

Table S1. Summary statistics, data source, and average joint excursions observed within species.

Group	Species	Body mass	Treadmill	Gait type	Data source	Individuals*	Cycles*	Jaw	Shoulder	Elbow	Wrist	Hip	Knee	Ankle
Urodela	<i>Ambystoma tigrinum</i>	0.13	-	-	(Reilly and Lauder, 1990)	4	42	20.51 ± 1.98	-	-	-	-	-	-
	<i>Dicampodonte tenebrosus</i>	0.07	Yes	Walk, Running trot	(Ashley-Ross, 1994)	5	30	-	-	-	-	60.30 ± 17.55	-	-
	<i>Taricha torosa</i>	0.01	Yes	Walk	(Ashley-Ross et al., 2009)	5	25	-	43.46	84.63	32.76	59.72	63.05	43.09
Anura	<i>Phyllomedusa azurea</i>	0.00	No	Walk	(Herrel et al., 2013)	R	R	-	90.50	97.18	76.54	-	-	-
Squamata	<i>Agama agama</i>	0.31	-	-	(Kraklauer, 1991)	4	16	30.00 ± 12.40	-	-	-	-	-	-
	<i>Agama stellio</i>	0.30	-	-	(Herrel et al., 1996)	2	146	32.00 ± 7.00	-	-	-	-	-	-
	<i>Amphibolurus barbatus</i>	0.69	-	-	(Throckmorton and Clarke, 1981)	3	29	23.29 ± 3.69	-	-	-	-	-	-
	<i>Anolis carolinensis</i>	0.00	No	Running trot	(Foster and Higham, 2012)	S, W, H: 4; E, K, A: R	S, W, H: 5; E, K, A: R	-	88.96 ± 7.11	77.02	56.01 ± 8.81	31.23 ± 3.67	48.07	61.92

<i>Callisaurus draconoides</i>	0.01	Yes	Running trot	(Irschick and Jayne, 1999)	R	R	-	110.09	48.82	87.03	97.30	46.44	30.30
<i>Cnemidophorus tigris</i>	0.02	Yes	Running trot	(Irschick and Jayne, 1999)	R	R	-	111.25	62.40	57.32	152.75	76.89	92.01
<i>Cordylus warreni</i>	0.04	No	Running trot	this study	4	9	-	97.54 ± 17.33	34.03 ± 6.01	61.74 ± 22.40	109.60 ± 2.27	13.84 ± 8.08	72.38 ± 10.08
<i>Dipsosaurus dorsalis</i>	0.07	Yes	Running trot	(Irschick and Jayne, 1999; Schwenk and Throckmorton, 1989)	S, E, W, H, K, A; R; J: 2	S, W, H: 4; E, K, A; R; J: 10	25.00 ± 4.00	76.76	69.26	41.34	114.37	35.77	37.84
<i>Eublepharis macularius</i>	0.05	No	Running trot	(Fuller et al., 2011)	R	R	-	-	-	-	-	73.98	-
<i>Iguana iguana</i>	3.18	-	-	(Schwenk and Throckmorton, 1989)	1	4	42.00 ± 10.00	-	-	-	-	-	-
<i>Laudakia stellio</i>	0.05	No	Running trot	this study	2	15	-	133.62 ± 15.45	62.95 ± 10.30	62.38 ± 14.58	145.96 ± 11.59	98.23 ± 9.03	70.93 ± 13.43
<i>Leiocephalus schreibersii</i>	0.04	No	Running trot	this study	2	20	-	115.05 ± 26.72	5.94 ± 1.93	34.91 ± 12.80	129.77 ± 14.3	33.89 ± 14.30	79.35 ± 6.89
<i>Moloch horridus</i>	0.05	-	-	this study	1	9	25.87 ± 2.70	-	-	-	-	-	-

