Gerald Mayr •

Field et al. hypothesize that global deforestation after the K/Pg impact caused the extinction of arboreal Mesozoic birds and structured the early evolution of modern birds. In the abstract, the authors conclude that “ancestral state reconstructions of neornithine ecology reveal a strong bias toward taxa exhibiting predominantly non-arboreal lifestyles across the K-Pg, with multiple convergent transitions toward predominantly arboreal ecologies later in the Paleocene and Eocene.” They then propose “a new hypothesis regarding the extinction of stem birds and the survival of crown birds across the K-Pg boundary: namely, that global deforestation caused by the Chicxulub impact induced a selective filter against the survival of arboreal birds.”

Virtually the same conclusion were, however, already reached in a recent book on avian evolution (Mayr 2017a: 92, 93), which, an imprinted publication date of 2017 notwithstanding, was already released in September 2016. In this publication, it was considered “very possible, if not likely, that arboreal Neornithes indeed did not diversify before the end Cretaceous extinction of the Enantiornithes (…). Predominantly terrestrial or aquatic habitat preferences of Cretaceous Neornithes would (…) be consistent with the fact that these are also assumed for non-neornithine birds close to the origin of the crown group. (…) A selective extinction of avian lineages at the K/Pg boundary could have been triggered by profound vegetation changes, such as large-scale deforestations, which have been assumed at least for North American biotas (…). This would not only have led to the extinction of arboreal enantiornithines, but, through changes of atmospheric carbon dioxide levels and accompanied oceanic acidification (…), could have also affected the food chains of marine ecosystems. Predominantly terrestrial birds that did not live in forested environments, by contrast, may have been less affected”.

Mayr (2017a: 204f.) furthermore concluded “no small arboreal neornithine birds are known from Cretaceous or even early Paleocene deposits. In the early Eocene, by contrast, stem group representatives of most extant arboreal lineages were already present. It therefore seems well possible that a causal correlation existed between the extinction of the arboreal Enantiornithes at the end of the Mesozoic and the radiation of arboreal Neornithines thereafter.” The absence of arboreal neornithine birds in Mesozoic ecosystems was already highlighted by Mayr (2014), and Mayr (2017b: 1185) further commented on the impact of the K/Pg extinction on the evolution of arboreal birds.

None of the above studies were cited by Field et al., and even though their study provides additional support for the hypothesis that large-scale deforestation around the K/Pg boundary had a significant impact on avian evolution, the omission of pertinent references gives a wrong impression of the novelty of the results.

Mayr, G. (2014). The origins of crown group birds: molecules and fossils. Palaeontol. 57, 231–242.

Mayr, G. (2017a). Avian Evolution: The Fossil Record of Birds and its Paleobiological Significance. Chichester, Wiley-Blackwell, 293 pp.

Mayr, G. (2017b). The early Eocene birds of the Messel fossil site: a 48 million-year-old bird community adds a temporal perspective to the evolution of tropical avifaunas. Biological Reviews, 92, 1174-1188.