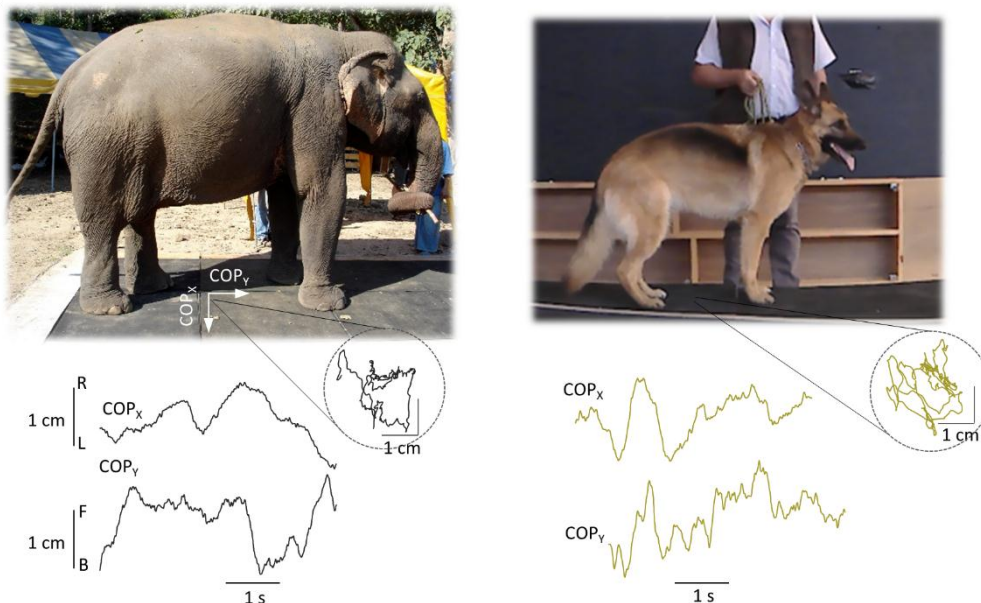


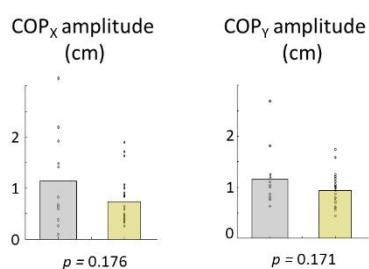
**A** Weight and duration of the trials analysed per each elephant [E] and dog [D] (for dogs, the multiple trials are presented separately as session 1/session 2/etc.)

Elephants				Dogs			
Subject	Mass (kg)	Leg length (cm)	Duration (s)	Subject	Mass (kg)	Leg length (cm)	Duration (s)
E1	3136.5	180.7	4.4	D1	20.8	39	5.7/5.7/8.9
E2	2139.8	142.1	4.4	D2	26.0	58.3	8.9/6.9/6.7
E3	1696.7	142	4.4	D3	29.9	60.0	5.8/6.9/10.1/6.9
E4	3812.9	164.7	4.4	D4	29.9	59.2	6.5/5/7.5/5.2
E5	1291.8	128	4.4	D5	5.8	24.3	5/7.3/5/6.1
E6	1511.5	/	4.4	D6	21.9	48.7	7.5/6/7.9/8
E7	3290.7	176.5	4.4				
E8	2682.9	166.7	4.4				
E9	3008.2	/	4.4				
E10	3136.1	175.6	4.4				
E11	4039.2	/	4.4				
E12	2526.1	169.3	4.4				

