



**Fig. S1. Pelvic girdle movements in the pleurodire turtle *Emydura subglobosa* while swimming (A) (N = 2 individuals, 18 cycles), and walking (B) (N = 2 individuals, 35 cycles).** Solid lines represent mean traces for each motion, shading represents standard errors for each motion, and colors indicate different axes of rotation (black - roll; blue - pitch; red - yaw). Traces were normalized to the same duration. Vertical dashed lines represent the transition from stance to swing (walking) or from stroke to recovery (swimming). Very little rotation occurs during either behavior.



**Movie 1.** Animation of cryptodire turtle while walking and swimming, showing typical movements of the femur and pelvis during each behavior. Note the extensive pelvic girdle movements occurring during both behaviors.



**Movie 2.** Animation of pleurodire turtle while walking and swimming, showing typical movements of the femur and pelvis during each behavior. Note the lack of substantial pelvic girdle movements.



**Movie 3.** Animation of a cryptodire turtle while walking, highlighting the substantial ellipsoid movements of the pubis and ischium due to pelvic girdle rotation.