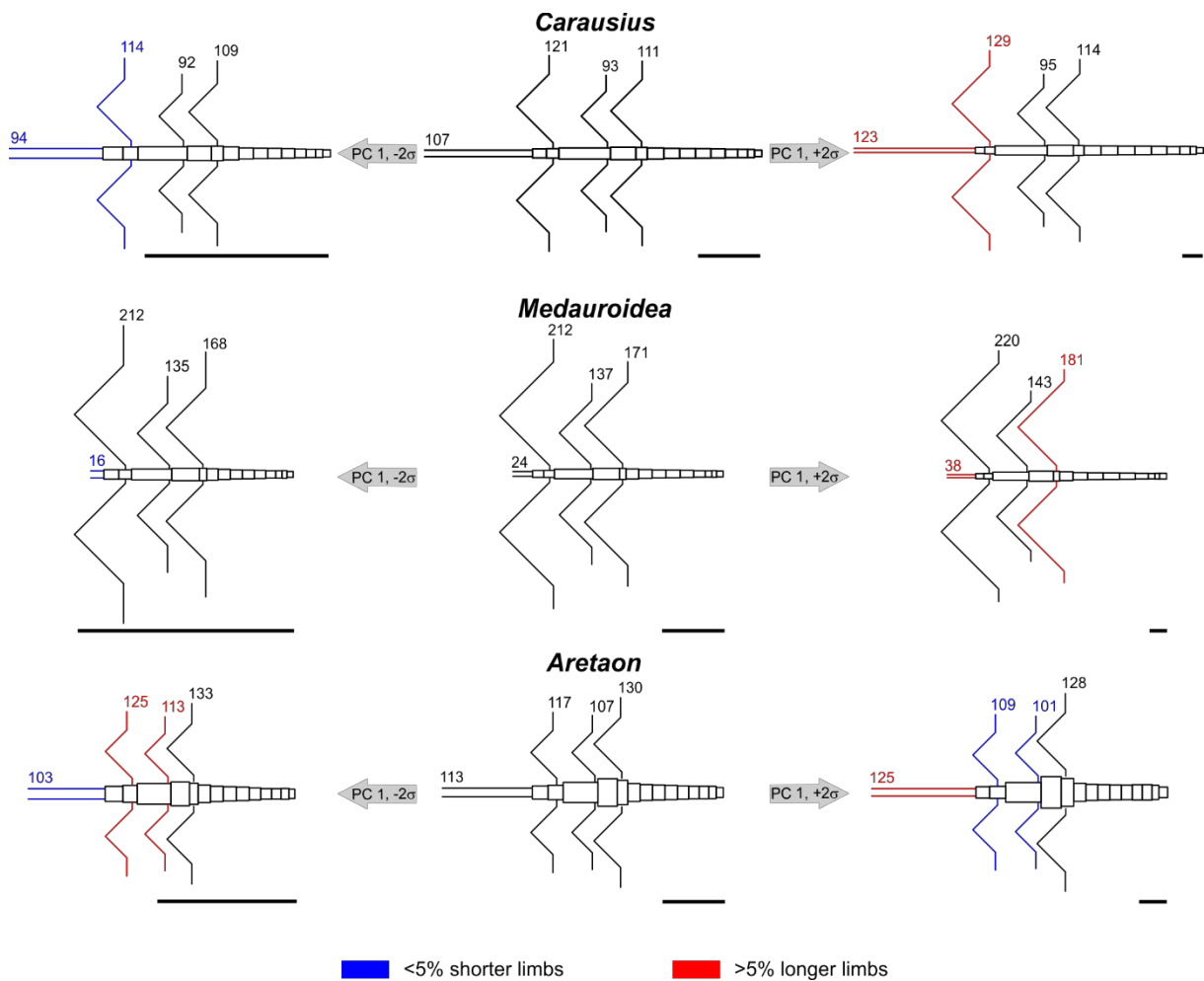


Supplementary Material



Supplementary Figure S1: Principal component coding for growth. Standardised mean body shapes (centres of each panel, below genus name) and their modulation according to PC 1 of morphospace analysis (see also Fig. 8 and Fig. 9). Grey arrows indicate the sign of modulation along the axis of PC 1. Magnitude of modulation was set to $\pm 2\sigma$ of the corresponding PC scores to illustrate the range of variation within the data set. Scale bars are 10 mm, underscoring the strong effect of PC 1 on overall size. Additionally to its coding for growth, PC 1 also codes for some differences in overall body shape, including aspects of sexual dimorphism, though inconsistently. Colours of limbs indicate at least 5% larger (red) or 5% smaller (blue) limb-to-thorax length ratio compared to the mean (black). Numbers next to the limbs indicate the limb-length-to-thorax ratio in percent (for example, the mean front leg of *Carausius* is 121% longer than its thorax).

Supplementary Table S2: Principal Components of the Morphospace Analysis.

Top rows indicate the variance and cumulative variance explained by the first three PC of the morphospace analysis. Below that, columns list the 45 coefficients of each PC. Note that all coefficients of PC 1 are positive in all species, mirroring its effect on overall growth. PC 2 and PC 3 have both positive and negative coefficients, thus differentially increasing/decreasing the linear size of features of the antennae (Ant.) front legs (FL.), middle legs (ML.), hind legs (HL.), head (Hd.), thorax (T1. to T3.) or abdominal segments (A1 to A10.). Features include the position (.pos) of a limb base, the lengths of leg coxa (.cox), femur (.fem), tibia (.tib), tarsus (.tar), or the length (.L) or width (.W) of the head, thorax or abdominal segments.

