**Supplementary Table 1**

Angular separation in ° for each combination of appendages at four time points (start of power stroke (PS), mid power stroke (MPS), start of recovery stroke (RS), and mid recovery stroke (MRS) for both treatment groups, controls and amputees. These values were computed by subtracting the limb beat angle of the second limb listed from the first.

|  |  |  |  |
| --- | --- | --- | --- |
| Appendage Pair | Time Point | Control ($\overbar{x}$ *c* ± SD) | Amputated ($\overbar{x}$ *a* ± SD) |
| Left antennule and antenna | MPS | 40.2±16.8 | 68.2±29.1 |
| RS | 82.2±3.65 | 104±17.5 |
| MRS | 38.6±13.5 | 60.7±23.4 |
| Right antennule and antenna | MPS | 39.7±14.9 | 64.1±28.6 |
| RS | 82.3±15.7 | 110±28.0 |
| MRS | 35.4±13.8 | 65.9±25.0 |
| Left antennule and mandible | PS | 18.4±8.16 | 119±23.0 |
| MPS | 16.8±9.01 | 117±25.1 |
| RS | 18.7±5.15 | 100±23.1 |
| MRS | 15.1±10.0 | 119±20.9 |
| Right antennule and mandible | PS | 13.4±6.59 | 122±25.6 |
| MPS | 8.91±10.4 | 123±25.6 |
| RS | 14.0±9.11 | 106±25.1 |
| MRS | 9.03±9.48 | 128±15.8 |
| Left antenna and mandible | PS | 6.47±11.9 | 101±10.0 |
| MPS | -23.3±16.4 | 49.2±24.5 |
| RS | -63.5±5.85 | -3.41±29.4 |
| MRS | -23.5±12.8 | 58.9±24.5 |
| Right antenna and mandible | PS | 3.60±6.71 | 108±12.2 |
| MPS | -30.8±13.1 | 59.2±22.7 |
| RS | -68.3±10.5 | -3.98±23.1 |
| MRS | -26.4±14.1 | 62.1±15.3 |

**Supplementary Figure 1**Flexion angle on the left antennule for control (A, E, I, M) and amputated *Ocotolasmis warwicki* nauplii (B, F, J, N) through a stroke cycle. Boxplots shows the population mean (n = 9 for control and 10 for amputee) for flexion angle (C, G, K, O)and inflection ratio (D, H, L, P)at the corresponding time point of the stroke cycle. The four rows from the top to bottom correspond to the start of power stroke (A-D), mid power stroke(E-H), start of recovery stroke (I-L) and mid recovery stroke (M-P). Each box represents the 1st and 3rd quartiles with maximum and minimum values represented by extended lines perpendicular to the box. Mean value is represented by the line within each box. \* denotes *p* <0.05, \*\*\* denotes *p* <0.0001.