<i>Oplurus cuvieri</i>	0.05	No	Running trot	(Delheusy and Bels, 1992)	S, E, W, H, K, A: 3; J: 4	S, E, W, H, K, A: 25; J: 60	31.56 ± 6.24	103.55 ± 36.90	54.37 ± 11.21	37.08 ± 3.52	116.77 ± 11.34	43.01 ± 14.73	81.81 ± 15.29
<i>Phelsuma madagascariensis</i>	0.06	-	-	(Delheusy and Bels, 1999)	4	28	39.78 ± 5.06	-	-	-	-	-	-
<i>Phrynoscephalus helioscopus</i>	0.06	-	-	(Schwenk and Throckmorton, 1989)	2	8	33.00 ± 8.00	-	-	-	-	-	-
<i>Phrynosoma platyrhinos</i>	0.05	Yes	Running trot	(Irschick and Jayne, 1999; Schwenk and Throckmorton, 1989)	S, E, W, H, K, A: R; J: 1	S, E, W, H, K, A: 1; J: 5	32.00 ± 1.00	102.61	11.94	47.19	140.37	59.77	90.96
<i>Pogona barbata</i>	0.59	-	-	(Schwenk and Throckmorton, 1989)	1	6	28.00 ± 4.00	-	-	-	-	-	-
<i>Pogona henrylawsoni</i>	0.68	-	-	this study	1	10	30.16 ± 3.47	-	-	-	-	-	-
<i>Sauromalus obesus</i>	0.90	-	-	(Schwenk and Throckmorton, 1989)	3	10	38.00 ± 7.00	-	-	-	-	-	-

<i>Sceloporus clarkii</i>	0.03	Yes	Walk	(Reilly and Delancey, 1997)	2	10	-	-	-	-	39.50 ± 12.65	33.00 ± 12.65	120.50 ± 11.07
<i>Teratoscincus scincus</i>	0.01	No	Running trot	(Fuller et al., 2011)	R	R	-	-	-	-	-	60.00	-
<i>Trioceros jacksonii</i>	1.00	-	-	(So et al., 1992)	3	11	37.60 ± 1.57	-	-	-	-	-	-
<i>Tropidurus torquatus</i>	0.03	No	Running trot	this study	3	8	-	95.77 ± 13.21	43.13 ± 8.12	52.67 ± 15.68	141.17 ± 8.92	80.41 ± 3.41	68.37 ± 13.62
<i>Tupinambis meriana</i>	6.80	Yes	Walk	(Sheffield et al., 2011)	H, K, A: 3; J: 1	H, K, A: 49; J: 30	20.86 ± 3.55	-	-	-	80.00	54.16	51.08
<i>Tupinambis teguixin</i>	6.80	-	-	this study	4	42	16.00 ± 1.00	-	-	-	-	-	-
<i>Uma scoparia</i>	0.75	Yes	Running trot	(Irschick and Jayne, 1999)	S, E, W, H, K, A: R; J: 1	S, E, W, H, K, A: R; J: 7	29.11 ± 4.81	74.36	15.52	59.33	107.19	50.77	30.24
<i>Uromastix acanthinurus</i>	1.50	-	-	(Herrel and Vree, 1999)	4	31	26.48 ± 5.47	-	-	-	-	-	-
<i>Uromastix aegyptius</i>	1.50	-	-	(Schwenk and Throckmorton, 1989)	4	8	23.00 ± 2.00	-	-	-	-	-	-
<i>Varanus</i>	5.00	No	Running trot	(Elias et al., 2000)	S, E, W, H,	S, E, W, H, K, A:	15.00 ± 2.00	105.96 ± 21.95	43.12 ± 16.29	55.73 ± 14.99	115.73 ± 15.99	69.00 ± 12.84	71.40 ± 17.17

Testudines	<i>exanthe maticus</i>					K, A: 2; J: 4	13; J: 29							
	<i>Terrepe ne carolina</i>	0.36	-	-	(Bels et al., 1997)	3	61	46.29 ± 1.37	-	-	-	-	-	-
	<i>Trache mys scripta</i>	0.24	Yes	Walk	(Rivera and Blob, 2010)	7	123	-	85.00 ± 2.30	52.00 ± 1.10	-	-	-	-
Crocodilia	<i>Alligato r mississi piensis</i>	181.44	Yes	Walk	(Baier and Gatesy, 2013; Reilly and Elias, 1998)	3	S, E: 20; H, A: 60	-	52.00 ± 12.00	73.00 ± 23.00	-	77.00 ± 15.49	-	63.75 ± 13.56
	<i>Caiman crocodi lus</i>	30.00	-	-	(Cleure n and de Vree, 1992)	3	29	35.12 ± 8.46	-	-	-	-	-	-
Aves	<i>Anas platyrh ynchos</i>	1.36	-	-	(Dawso n et al., 2011)	3	242	11.91 ± 1.88	-	-	-	-	-	-
	<i>Coturni x japonic a</i>	0.09	Yes	Walk, Bipedal run	(Reilly, 2000)	5	60	-	-	-	-	1.67 ± 15.49	61.33 ± 18.07	61.33 ± 18.07
	<i>Numida meleag ris</i>	1.32	Yes	Walk	(Kambi c et al., 2015)	1	15	-	-	-	-	24.27 ± 5.38	90.69 ± 6.69	74.38 ± 6.84
	<i>Pica pica</i>	0.23	No	Walk, Bipedal run	(Versta ppen et al., 2000)	3	K: 20; A: 28	-	-	-	-	-	13.00 ± 14.50	33.00 ± 10.00

