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Avian Ancestors

A Review of the Phylogenetic Relationships
of the Theropods Unenlagiidae,
Microraptoria, *Anchiornis*
and Scansoriopterygidae



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Preface

Although consensus exists among authors that birds evolved from coelurosaurian theropods, paleontologists still debate the identification of the group of coelurosaurians that most closely approaches the common ancestor of birds. The past 20 years witnessed the discovery of a wide array of avian-like theropods that has considerably amplified the anatomical disparity among deinonychosaurians, some of which resemble *Archaeopteryx* more than *Deinonychus*. Among these newly discovered theropods that show remarkable bird-like characteristics are the four-winged theropods *Microraptor* and *Anchiornis*, and the unenlagiids *Unenlagia*, *Buitreraptor*, and *Rahonavis*. *Xiaotingia*, *Anchiornis*, and *Archaeopteryx* are regarded as more nearly related to birds, rather than to Dromaeosauridae or Troodontidae. Moreover, a bizarre group of minute-sized coelurosaurs, the Scansoriopterygidae, also exhibits some avian similarities that lead some authors to interpret them as more closely related to birds than other dinosaurs. With the aim to explore the phylogenetic relationships of these coelurosaurians and birds, we merged recently published integrative databases, resulting in significant changes in the topological distribution of taxa within Paraves. We present evidence that Dromaeosauridae, Microraptorina, Unenlagiidae, and *Anchiornis* + *Xiaotingia* form successive sister taxa of Aves, and that the Scansoriopterygidae are basal coelurosaurians not closely related to birds. The implications in the evolutionary sequence of anatomical characters leading to birds, including the origin of flight, are also considered in light of this new phylogenetic hypothesis.

Keywords Microraptorina • Unenlagiidae • *Anchiornis* • Scansoriopterygidae • Origin of birds and flight

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