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PHYLOGENY AND FOSSIL RECORD OF THE BRACHYPTERACIDAE: A COMMENT ON KIRCHMAN ET AL. (2001)

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IN A RECENT paper, Kirchman et al. (2001) presented a phylogeny of the Brachypteraciidae (ground rollers) that yielded evidence for paraphyly of the genus *Brachypteracias*. On the basis of the results of their study, the authors suggested classification of *Brachypteracias squamiger* (see Langrand 2001, concerning the nomenclature of the species name) into the genus *Geobiastes* in which it was originally described.

Kirchman et al. (2001) further mention the presence of putative fossil ground rollers in the 49 my old deposits of Messel, and state that if these birds indeed were members of the Brachypteraciidae, they would imply an unusually low estimated rate of sequence divergence per million years between the Brachypteraciidae and Coraciidae. Consequently, Kirchman et al. (2001) questioned correct identification of the Messel roller as a member of the Brachypteraciidae, and concluded their study with the remark that placing "Eocene fossils on the coraciiform tree may shed light on the origin of Madagascar's 'primitive' ground rollers."

Incidentally, at the same time the manuscript of Kirchman et al. (2001) was submitted, a study on the phylogenetic relationships between fossil and extant rollers was published (Mayr and Mourer-Chauviré 2000). The cladogram presented therein was based on osteological features and shows essentially the same topology as that of Kirchman et al. (2001), which

resulted from molecular data of mitochondrial genes. In particular, Mayr and Mourer-Chauviré (2000) also found *Brachypteracias leptosomus* to be the sister taxon of all other extant Brachypteraciidae (the exact relationships between which could not be resolved with the then-available morphological data), and proposed classification of *Brachypteracias squamiger* into the genus *Geobiastes*. Derived morphological characters shared by *Brachypteracias leptosomus*, *Uratelornis chimaera*, and the two species of the genus *Atelornis* are a greatly elongated tarsometatarsus and an abbreviated hind toe. The ratio tarsometatarsus:hallux is >4.5 in *Brachypteracias*, *Uratelornis*, and *Atelornis*, compared with 2.8 in *Geobiastes squamiger*, and <2.0 in true rollers (see table 3 in Cracraft 1971). Except for the Todidae, all other coraciiform birds lack greatly elongated tarsometatarsi and that feature clearly is derived within the Brachypteraciidae.

Mayr and Mourer-Chauviré (2000) also provided a formal description of the known specimens of the Messel roller. Although derived osteological features undoubtedly confirm their assignment to rollers, these fossil birds lack the synapomorphic characters that define the crown-group clade including the Brachypteraciidae and Coraciidae. Accordingly, the Messel Roller was classified into a new taxon Eocoraciidae (see Mayr and Mourer-Chauviré 2000 for a discussion of the phylogenetic significance of the morphological differences between the Eocene rollers and their extant relatives).

Fossil members of either the Brachypteraciidae or the Coraciidae are thus unknown

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from early Tertiary deposits and there is no reason to assume that the Brachypteraciidae evolved outside Madagascar. Coraciidae and Brachypteraciidae most likely diverged after the early Tertiary period, which is in concordance with the rather low mitochondrial sequence divergence between Brachypteraciidae and Coraciidae reported by Kirchman et al. (2001).

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