Mammalia	<i>Struthio camelus</i>	100.00	No	Bipedal run	(Smith et al., 2010)	R	3	-	-	-	-	12.09 ± 4.44	32.39 ± 6.45	78.95 ± 8.04
	<i>Vanellus vanellus</i>	0.25	Yes	Walk, Bipedal run	(Nyakatura et al., 2012)	4	6	-	-	-	-	32.40 ± 8.24	62.59 ± 10.84	75.06 ± 12.52
	<i>Acinonyx jubatus</i>	53.50	No	Walk	this study	2	12	-	57.93 ± 18.61	8.28 ± 5.21	28.51 ± 9.32	54.25 ± 7.81	8.20 ± 4.78	18.06 ± 12.34
	<i>Aotus nancymae</i>	0.77	No	Walk	this study	3	35	-	82.96 ± 17.96	34.83 ± 11.06	62.66 ± 5.12	78.64 ± 7.38	18.39 ± 2.62	4.01 ± 1.22
	<i>Aplodontia rufa</i>	1.13	-	-	(Druzinsky, 1995)	6	100	23.70 ± 4.17	-	-	-	-	-	-
	<i>Arctictis binturong</i>	11.50	No	Walk	this study	5	21	-	92.26 ± 13.22	52.29 ± 6.22	45.55 ± 12.12	83.38 ± 4.32	42.08 ± 6.32	81.10 ± 11.23
	<i>Camelus dromedarius</i>	408.23	No	Walk	this study	2	14	-	23.14 ± 14.34	14.87 ± 4.32	21.98 ± 12.35	50.32 ± 7.78	5.04 ± 3.68	25.45 ± 17.21
	<i>Capra aegagrus hircus</i>	45.36	-	-	(Musinsky, 2012)	R	9	13.93 ± 1.56	-	-	-	-	-	-
	<i>Caracal caracal</i>	16.00	No	Walk, Running trot	this study	2	24	-	77.71 ± 16.78	27.49 ± 2.48	17.20 ± 9.45	72.59 ± 3.69	54.79 ± 9.21	79.65 ± 17.21
	<i>Cebus capucinus</i>	3.08	No	Walk	this study	3	9	-	71.32 ± 21.35	29.88 ± 5.66	43.15 ± 9.67	50.71 ± 4.71	32.92 ± 6.67	38.31 ± 8.23
<i>Cheirogaleus medius</i>	0.28	No	Walk, Running trot	this study	2	27	-	92.97 ± 19.02	23.33 ± 9.27	79.00 ± 6.76	80.77 ± 8.67	10.25 ± 6.51	24.44 ± 10.63	
<i>Dasyurus byrnei</i>	0.10	No	Walk, Running trot	(Fischer et al., 2002)	2	19	-	29.00 ± 7.00	37.00 ± 8.50	53.00 ± 8.16	46.00 ± 10.33	25.00 ± 6.66	34.00 ± 9.00	

<i>Daubentonia madagascariensis</i>	2.94	No	Walk	this study	3	30	-	83.26 ± 15.70	38.60 ± 8.59	54.44 ± 9.90	74.35 ± 6.25	34.66 ± 8.15	33.22 ± 8.42
<i>Didelphis virginiana</i>	2.31	No	Walk	(Hiemae and Crompton, 1971; Jenkins, 1971) (Bonin et al., 2007; Hodson et al., 2000; Hodson et al., 2001)	S, H: 3; J: R	H, S: R; J: 12	33.67 ± 5.77	53.37	-	-	58.59	-	-
<i>Equus ferus caballus</i>	816.47	No	Walk	(Hodson et al., 2000; Hodson et al., 2001)	S, E, W, H, K, A: R; J: 4	S, E, W, H, K, A: R; J: 24	3.22 ± 0.32	28.39	9.32	17.66	60.28	34.57	46.50
<i>Erythrocebus patas</i>	9.45	No	Walk	this study	1	8	-	77.89 ± 15.43	14.42 ± 5.32	48.80 ± 11.32	74.94 ± 9.12	32.01 ± 4.89	26.05 ± 13.80
<i>Eulemur fulvus</i>	2.21	Yes	Walk	(Schmidt, 2005a)	2	S: 60; E: 35; W: 30; H: 31; K: 28; A: 20	-	84.00 ± 9.00	60.00 ± 7.00	61.00 ± 8.00	92.00 ± 6.00	60.00 ± 6.00	51.00 ± 9.00
<i>Felis catus</i>	3.50	No	Walk	(Thexton et al., 1980); this study	S, E, W, H, K, A: 3; J: 5	S, E, W, H, K, A: 15; J: 31	21.43 ± 7.85	66.29 ± 6.23	46.28 ± 5.44	76.32 ± 12.78	74.20 ± 9.76	47.30 ± 6.32	66.27 ± 14.32
<i>Galea musteloides</i>	0.50	Yes	Walk, Running trot	(Fischer et al., 2002)	2	S: 27; E, W: 26; H: 47; K:	-	23.00 ± 3.67	42.00 ± 3.00	37.00 ± 3.83	75.00 ± 4.83	28.00 ± 6.83	53.00 ± 6.66