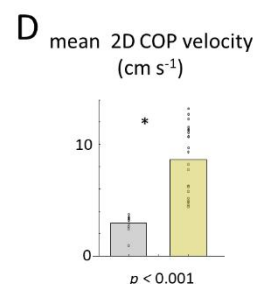
**B**



**C**



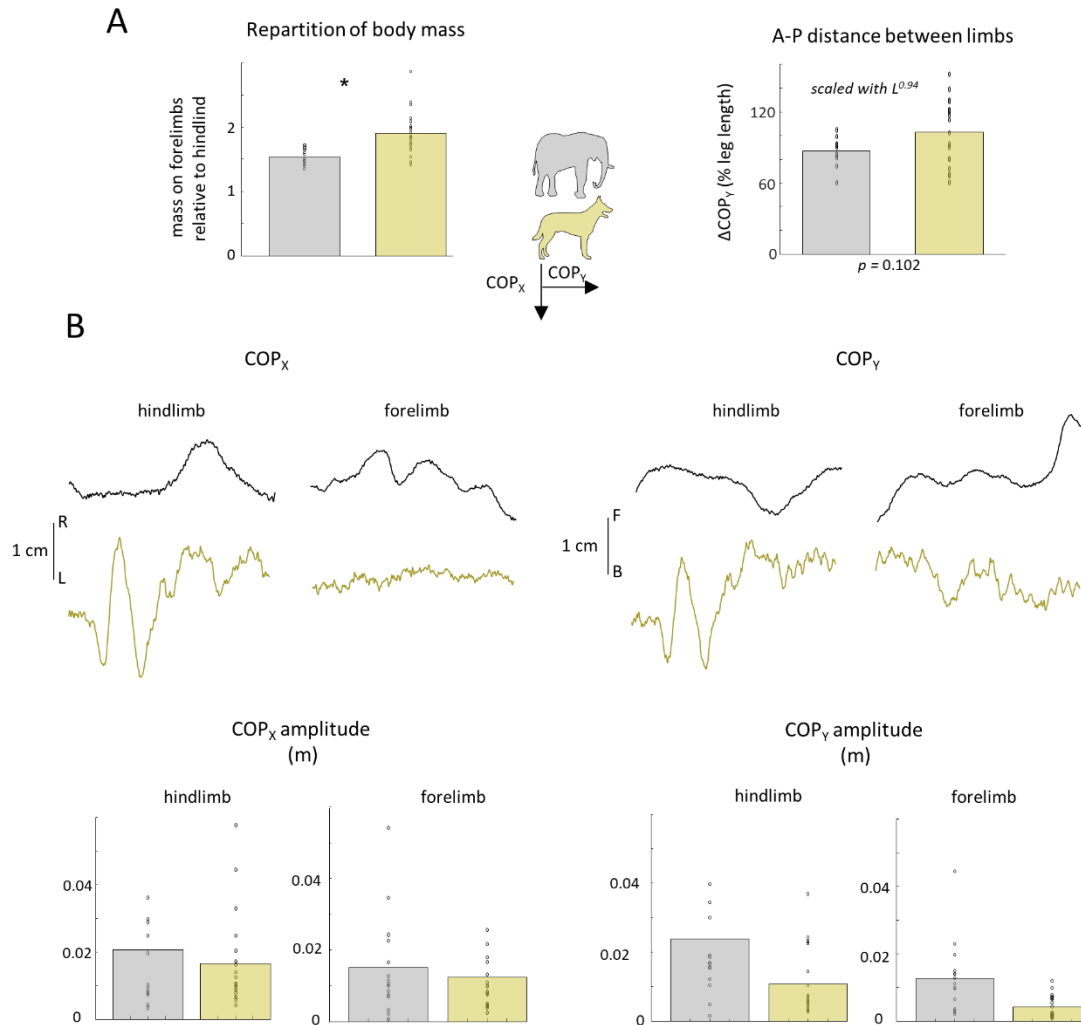
**D**



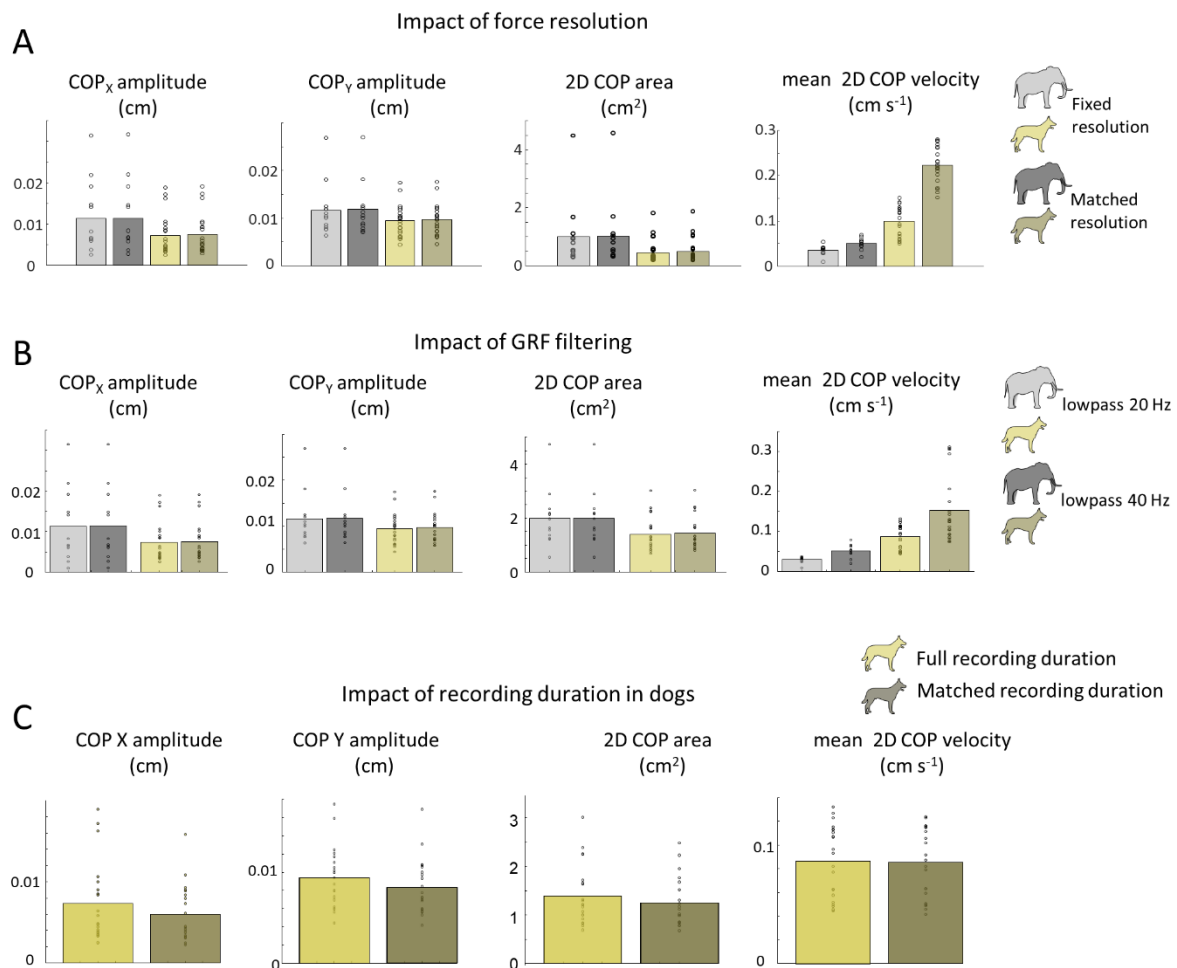
**Fig. S1. Centre of pressure displacement fluctuations during quiet standing in elephants**

**(n=12) and dogs (n=6).** *A* – Weight and duration of the trials analysed per each elephant [E] and dog [D] (for dogs, the multiple trials are presented separately as session 1/session 2/etc.). *B* – Since the standing posture is a quasi-static situation, the COP approximately reflects the movements of the COM in a transverse plane. The figure illustrates two examples of the lateral (COP X) and fore-

art (COP Y) centre of pressure traces versus time. The insets represent the corresponding XY oscillations of the COP displacement around the mean position. R – right, L –left, F – forward, B – backward. *B* – Average COP X and Y amplitudes, 2D COP area and mean 2D COP velocity in dogs (yellow bars) and elephants (grey bars). Each dot corresponds to the individual data. The \* indicates significant difference (Student t-test,  $p < 0.05$ ).



**Fig. S2. Hindlimbs and forelimbs division.** *A* – Body mass repartition expressed as the ratio between mass on the forelimbs relative to that on the hindlimbs and distance between forelimbs and hindlimbs estimated from the distance between  $COP_Y$ , expressed as a function of leg length. No difference is observed between dogs and elephants. *B* – The traces illustrates two examples of the lateral ( $COP_X$ ) and fore-art ( $COP_Y$ ) centre of pressure traces versus time for the hindlimb and forelimb, separately (same animals as in Fig. 1). Note that no correlation was found between  $COP_X/COP_Y$  of forelimb and hindlimb in both elephants and dogs. The bars corresponded to the mean  $COP_X$  and  $COP_Y$  amplitudes under the forelimbs and hindlimbs across all dogs (yellow bars) and elephants (grey bars). Each dot corresponds to the individual data. The \* indicates significant difference (Student t-test,  $p < 0.05$ ).



**Fig. S3. A – Impact of the resolution on COP parameters.** The COP parameters obtained when the ground reaction forces with different absolute resolution for dogs and elephants (see methods) were compared to those obtained the same relative resolution (resolution of 0.1312% of body weight). No modification of amplitude was observed. The COP velocity is different, but the difference between dogs and elephants remained is even greater. **B – Impact of the ground reaction force filtering.** The COP parameters obtained when the ground reaction forces were low-pass filtered (dual pass 2nd order 20 Hz low-pass Butterworth – light colours) were compared to those obtained with a dual pass 2nd order 40 Hz low-pass Butterworth (dark colours). No modification of amplitude was observed. The COP was different, but the differences between dogs and elephants remained unchanged. **C – Impact of the duration of the recordings in dogs.** In dogs, all COP parameters were analysed during the full duration of the recording (light yellow – mean duration =  $6.8 \pm 1.4$  s) or using the same duration than the one used with elephants (dark yellow - 4.4 s). No modification was observed.