## **Appendix 1**

## **Alternative analysis of allometric relationships**

When analysing allometric relationships, we chose to use tibia-patella length as our indicator of spider body size. However, the square root of carapace area may be a better linear indicator of body size for sexually dimorphic species such as *Argiope lobata*. Accordingly, we here perform the same allometric relationship tests as in the main article, using square root of carapace area rather than tibia-patella length as our indicator body size. We estimated carapace area as carapace width × height.

Of the four traits we compared, only a single RMA slope differed significantly from 1: female median septum width, with a slope >1 (Table S1, Figure S1). Of the four traits, only pedipalp apophysis area and showed a significant correlation. We required both a significant positive correlation and an RMA slope <> 1 to establish a non-isometric relationship, and none of the relationship we tested satisfied both criteria. These results are qualitatively the same as our results when using tibia-patella length as the indicator of body size. Accordingly, our conclusions are not affected by our choice of body size indicator.

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Figure S1.Static allometry of genital structures and body size proxy () in female (left panels) and male (right panels) A. lobata. Red line shows the fitted RMA regression; dashed indicates there is not a significant correlation between the two variables. Filled polygon depicts 99% confidence intervals (CI) of the RMA slope. The black dotted line indicates isometry (slope = 1 and passing through the centroid of the points). Points represent individual spiders. Evidence for allometry requires 1) a significant correlation between the two variables and 2) the RMA CI does not include the line of isometry. None of the relationships satisfy both conditions.

Table S1. Static allometry: 99% confidence interval (lower limit, LL, and upper limit, UL) of slope of reduced major axis (RMA) regression analysis and correlation (P-value and R2) of male and female genital characteristics on body size proxy (, SCA) in A. lobata. LL and UL values in bold indicate slope ≠ 1. P-value and R2 in bold indicate a significant positive correlation between SCA and genital trait at the p<0.01 level

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| --- | --- | --- | --- | --- | --- |
| Body size vs genital characteristics | LL | UL | P | R2 | n |
| *Median septum length vs female SCA* | 0.99 | 2.02 | 0.013 | 0.12 | 50 |
| *Median septum width vs female SCA* | **1.19** | **2.51** | 0.023 | 0.03 | 50 |
| *Pedipalp apophysis area vs male SCA* | 0.89 | 1.73 | **<0.001** | **0.29** | 47 |
| *Spur length vs male SCA* | 0.89 | 1.93 | 0.066 | 0.07 | 47 |