						74; A: 72								
<i>Gazella spekei</i>	20.00	No	Walk	this study	5	20	-	23.87 ± 17.90	33.23 ± 5.21	23.58 ± 8.68	60.13 ± 9.23	31.58 ± 5.34	20.99 ± 11.21	
<i>Giraffa reticulata</i>	1192.00	No	Walk	this study	3	16	-	45.47 ± 19.43	25.95 ± 12.23	8.50 ± 13.21	53.40 ± 7.35	2.04 ± 4.42	3.89 ± 2.67	
<i>Hapale murgriseus</i>	0.94	No	Walk	this study	2	17	-	73.38 ± 24.54	39.05 ± 9.72	48.04 ± 5.27	58.84 ± 6.35	25.78 ± 6.61	43.95 ± 1.44	
<i>Hetero hyrax brucei</i>	1.20	No	Walk	(Jenkins, 1971)	3	U	-	63.25	-	-	69.02	-	-	
<i>Homo sapiens</i>	80.70	No	Walk	this study	H, K, A: 6; J: 5	H, K, A: 269; J: 351	6.01 ± 1.68	-	-	-	42.34 ± 4.98	65.45 ± 3.78	51.23 ± 7.73	
<i>Lemur catta</i>	2.21	No	Walk	this study	3	30	-	67.91 ± 6.08	19.94 ± 4.38	49.96 ± 8.73	65.40 ± 8.07	25.19 ± 6.10	28.43 ± 9.87	
<i>Leopardus pardalis</i>	13.61	No	Walk, Running trot	this study	1	12	-	81.79 ± 12.43	40.12 ± 6.32	65.01 ± 16.32	82.00 ± 10.43	56.22 ± 9.54	61.46 ± 15.32	
<i>Leptailurus serval</i>	11.79	No	Walk, Running pace	this study	2	15	-	76.72 ± 19.21	40.79 ± 8.32	30.45 ± 12.32	70.67 ± 11.30	26.77 ± 3.28	9.44 ± 6.23	
<i>Loris tardigradus</i>	2.21	No	Walk	this study	2	31	-	95.32 ± 12.10	59.71 ± 8.98	75.94 ± 13.64	113.67 ± 14.27	60.82 ± 2.72	28.42 ± 10.29	
<i>Loxodonta africana and Elephas maximus</i>	5443.11	No	Walk	(Ren et al., 2008)	15	S, E: 8; W: 14; H, K: 21; A: 18	-	44.00 ± 5.66	36.00 ± 2.83	66.00 ± 3.74	29.00 ± 4.58	42.00 ± 4.58	30.00 ± 4.24	
<i>Macaca mulatta</i>	9.90	No	Walk, Running trot	this study	S, E, W, H, K, A: 2; J: 4	S, E, W, H, K, A:	15.74 ± 4.83	94.71 ± 14.63	37.09 ± 2.98	76.02 ± 5.57	82.11 ± 5.50	40.76 ± 4.50	31.97 ± 12.60	

