

**16.2** HOLLIDAY, C.M., RIDGLEY, R.C., SEDLMAYR, J.C., WITMER, L.M.; *Ohio University*. The Articular Cartilage of Extant Archosaur Limb Bones: Implications for Dinosaur Functional Morphology and Al-

lometry.

Extinct archosaurs show variably ossified limb bones implying differing amounts of unpreserved articular cartilage. This “lost anatomy” is underappreciated such that the ends of bones are often considered as joint surfaces, potentially having a major impact on functional interpretation. Alligators and birds were used to establish an objective basis for inferences about cartilaginous articular structures in extinct clades. Girdle and limb elements of alligators and ostriches and other birds were dissected, disarticulated, and defleshed. Element length and condylar shape measurements with intact articular cartilage were taken. One alligator was molded and cast intact and had articular cartilages preserved. Limbs were subsequently skeletonized and the measurements repeated. Removal of cartilaginous condylar regions in alligators resulted in marked loss of cartilaginous structures responsible for joint architecture and posture. Limb element lengths changed between 6% and 15%. Girdle element lengths changed 20-30%. Limb element condylar breadth changed 10-40%. Birds showed less dramatic but variable changes. Morphometric analyses concluded there were few correlations between size and relative or absolute amounts of cartilage in adult alligators. This disparity in the amounts of articular tissue reflects changes in degrees of limb ossification within Archosauria. This missing cartilaginous information has important bearing on the systematics, functional morphology, and allometry of extinct archosaurs and must be considered when using skeletal information when reconstructing the paleobiology of dinosaurs.