COMENTARIOS BIBLIOGRÁFICOS

AVIAN ANCESTORS-A REVIEW OF THE PHYLOGENETIC RELATIONSHIPS OF THE THEROPODS UNENLAGIIDAE, MICRORAPTORIA, *ANCHIORNIS* AND SCANSORIOPTERYGIDAE. *Federico L. Agnolín and Fernando E. Novas*. Springer, Dordrecht Heidelberg, Germany, 99 pp, ISBN 978-94-007-5636-6.

The origin of birds represents one of the most controversial issues in evolutionary biology. Much of this controversy is the result of a lack of agreement on avian ancestry and their phylogenetic origins. More specifically, there is no consensus on which theropod group is most closely related to birds because a robust and comprehensive phylogeny for coelurosaurian theropods, a group including tyrannosaurs, deinonychosaurs, birds, and several other subgroups, has yet to be presented.

However, coelurosaurian phylogeny has been the focus of many recent studies. While these studies agree on many aspects of coelurosaurian phylogeny, significant disagreements still exist, including the absence of consensus on the systematic positions of several key taxa which have a major impact on our understanding of the origin of birds and related issues. The book titled "Avian ancestors-A review of the phylogenetic relationships of the theropods Unenlagiidae, Microraptoria, *Anchiornis* and Scansoriopterygidae" represents one of the latest efforts to address this problem and it presents some novel results which are important for the reconstruction of this major evolutionary transition.

The book has five chapters. In chapter one, Agnolín and Novas briefly introduce the current situation in research on coelurosaurian phylogeny. Chapter two presents the methods the authors used for their phylogenetic analysis and their phylogenetic results, which are novel in several aspects. For example, the Deinonychosauria is separated into five clades, i.e., the Troodontidae, the Dromaeosauridae, the Microraptoria, the Unenlagiidae, and the *Anchiornis-Xiaotingia* clade, which are successively more closely related to birds. Another novel result is that the bizarre Scansoriopterygidae being placed at the base of the Oviraptorosauria.

Chapter three is the main part of the book, and in this chapter, the authors discuss salient features supporting their phylogenetic hypothesis. Readers can easily follow the osteological transformations along the line to birds because the authors present their resulting phylogenetic taxonomy and associated supporting evidence in a hierarchical way. Furthermore, many morphological features have been well illustrated, and readers easily can understand the synapomorphies supporting the various clades proposed by the authors.

Chapter four comments on some interesting taxa that are probably closely related to birds, but based on currently available data, their phylogenetic positions are difficult to be accurately ascertained. Nevertheless, these taxa highlight the complex distribution of osteological features across this evolutionary transition to birds. In the last chapter, the authors discuss several issues relating to their phylogenetic framework including the evolution of feathers and wings, the body size evolution, the origin and early evolution of flight, and even the biogeography of the basal birds.

In this book, the authors have built one of the largest datasets for the examination of coelurosaurian phylogeny, but their focus is on several recently discovered taxa, such as Unenlagiidae, Microraptoria, *Anchiornis* and Scansoriopterygidae. All of those taxa play key roles in our understanding of the origin of birds and related issues, but their respective systematic positions are also highly debated. Agnolín and Novas' analysis places these taxa in phylogenetic positions that are consistent with a relatively simple evolutionary scenario for several salient avian features. For example, most other recently proposed coelurosaurian phylogenetic hypotheses would suggest either multiple origins of flight or multiple losses of flight capability near the dinosaur-bird transition. Given Agnolín and Novas' phylogeny, the story is relatively simple: a single origin of avian flight and only one loss of flight capability in the earliest evolution of birds.

Agnolín and Novas' new phylogenetic hypothesis is beautiful in some ways, but this does not necessarily mean that their tree represents the true evolutionary history of this clade. Phylogenetic trees are often tangled, and this situation is especially common in areas of trees near major evolutionary transitions. In fact, the distribution of flight-related features appear to be in conflict with many cranial features related to the cranial kinetics and diet, which makes no phylogenetic tree free of major homoplasies. The newly discovered derived maniraptoran theropods such as *Anchiornis* and *Sapeornis* further highlight this conflict. These authors have made significant advances in understanding newly discovered derived maniraptoran theropods, but given the relatively short research histories of these taxa, it may take a while to thoroughly extract information preserved in the fossils and to fully appreciate their systematic signals, eventually leading us to recover a robust coelurosaurian phylogeny and to secure knowledge of avian ancestry.

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