						16; J: 5,769								
<i>Mandri llus sphinx</i>	22.25	-	-	this study	2	41	21.80 ± 3.62	-	-	-	-	-	-	-
<i>Marmot a monax</i>	3.90	-	-	(Druzin sky, 1995)	4	50	23.80 ± 5.83	-	-	-	-	-	-	-
<i>Martes flavigul a</i>	2.50	No	Walk	(Larson et al., 2001)	U	2	-	-	-	-	67.46	-	-	-
<i>Mesocr icetus auratus</i>	0.10	No	Walk	(Jenkin s, 1971)	3	U	6.97 ± 1.76	54.64	-	-	58.54	-	-	-
<i>Microc ebus murinu s</i>	0.12	No	Walk	(Schmi dt, 2005a)	2	S, H, K: 75; E: 74; W: 63; A: 67	-	49.00 ± 8.00	40.00 ± 8.00	76.00 ± 9.00	75.00 ± 7.00	30.00 ± 7.00	36.00 ± 9.00	-
<i>Mirza coquere li</i>	0.31	No	Walk, Runnin g trot	this study	2	16	-	83.21 ± 21.88	66.69 ± 5.40	75.08 ± 1.21	121.29 ± 14.70	72.40 ± 10.46	38.39 ± 8.84	-
<i>Monod elphis domesti ca</i>	0.11	No	Walk, Runnin g trot	(Fische r et al., 2002)	2	S, E, W, H, K: 16; A: 13	-	47.00 ± 5.33	41.00 ± 5.00	71.00 ± 15.00	86.00 ± 5.50	44.00 ± 5.00	66.00 ± 11.66	-
<i>Mustela putoriu s</i>	0.90	No	Walk	(Davis, 2014; Jenkins, 1971)	S, H: 3; J: 4	S, H: U; J: 64	13.70 ± 3.56	62.24	-	-	82.03	-	-	-
<i>Myotis lucifug us</i>	0.01	-	-	(Kallen and Gans, 1972)	25	6	17.82 ± 4.01	-	-	-	-	-	-	-
<i>Nasua narica</i>	4.00	No	Walk	this study	2	45	-	74.97 ± 15.33	33.75 ± 17.20	16.85 ± 5.56	78.64 ± 14.59	19.68 ± 3.82	15.81 ± 6.35	-
<i>Ochoto na</i>	0.25	Yes	Walk, Runnin g trot	(Fische r et al., 2002)	2	29	-	-	-	-	49.00 ± 5.17	21.00 ± 3.83	30.00 ± 3.66	-

<i>Oryctolagus cuniculus</i>	0.25	-	-	(Morimoto et al., 1985)	4	400	12.08 ± 3.64	-	-	-	-	-	-
<i>Ovis aries</i>	23.80	Yes	Walk	(Safayi et al., 2015)	17	150	-	-	-	-	-	-	36.00 ± 5.30
<i>Pan paniscus</i>	38.20	No	Walk	(D'Août et al., 2002)	9	33	-	-	-	-	53.10 ± 15.00	67.30 ± 11.70	39.20 ± 9.20
<i>Pan troglodytes</i>	53.00	Yes	Walk, Running trot	(Pontzer et al., 2014)	4	4	-	26.26 ± 11.39	12.67 ± 8.75	10.81 ± 3.27	17.77 ± 8.17	31.53 ± 10.95	23.89 ± 7.11
<i>Panthera tigris</i>	103.00	No	Walk	this study	4	32	-	73.91 ± 13.32	23.47 ± 2.12	65.22 ± 9.53	73.93 ± 4.32	9.37 ± 4.23	11.72 ± 7.32
<i>Papio anubis</i>	19.20	No	Walk	this study	2	S, E, W, H, K, A: 8; J: 5,764	14.87 ± 5.17	69.05 ± 20.67	20.98 ± 2.79	56.76 ± 7.34	74.28 ± 5.21	22.78 ± 2.15	32.52 ± 6.89
<i>Phascogale arctos cinereus</i>	9.30	No	Walk	(Larson et al., 2001)	U	9	-	-	-	-	58.40	-	-
<i>Pongo pygmaeus</i>	57.00	No	Walk	(Larson et al., 2001)	U	9	-	-	-	-	69.97	-	-
<i>Potos flavus</i>	3.75	No	Walk, Running trot	(Davis, 2014); this study	2	S, E, W, H, K, A: 72; J: 50	15.70 ± 4.54	86.42 ± 17.36	62.38 ± 2.53	50.79 ± 13.16	72.37 ± 5.17	19.06 ± 6.35	35.14 ± 8.42
<i>Procavia capensis</i>	4.00	Yes	Walk, Running trot	(Fischer et al., 2002; Janis, 1979)	S, E, W, H, K, A: 2; J: U	S, E: 44; W: 39; H, K, A: 21; J: 4	24.01 ± 4.02	30.00 ± 7.00	45.00 ± 9.50	25.00 ± 6.83	70.00 ± 8.33	45.00 ± 5.50	60.00 ± 12.33

