



Movie 1. Pivot turn movie. Footage of *P. macropalpis* executing a pivot turn, initially in real-time and then slowed 1/30.

Table S1. Relative speed and mass data for fast-running animals included in Fig. 7

Species	v_r (BL s ⁻¹)	M_b (g)	References
Arthropoda			
Arachnida			
Araneae			
<i>Argiope aurantia</i>	15.0	0.86	Foellmer et al., 2011
<i>Dolomedes plantarius</i>	37.5	1	Gorb and Barth, 1994 ^M
<i>Hololena adnexa</i>	24	0.1	Spagna et al., 2011 ^M
<i>Hololena adnexa</i>	79	0.1	
<i>Eratigena atrica</i>	28.6	0.5	Guinness Book
<i>Schizocosa ocreata</i>	75	0.05	Amaya et al., 2001 ^L
Solifugae			
<i>Eremobates marathoni</i>	9.9	9.9	Punzo, 1998
Acari			
<i>Paratarsotomus macropalpis</i>	154	0.00025	Current study
	214.6	0.000025	
Insecta			
<i>Formica polyctena</i>	26	0.021	Hurlbert et al., 2008
<i>Cataglyphis bombycina</i>	74	0.01	Wehner, 1983; Wittlinger et al., 2007
<i>Periplaneta americana</i>	50	0.83	Full and Tu, 1991
<i>Onymacris plana</i>	50	1.3	Nicolson, Bartholemew and Seeley, 1984
<i>Cicindela eburneola</i>	171	0.05	Kamoun and Hogenhout, 1996
Myriapoda - Chilopoda			
<i>Scutigera coleoptrata</i>	19.1	0.1	Manton, 1965
Crustacea			
<i>Ocypode centrophthalma</i>	100	12	Burrows and Hoyle, 1973
Reptilia			
<i>Callosaurus draconoides</i>	55.3	9.5	Irschick and Jayne, 1999
<i>Cnemidophorus tigris</i>	37.6	17.3	
<i>Varanus gouldi</i>	18.6	429	Clemente et al., 2009
<i>Varanus giganteus</i>	12.9	2970	
Mammalia			
<i>Gazella thompsoni</i>	24.2	20,500	
<i>Procapra gutturosa</i>	17.8	30,000	See Iriate-Díaz, 2002
<i>Canis latrans</i>	20.1	13,300	
<i>Vulpes fulva</i>	28.7	4800	
<i>Acinonyx jubatus</i>	15	20,000	
<i>Sciurus carolinensis</i>	31.0	500	
	30.2	76	
<i>Ammospermophilus leucurus</i>			

Species	v_r	M_b	References
<i>Neotoma lepida</i>	24.3	1100	
<i>Mus musculus</i>	43.9	16	
<i>Perognathus longimenbris</i>	39.3	8.9	
<i>Lepus europeus</i>	37.1	4000	
(larger mammals, >35 kg)			
<i>Homo sapiens</i>	5	85,000	
<i>Equus zebra</i>	7.4	300,000	
<i>Equus burchelli</i>	8.2	235,000	
<i>Bison bison</i>	5.4	865,000	
<i>Cervus elephas</i>	9.0	300,000	
<i>Rangifera tarandus</i>	12.7	100,000	
<i>Gazella granti</i>	16.7	62,500	
<i>Antilocapra americana</i>	21.6	50,000	
<i>Antilope cervicapra</i>	23.6	37,500	
<i>Canis lupus</i>	14.1	35,200	
<i>Panthera tigris</i>	7.2	161,000	
<i>Panthera leo</i>	8.2	156,000	
<i>Crocota crocuta</i>	13.5	52,000	

^M, Mass estimated from other literature.

^L, Length estimated from other literature.