Supplemental Information to "Sexual signaling strategy shows no influence on the morphometrics of firefly's primary olfactory organs"

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Contents

Figures: none

Tables: SI Table 1 through SI Table 6

Information about reproducibility of figures and statistics

Figures, tables, and statistical values are fully reproducible in the main manuscript as well as the supplemental information using RStudio version 2024.12.1+563 and R version 4.4.1 or higher from a R project in the Github repository: https://github.com/lindsaywaldrop/firefly-morphology. All data, code, and images are available publicly in this repository. Instructions for directly reproducing this project are included in the repository.

Antennal morphometrics are independent of body size

Data in the manuscript are not normalized by body length because no significant relationship with body length was found among the morphometric measurements using one-way ANOVAs. This includes body length with antenna length ($F(1, 19) = 3.92$, $p = 0.06$), flagellar segment width ($F(1, 23) = 0.341$, $p = 0.6$), olfactory sensilla width ($F(1, 23) = 0.406$, $p = 0.5$), and olfactory sensilla length ($F(1, 23) = 0.21$, $p = 0.7$).

Additional values from statistical comparisons

In the main manuscript's Tables 2 and 3, p-values were presented as a result of statistical comparisons. Here are additional values presented in Tables:

- SI Table 1: comparison values for all sensilla by signal, corresponding to comparisons in Table 2 and Fig. 3c,d.
- SI Table 2: comparison values for mechanosensory sensilla by signal, corresponding to comparisons in Table 2, Fig. 3a-d, and Fig. 6a,b.
- SI Table 3: comparison values for olfactory sensilla by signal, corresponding to comparisons in Table 2, Fig. 3a-d, Fig. 4a, and Fig. 6 a,b.
- SI Table 4: comparison values for all sensilla by sex, corresponding to comparisons in Table 3 and Fig. 7c,d.
- SI Table 5: comparison values for mechanosensory sensilla by sex, corresponding to comparisons in Table 3 and Fig. 7a-d.
- SI Table 6: comparison values for olfactory sensilla by sex, corresponding to comparisons in Table 3 and Fig. 7a,b.

SI Table 1: Phylogenetically corrected comparisons of species means against signal type for all sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (visual)	Mean value (chemical)	Sample size	F value	p value
Width	n/a	n/a	n/a	n/a	n/a
Length	n/a	n/a	n/a	n/a	n/a
Density	3480 ± 1000	3270 ± 2000	26	0.000671	0.77
Mean distance	28.7 ± 10	27.6 ± 9	26	0.0849	0.82
Count per segment	337 ± 300	614 ± 600	26	1.2	0.24
Fraction	n/a	n/a	n/a	n/a	n/a

SI Table 2: Phylogenetically corrected comparisons of species means against signal type for mechanosensory sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (visual)	Mean value (chemical)	Sample size	F value	p value
Width	2.18 ± 0.4	2.51 ± 0.7	26	2.330	0.352
Length	64.7 ± 20	71.2 ± 20	26	0.896	0.556
Density	2330 ± 1000	2140 ± 1000	26	0.217	0.770
Mean distance	34.2 ± 10	36.2 ± 20	26	0.153	0.820
Count per segment	205 ± 90	358 ± 300	26	3.550	0.240
Fraction	0.683 ± 0.1	0.638 ± 0.2	26	0.346	0.700

SI Table 3: Phylogenetically corrected comparisons of species means against signal type for olfactory sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (visual)	Mean value (chemical)	Sample size	F value	p value
Width	1.87 ± 0.6	3.07 ± 2	26	5.610	0.121
Length	13.3 ± 3	13.2 ± 3	26	0.003	0.967
Density	1170 ± 700	1160 ± 700	26	0.001	0.990
Mean distance	46.5 ± 20	44.2 ± 10	26	0.085	0.870
Count per segment	129 ± 200	248 ± 400	26	1.200	0.500
Fraction	0.328 ± 0.1	0.368 ± 0.2	26	0.227	0.780

SI Table 4: Phylogenetically corrected comparisons of species means against sex type for all sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (female)	Mean value (male)	Sample size	F value	p value
Width	n/a	n/a	n/a	n/a	n/a
Length	n/a	n/a	n/a	n/a	n/a
Density	3020 ± 1000	3450 ± 1000	23	2.77	0.86

	Mean value (female)	Mean value (male)	Sample size	F value	p value
Mean distance	33.1 ± 20	27.6 ± 9	23	1.3	0.93
Count per segment	342 ± 200	479 ± 500	23	0.485	0.78
Fraction	n/a	n/a	n/a	n/a	n/a

SI Table 5: Phylogenetically corrected comparisons of species means against sex type for mechanosensory sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (female)	Mean value (male)	Sample size	F value	p value
Width	2.18 ± 0.3	2.28 ± 0.6	23	0.300	0.703
Length	63.4 ± 7	68.1 ± 20	23	0.356	0.706
Density	2260 ± 1000	2150 ± 1000	23	0.053	0.860
Mean distance	36.7 ± 10	35.9 ± 10	23	0.019	0.930
Count per segment	225 ± 100	262 ± 200	23	0.136	0.780
Fraction	0.732 ± 0.1	0.627 ± 0.1	23	2.620	0.210

SI Table 6: Phylogenetically corrected comparisons of species means against sex type for mechanosensory sensilla. Statistical scores (n, sample size; F-values; p-values) included for each comparsion of sensillum width, sensillum length, sensilla density, mean distances between sensilla, mean count of sensilla per segment, and mean fraction of sensilla.

	Mean value (female)	Mean value (male)	Sample size	F value	p value
Width	2.86 ± 2	2.34 ± 1	23	1.060	0.470
Length	13.6 ± 1	12.6 ± 3	23	0.560	0.587
Density	799 ± 400	1340 ± 800	23	2.770	0.230
Mean distance	54.1 ± 20	43.3 ± 20	23	1.300	0.400
Count per segment	115 ± 200	211 ± 300	23	0.485	0.620
Fraction	0.291 ± 0.1	0.382 ± 0.1	23	2.110	0.300