<i>Procyon lotor</i>	6.50	Yes	Walk	(Jenkins and Camazine, 1977)	3	7	-	-	-	-	71.60 ± 6.30	-	-
<i>Propithecus coquereli</i>	4.38	No	Walk	this study	3	30	-	58.37 ± 9.66	25.97 ± 11.47	37.66 ± 6.86	62.18 ± 8.31	22.76 ± 6.75	30.20 ± 6.93
<i>Pygathrix cinerea</i>	9.23	No	Walk	this study	2	15	-	78.12 ± 17.49	27.18 ± 8.41	-	56.98 ± 17.26	25.89 ± 8.04	-
<i>Pygathrix nemaeus</i>	9.23	No	Walk	this study	2	7	-	83.50 ± 10.73	30.31 ± 14.34	-	62.81 ± 22.14	26.07 ± 8.24	-
<i>Rattus norvegicus</i>	0.50	Yes	Walk, Running trot	(Fischer et al., 2002; Weijns and Dantuma, 1975)	S, E, W, H, K, A: 3; J: 5	S, E, W: 27; H, K, A: 23; J: 16	16.60	38.00 ± 4.50	44.00 ± 4.83	92.00 ± 12.00	60.00 ± 5.50	24.00 ± 3.50	36.00 ± 4.33
<i>Saguinus oedipus</i>	0.49	No	Walk	(Schmidt, 2005a)	2	S: 27; E: 35; W: 25; H: 21; K: 25; A: 22	-	51.00 ± 8.00	36.00 ± 6.00	43.00 ± 9.00	106.00 ± 8.00	38.00 ± 8.00	36.00 ± 9.00
<i>Saimiri sciureus</i>	0.72	No	Walk	(Schmidt, 2005b)	2	S: 73; E: 65; W: 45; H: 47; K: 72; A: 68	-	39.00 ± 9.00	30.00 ± 6.00	50.00 ± 10.00	76.00 ± 9.00	35.00 ± 7.00	45.00 ± 9.00
<i>Sapajus apella</i>	3.08	-	-	this study	3	6492	18.01 ± 6.40	-	-	-	-	-	-

<i>Sus scrofa</i>	68.04	-	-	(Menegaz et al., 2015)	3	32	13.67 ± 1.93	-	-	-	-	-	-
<i>Tachygl ossus aculeatus</i>	5.00	No	Walk	(Jenkins, 1971)	R	U	-	26.57	-	-	78.30	-	-
<i>Tenrec ecuadatus</i>	0.10	-	-	(Oron and Crompton, 1985)	2	44	17.64 ± 2.27	-	-	-	-	-	-
<i>Trachypithecus crepusculus</i>	10.00	No	Walk	this study	2	11	-	86.27 ± 17.85	33.12 ± 8.04	-	64.32 ± 13.59	34.14 ± 7.97	-
<i>Trachypithecus delacourii</i>	10.00	No	Walk	this study	2	6	-	75.33 ± 12.86	19.89 ± 10.45	-	56.58 ± 3.24	25.92 ± 8.02	-
<i>Trachypithecus hatinheensis</i>	10.00	No	Walk	this study	2	12	-	79.61 ± 7.89	23.34 ± 10.68	-	57.00 ± 10.51	24.89 ± 9.76	-
<i>Trachypithecus poliocephalus</i>	10.00	No	Walk	this study	2	10	-	68.88 ± 7.09	27.45 ± 6.29	-	54.06 ± 9.30	26.19 ± 4.41	-
<i>Tupaia glis</i>	0.17	Yes	Walk, Running trot	(Fischer et al., 2002)	2	S, E, W: 28; H, K: 30; A: 29	-	60.00 ± 8.17	70.00 ± 10.50	86.00 ± 16.50	110.00 ± 5.17	72.00 ± 9.33	88.00 ± 7.83

<i>Vareica variegata</i>	3.49	No	Walk	this study	3	30	-	68.93 ± 16.72	39.07 ± 10.56	51.91 ± 15.07	51.81 ± 5.76	33.26 ± 8.98	36.95 ± 9.09
<i>Vulpes vulpes</i>	5.50	Yes	Walk	(Jenkins and Camazine, 1977)	1	6	-	-	-	-	63.20 ± 2.90	-	-

*Data availability often was based on differing sample sizes for each joint (J= Jaw, S = shoulder, E = Elbow, W = Wrist, H = Hip, K = Knee, A = Ankle, R = data collected from representative cycle, U = unknown).

