,45	**0.014***
MC males	0.49	1,45	0.49	3.56	1,47	0.066
MC females	0.0002	1,48	0.99	1.12	1,48	0.29

Table S4.

Part 1 effect of young adult block on implant darkness and implant thickness by species and sex. Nonparametric Wilcoxon/Kruskal-Wallis X^2 tests were used to determine the differences between young adult blocks in implant darkness. ANOVAs were used to determine differences between young adult blocks in implant thickness. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Species, sex	Implant darkness		Implant thickness		
	X^2	*P*	F	df	*P*
MS males	19.7	**< 0.0001**	6.69	1,47	**0.013**
MS females	0.50	0.48	10.8	1,45	**0.0019**
MC males	0.91	0.34	15.9	1,48	**0.002**
MC females	0.81	0.37	11.0	1,48	**0.0017**

Table S5.

Part 1 effect of adult age on implant darkness. Nonparametric Wilcoxon/Kruskal-Wallis χ^2 tests were used to determine the effect of adult age on implant darkness in each block of MS males. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Species, sex, block	χ^2	*P*
MS males block 1	33.5	**< 0.0001**
MS males block 2	7.27	**0.0070**

Table S6.

Part 1 effect of sex and age on implant thickness, by young adult block. For each species and block, an ANOVA was performed with sex, age, and sex*age as independent variables and implant thickness as the dependent variable. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Species and block	variable	F	df	*P*
MS block 1	sex	18.0	1, 153	**< 0.0001**
	age	30.9	1, 153	**< 0.0001**
	sex*age	0.0013	1, 153	0.97
	full model	17.1	3, 153	**< 0.0001**
MS block 2	sex	18.7	1, 155	**< 0.0001**
	age	2.9	1, 155	0.091
	sex*age	0.012	1, 155	0.91
	full model	8.5	3, 155	**< 0.0001**

MC block 1	sex	91.7	1, 150	**< 0.0001**
	age	71.9	1, 150	**< 0.0001**
	sex*age	7.2	1, 150	**0.0079**
	full model	69.1	3, 150	**< 0.0001**
MC block 2	sex	108.2	1, 150	**< 0.0001**
	age	13.3	1, 150	**0.0004**
	sex*age	5.04	1, 150	**0.026**
	full model	54.0	3, 150	**< 0.0001**

Table S7.

Part 2 samples sizes by species, sex, and treatment.

Sample	Virgin males	Mating males	Virgin females	Mating females
MS initial samples	46	41	31	33
MS head width	41	40	31	33
MS implant darkness	40	41	30	32
MS implant thickness	39	40	30	32
MC initial samples	44	38	42	39
MC head width	40	32	42	38
MC implant darkness	37	32	36	38
MC implant thickness	39	31	39	38

Table S8.

Part 2 effect of head width on implant darkness and implant thickness by species and sex. Each cell shows the results of a linear regression of head width on implant darkness or thickness.

Species, sex	Implant darkness			Implant thickness		
	F	df	*P*	F	df	*P*
MS males	0.056	1,78	0.81	0.11	1,76	0.74
MS females	0.008	1,60	0.93	3.71	1,60	0.069
MC males	0.002	1,67	0.96	1.10	1,68	0.30
MC females	0.25	1,72	0.62	0.23	1,75	0.63

Table S9.

Part 2 effect of mating opportunity treatment on implant darkness. Nonparametric Wilcoxon/Kruskal-Wallis χ^2 tests were used to determine the effect of mating treatment on implant darkness.

Species, sex	Implant darkness	
	χ^2	*P*
MS males	0.13	0.73
MS females	0.89	0.35
MC males	0.42	0.52
MC females	1.96	0.16

Table S10.

Part 2 effect of sex and mating opportunity treatment on implant thickness, by species. For each species, an ANOVA was performed with sex, mating, and sex*mating as independent variables and implant thickness as the dependent variable. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Species	Variable	F	df	*P*
MS	sex	14.6	1,139	**0.0002**
	mating	0.27	1,139	0.60
	sex*mating	0.045	1,139	0.83
	full model	5.0	3,139	**0.0025**
MC	sex	19.0	1,139	**< 0.0001**
	mating	0.002	1,139	0.97
	sex*mating	0.43	1,139	0.51
	full model	6.47	3,139	**0.0004**

Table S11.

Part 2. Effect of block on implant darkness (nonparametric Wilcoxon/Kruskal-Wallis χ^2 tests) and implant thickness (ANOVAs) by species, treatment, and sex. Values that are statistically significant at a level of *P* < 0.05 are in bold text.

Species, treatment, sex	Implant darkness		Implant thickness	
	X^2	*P*	F	*P*
MS virgin males	17.7	**< 0.0001**	15.2	**0.0004**
MS mating males	0.80	0.37	1.58	0.22
MS virgin females	3.63	0.057	5.49	**0.026**
MS mating females	0.98	0.32	0.02	0.89

MC virgin males	4.56	**0.033**	12.2	**0.0013**
MC mating males	4.62	**0.032**	0.32	0.59
MC virgin females	3.4	0.063	0.85	0.36
MC mating females	0.41	0.52	0.54	0.47

Table S12.

Part 2 effects of mating opportunity treatment by block. Only blocks with statistically significant differences in implant darkness or thickness (Table S10) were analyzed. Nonparametric Wilcoxon/Kruskal-Wallis χ^2 tests were used to determine the effect of mating opportunity treatment on implant darkness in each block. ANOVAs were used to determine the effect of mating opportunity treatment on implant thickness in each block. Values that are statistically significant at a level of $P < 0.05$ are in bold text.

Species, sex, block	Implant darkness		Implant thickness		
	X^2	*P*	F	df	*P*
MS males block 1	1.79	0.18,	3.76	1,33	0.061
MS males block 2	3.85	0.050	3.89	1,42	0.056
MS females block 1	–	–	0.0015	1,29	0.97
MS females block 2	–	–	0.39	1,29	0.54
MC males block 1	0.21	0.65	4.81	1,65	**0.032**
MC males block 2	2.79	0.095	3.04	1,80	0.09

Table S13.

Part 2, effect of enclosure within each block. Within each block, there were two mixed-sex enclosures in the mating opportunity treatment. Here, we test whether there were differences in implant darkness and thickness among enclosures, within each block. Nonparametric Wilcoxon/Kruskal-Wallis χ^2 tests were used to determine the effect of enclosure on implant darkness in each block. ANOVAs were used to determine the effect of enclosure on implant thickness in each block.

Species, sex, block	Implant darkness		Implant thickness		
	χ^2	*P*	F	df	*P*
MS males block 1	0.018	0.89	0.07	1,15	0.80
MS males block 2	0.14	0.71	1.17	1,21	0.29
MS females block 1	0.00	1	0.08	1,12	0.79
MS females block 2	1.33	0.25	0.02	1,16	0.89
MC males block 1	0.025	0.87	2.06	1,13	0.17
MC males block 2	1.24	0.27	0.48	1,14	0.50
MC females block 1	0.0014	0.97	0.11	1,18	0.74
MC females block 2	0.0079	0.93	0.79	1,16	0.39