	<i>Carausius</i>			<i>Medauroidea</i>			<i>Aretaon</i>		
	PC1	PC2	PC3	PC1	PC2	PC3*	PC1	PC2*	PC3
variance	95.52	2.5	0.6	96.34	1.1	0.76	95.52	1.28	1.15
cumul. var.	95.520	98.020	98.620	96.340	97.440	98.200	95.520	96.800	97.950
Ant.pos	0.098	-0.093	-0.117	0.104	-0.064	-0.172	0.115	-0.005	-0.006
Ant.L	0.176	0.292	-0.066	0.203	0.459	-0.376	0.171	0.094	-0.263
FL.pos	0.137	-0.070	0.019	0.123	-0.060	-0.095	0.184	0.170	0.299
FL.cox	0.150	-0.054	-0.046	0.168	-0.010	0.128	0.136	0.018	-0.085
FL.fem	0.165	0.201	-0.042	0.152	0.151	-0.005	0.137	0.036	-0.126
FL.tib	0.180	0.280	-0.116	0.166	0.170	-0.045	0.149	0.025	-0.218
FL.tar	0.137	0.153	-0.041	0.087	0.152	-0.067	0.141	0.052	-0.111
ML.pos	0.126	-0.119	0.244	0.137	-0.059	0.289	0.141	-0.004	-0.086
ML.cox	0.144	0.017	-0.116	0.191	0.037	0.007	0.143	0.005	-0.147
ML.fem	0.165	0.182	-0.059	0.153	0.150	-0.034	0.143	0.058	-0.147
ML.tib	0.167	0.217	-0.121	0.164	0.192	-0.094	0.145	0.009	-0.212
ML.tar	0.132	0.119	-0.036	0.100	0.136	-0.071	0.143	0.036	-0.125
HL.pos	0.148	-0.002	0.094	0.141	0.006	0.058	0.150	0.064	-0.061
HL.cox	0.149	-0.003	-0.014	0.183	0.052	-0.017	0.145	0.020	-0.137
HL.fem	0.167	0.213	-0.071	0.159	0.168	-0.061	0.150	0.054	-0.165
HL.tib	0.170	0.254	-0.102	0.166	0.179	-0.111	0.156	0.020	-0.231
HL.tar	0.126	0.127	-0.008	0.088	0.144	-0.091	0.140	0.043	-0.127
Hd.L	0.103	-0.094	-0.042	0.120	0.008	-0.134	0.120	-0.012	-0.058
Hd.W	0.105	-0.102	-0.078	0.117	-0.073	-0.152	0.118	-0.045	-0.046
T1.L	0.130	-0.047	-0.006	0.132	-0.038	-0.045	0.153	0.081	0.112
T1.W	0.112	-0.135	-0.068	0.121	-0.100	-0.120	0.114	-0.090	-0.023
T2.L	0.162	0.090	0.016	0.150	0.109	0.004	0.149	0.116	-0.109
T2.W	0.131	-0.152	-0.088	0.137	-0.166	-0.027	0.139	-0.060	0.114
T3.L	0.164	0.082	0.064	0.150	0.156	0.037	0.151	0.062	-0.055
T3.W	0.135	-0.176	-0.061	0.144	-0.205	0.006	0.169	-0.018	0.126
A1.L	0.149	-0.004	0.119	0.146	-0.006	0.093	0.176	0.151	0.038
A1.W	0.129	-0.194	-0.072	0.142	-0.208	-0.036	0.169	-0.070	0.109
A2.L	0.164	-0.001	0.278	0.166	0.071	0.308	0.144	0.082	0.052
A2.W	0.133	-0.198	-0.105	0.140	-0.214	-0.108	0.145	-0.287	0.135
A3.L	0.169	-0.030	0.268	0.168	0.059	0.261	0.138	0.122	0.072
A3.W	0.143	-0.209	-0.147	0.135	-0.222	-0.140	0.148	-0.380	0.084
A4.L	0.170	-0.062	0.283	0.173	0.025	0.235	0.136	0.136	0.121

Dürr and Mesanovic, 2022: Behavioural function and development of body-to-limb proportions and active movement ranges in three stick insect species. Supplementary Material.

A4.W	0.145	-0.224	-0.177	0.140	-0.233	-0.128	0.150	-0.384	0.082
A5.L	0.170	-0.072	0.293	0.177	0.002	0.282	0.134	0.147	0.185
A5.W	0.146	-0.222	-0.213	0.141	-0.234	-0.107	0.152	-0.383	0.092
A6.L	0.170	-0.083	0.290	0.176	-0.028	0.275	0.137	0.173	0.213
A6.W	0.148	-0.197	-0.207	0.141	-0.226	-0.129	0.161	-0.335	0.057
A7.L	0.167	-0.114	0.278	0.173	-0.043	0.276	0.138	0.142	0.233
A7.W	0.150	-0.114	-0.200	0.139	-0.218	-0.172	0.178	-0.240	-0.077
A8.L	0.164	-0.056	0.133	0.158	0.015	0.080	0.148	0.157	0.180
A8.W	0.157	0.041	-0.219	0.136	-0.139	-0.162	0.179	-0.030	-0.167
A9.L	0.145	0.292	0.101	0.152	0.018	0.079	0.128	0.173	0.264
A9.W	0.155	0.033	-0.191	0.137	-0.107	-0.072	0.169	0.095	-0.121
A10.L	0.151	-0.051	0.127	0.165	0.039	-0.045	0.181	-0.027	0.318
A10.W	0.142	-0.132	-0.028	0.155	-0.164	0.009	0.154	0.096	-0.028