



## Group 6: Morphology

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Comparative anatomy of the intertarsal joint and its bearing on the locomotion of *Hesperornis regalis* (Hesperornithiformes) and *Emeus crassus* (Dinornithiformes).

### **Abstract**

Comparative anatomy of the intertarsal joint and its bearing on the locomotion of *Hesperornis regalis* (Hesperornithiformes) and *Emeus crassus* (Dinornithiformes) A reconstruction of the soft tissues (i.e., collateral ligaments, Lig. anticum, menisci, tendon of the M. fibularis brevis), involved in the mechanism of intertarsal joint stabilization, in two species of extinct birds, *Hesperornis regalis* and *Emeus crassus*, allowed insights into their locomotion. Despite an overall similarity of *Hesperornis* foot to that of a grebe and grebe-like movements of the toes, its “loose” intertarsal joint indicates loon-like movements of tarsometatarsus, thus making the Cretaceous toothed bird a diver of a special kind with a mixture of loon- and grebe-like features in underwater foot-propelled locomotion. The “tight” intertarsal joint of *Emeus*, in contrast, shows the restriction of the tarsometatarsal movements to flexion-extension, a feature that is characteristic for other Ratites and many specialized cursorial birds. The study shows how comparative anatomical data can be valuable in the reconstruction and interpretation of the morphology and locomotion of recent or extinct birds.