†Data not available or not applicable

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Table S2. Results of paired t-tests and phylogenetic paired T-tests comparing jaw joint excursion with limb joint excursions. *P*-values are adjusted using the false discovery rate. *d* = mean paired difference, d_{phylo} = mean paired phylogenetic difference. * indicates all *p*-values were less than the reported value. Note: s.d. of 0.01 include values ≤ 0.01 . ** *p* values are significant (all $p < 0.005$) after Bonferroni correction.

Joints	<i>d</i>	<i>t</i>	<i>df</i>	<i>p</i> **	d_{phylo}	Pagel's λ	σ^2	t_{phylo}	df_{phylo}	p_{phylo} **	<i>K</i>
Jaw-Hip	66.5	11.1	17	<0.001	69.1±0.26	0.84±0.01	1.77±0.02	5.70±0.07	15	<0.001*	0.89±0.02
Jaw-Knee	26.5	5.06	14	<0.001	26.5±0.01	0.00±0.01	1.23±0.01	5.24±0.01	12	<0.001*	0.41±0.01
Jaw-Ankle	32.7	7.25	14	<0.001	32.7±0.01	0.00±0.01	0.91±0.01	7.51±0.01	12	<0.001*	0.24±0.01
Jaw-Shoulder	53.1	7.93	15	<0.001	57.4±0.21	0.71±0.01	2.81±0.04	3.90±0.07	13	0.002±0.01	0.56±0.01
Jaw-Elbow	18.9	3.45	12	0.005	18.9±0.01	0.00±0.01	1.15±0.01	3.60±0.01	10	0.004±0.01	0.49±0.02
Jaw-Wrist	32.4	5.27	12	0.002	32.2±0.01	0.07±0.01	1.45±0.01	4.91±0.03	10	<0.001*	0.47±0.01

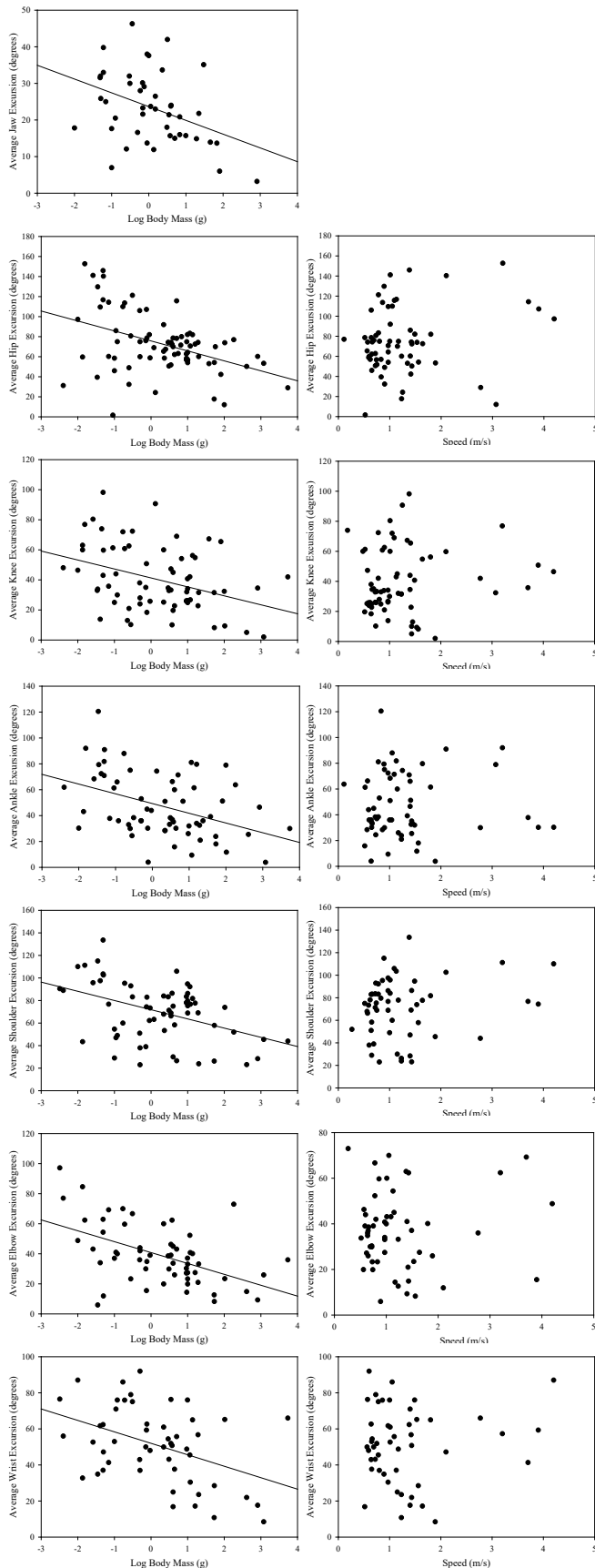


Fig. S1. Scatterplots average joint angular excursion as a function of log-transformed body mass (g) (left panels) and speed (m/s) (right panels). Our sample exhibited a negative correlation between angular excursions and \log_{10} body mass at all joints (all $P \leq 0.02$), but there was no significant association with locomotor speed (all $P > 0.25$).

