



Supplementary Figure S2. *Allausaurus* (A, B, C) and *Nothronychus* (D, E, F) shoulder

abduction/adduction (A, D), protraction/retraction (B, E), long axis rotation (C, F) plots. Muscles: CB, coracobrachialis; LD, latissimus dorsi. Negative angles and moment arms represent adduction (AA/AD), retraction (PR), and internal rotation (LAI) while positive angles and moment arms represent abduction (A/AD) and (B, E) and protraction (P, F). Crossing 0 reflects a change in direction (Hatchinson et al., 2005).