

*Preondactylus*, *Scaphognathus*, *Dorygnathus*, *Dimorphodon*, and the *Peteinosaurus*-*Eudimorphodon* clade. This discovery not only adds a new taxon to the Chinese rhamphorhynchoid diversity in the Middle Jurassic, but also further supports a terrestrial radiation of the rhamphorhynchoids from the Europe to East Asia was occurred no later than the Middle Jurassic.

The Evolution of Birds in the Mesozoic: a Symposium in Honor of Cyril A. Walker, Thursday 9:15

#### A NEW BASAL ORNITHURINE BIRD FROM THE LOWER CRETACEOUS OF CHINA

ZHOU, Zhonghe, Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China; ZHANG, Fucheng, Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China; LI, Zhiheng, Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China

A new genus and species of a basal ornithurine bird is reported from the Lower Cretaceous Jiufotang Formation of Liaoning, China. It is represented by a completely articulated skeleton. It is distinguishable from other known ornithurines by possessing a combination of features including at least 16 small and conical teeth on the dentary, scapula strongly curved, a long alular digit extending past the distal carpometacarpus, and length ratio of humerus+ulna+carpometacarpus to femur+tibiotarsus+tarsometatarsus is about 1.2. No uncinata process is observed with the seven articulated thoracic vertebrae. Gastralia are present. The synsacrum appears to comprise at least 9 sacra and fused with the ilia that extends anteriorly to the last thoracic vertebra. The pygostyle is small. The carpometacarpus is well fused at both proximal and distal ends. Both the sternum and keel are elongated, with a prominent external rostral spine. The scapula is strongly curved and shorter than the humerus, with a dorso-laterally directed glenoid facet. The coracoid possesses a well developed procoracoid process, a typical ornithurine "ball-pit" articulation with the scapula, and concave medial and lateral margins. The furcula is "U"-shaped. The humerus has a strape-like head, a large deltoic crest with a convex dorsal margin. All three manual digits retain the unguis. The first phalanx of the major digit is robust but not posteriorly curved. The pubes are slender and symphyseal distally, but not expanded. The fibula is about half the length of the tibiotarsus. The tarsometatarsus is completely fused from proximal to distal end, with the trochlea for Metatarsal III greater than that of II and IV. The associated fish fragments may indicate a piscivorous diet consistent with the dentation of the new bird.

Technical Session V, Wednesday 3:15

#### A NEW DEVONIAN TETRAPODOMORPH FISH AND ITS BEARING ON THE FISH-TETRAPOD TRANSITION

ZHU, Min, Key Laboratory of Evolutionary Systematics of Vertebrates, Institute of Vertebrate Paleontology and Paleoanthropology (IVPP), Chinese Academy of Sciences, Beijing, China; AHLBERG, Per, Subdepartment of Evolutionary Organismal Biology, Department of Physiology and Developmental Biology, Uppsala University, Uppsala, Sweden; ZHAO, Wen-jin, IVPP, Chinese Academy of Sciences, Beijing, China; JIA, Liantao, IVPP, Chinese Academy of Sciences, Beijing, China

A new articulated tetrapodomorph fish from the Famennian Zhongning Formation of Ningxia, North-West China, demonstrates a unique morphology that expands our understanding of morphological diversity in the tetrapod stem group. It shares possible synapomorphies with both elpistostegids and rhizodonts in a way that may challenge the currently accepted wide phylogenetic separation of these two groups. The new animal is a large fish, probably about 2 meters in length when complete, represented by a skull lacking the snout, a well-preserved gill region and shoulder girdle, and a very robust anterior vertebral column. The skull appears to have been broad and blunt-snouted in life, with a flat ventral surface. Characters shared with rhizodonts include extratemporal-supratemporal contact (in this case enclosing the spiracle as a fenestra within the skull roof), a large clavicular spine, and a plate-like scapulocoracoid without foramina. However, in complete contrast to known rhizodonts, the ventral portion of the cleithrum is not expanded but strongly reduced, leaving the scapulocoracoid broadly exposed ventral to the cleithrum and posterior to the clavicle. This resembles the elpistostegid condition, as does the short hyomandibula, which ends at the opercular facet as in *Panderichthys*. Autapomorphies include an extremely flat lower jaw with a large rectangular retroarticular process. The cleithrum lacks an overlap surface for an anocleithrum and the first vertebra is a morphologically distinct atlas articulating with a pair of distinct facets on the occipital arch; these features suggest enhanced mobility of the head relative to the shoulder region, convergent with tetrapods and the tristichopterid *Mandageria*. The new form shows that the diversity and disparity of tetrapodomorph fishes, until now largely documented by fossils from Euramerica and to a lesser extent eastern Gondwana, has been underestimated. Other undescribed tetrapodomorphs from the Late Devonian of Ningxia show different but equally novel character combinations and are likely to impact tetrapodomorph phylogeny in unpredictable ways.

Poster Session II, (Thursday)

#### NOTES ON HINDLIMB MYOLOGY AND SYNDESMOLOGY OF HESPERORNIS REGALIS (AVES: HESPERORNITHIFORMES)

ZINOVIEV, Andrei, Tver State University, Tver, Russia

Partial reconstruction of hindlimb myology and syndesmosis of *Hesperornis regalis* based on the extensive fossil and extant comparative anatomical and functional data shows that this toothed cretaceous bird chose its own way to master foot-propelled diving. Possessing a combination of morphological features characteristic for modern loons and grebes and being in an overall hindlimb anatomy somewhat closer to loons, *Hesperornis regalis* shows maximal known degree of specialization to foot-propelled diving. The acetabular foramen, which is much smaller than in any extant birds, shows that femoral head of *Hesperornis* had much less excursion in comparison to modern Aves. The development of femoral retractors, such as m. iliofemoralis and m. caudofemoralis, exceeds that in modern foot-propelled diving birds, showing greater protractive forces, applied to the femur during the propulsive stroke. Insertion of these muscles on femur is marked by the prominent tuberosity. The propulsive stroke in *Hesperornis* has been carried out by mm. gastrocnemii. The origin of intermedial portion of this muscle reached its maximum extending proximally beyond trochanter major. Ligaments of the knee joint, which show typical avian morphology, allowed a high degree of inward-outward rotation of the tibiotarsus, which has been held close to the body and more likely was enclosed by the thickly feathered skin of the body wall. Flexion-extension movements in the knee-joint were highly reduced, partially by well-developed mm. flexores cruris, m. iliofibularis and postacetabular portion of m. iliotibialis lateralis, and partially by m. femorotibialis medialis, which inserted onto almost entire posterior surface of enlarged patella. The intertarsal joint of *Hesperornis* possessed a high degree of rotational freedom. In this way it resembled that of loons, showing loon-like manner of tarsometatarsal movements. This loon-like manner, however, was combined with grebe-like movements of toes, which undoubtedly had asymmetrical lobes.