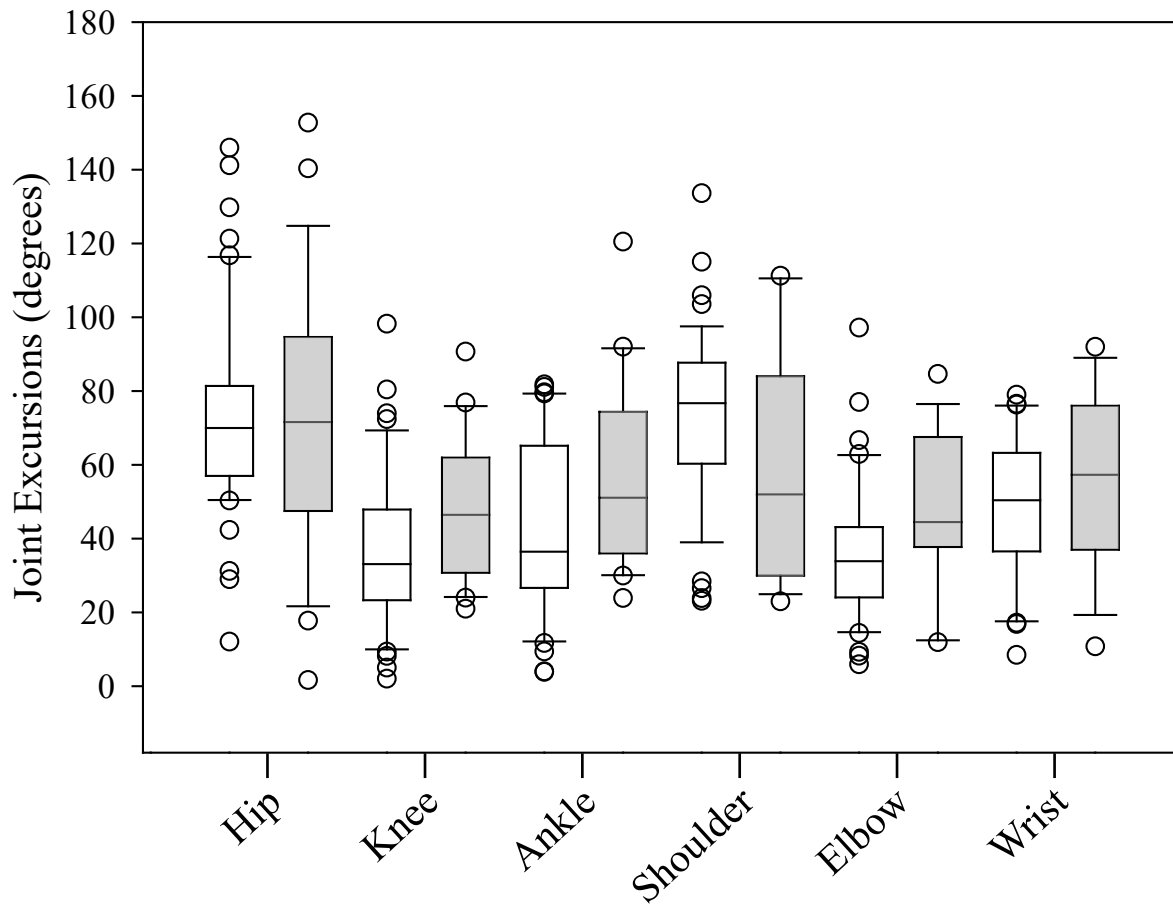


Fig. S2. Box plots of joint angular excursions during freely moving locomotion (white) compared to locomotion on treadmills (gray). Data plotted as median, 10th, 25th, 75th, and 90th percentiles. Open circles represent outliers in the data. Average knee angular excursion is significantly greater for animals moving on treadmills ($P = 0.035$), but no other significant differences (all $P \leq 0.051$) are observed.