



Fig. S1. Body velocity decreases from walking to climbing. Average velocities per trial of *Carausius* (top), *Aretaon* (middle) and *Medauroidea* (bottom) for the different conditions (Flat; Low; Middle; High) and for the pooled data (All). The box plots show the medians (red), inter-quartile range (blue) and entire ranges. Red dots are outliers. Black dotted line indicates median velocity of all *Carausius* trials. *Carausius* walked faster than the other two species. *Medauroidea* was slowest (despite being the largest) and showed hardly any change in walking velocity across conditions. The number of animals and trials differs between species: *Carausius* $N=9$ ($n=323$); *Aretaon* $N=8$ ($n=186$); *Medauroidea* $N=6$ ($n=167$).

Table S1: Statistics for the mean swing directions

Genus	length	HL					ML					FL				
		dir	r	SD	p	z	dir	r	SD	p	z	dir	r	SD	p	z
<i>Carausius</i>	long	-2	0.97	0.23	<0.001	4879	1	0.97	0.26	<0.001	4813	-2	0.91	0.45	<0.001	4048
	short	42	0.19	1.83	<0.001	23	25	0.13	2.01	<0.001	18	-60	0.11	2.10	<0.001	21
<i>Aretaon</i>	long	1	0.97	0.24	<0.001	3116	-2	0.97	0.24	<0.001	3140	2	0.93	0.39	<0.001	2833
	short	19	0.40	1.36	<0.001	44	31	0.44	1.27	<0.001	89	-14	0.29	1.56	<0.001	65
<i>Medauroidea</i>	long	0	0.98	0.20	<0.001	1147	0	0.97	0.24	<0.001	1218	3	0.90	0.47	<0.001	856
	short	32	0.18	1.85	<0.001	31	70	0.12	2.04	<0.001	26	-23	0.11	2.11	<0.001	15

Mean swing direction vectors differ between long and short steps. The direction (dir [°]), the length (r), the standard deviation (SD), the p-value and the z-value of the circular statistics are given for short and long steps of each leg type and of each species.