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**SOCIETY OF VERTEBRATE PALEONTOLOGY
OCTOBER 2019
ASBTRACTS OF PAPERS
79TH ANNUAL MEETING**

**Brisbane Convention and Exhibition Centre
Brisbane, Queensland
Australia**

October 9-12, 2019

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BRAZILIAN CRETACEOUS FISHES DISTRIBUTION SHED LIGHT ON ECOSYSTEMS IN THE WESTERN GONDWANA

LINDOSO, Rafael M., Federal Institute of Education, Science and Technology of Maranhão, São Luís, Brazil; MAISEY, John, American Museum of Natural History, New York, NY, United States of America; CARVALHO, Ismar D., Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

In north-eastern South America, the biogeographical history of Gondwana has been directly affected by the formation of the South Atlantic and Equatorial oceans. Eustatic sea elevation associated to the warming ocean floor spreading during the Early Cretaceous originated a temporary epicontinental seaway in the Northeastern Brazil. Hypotheses regarding its possible route of ingressions have not been consistent. However, recent paleontological data concerning Aptian-Albian fossil fish assemblages in Brazilian Northeastern Marginal and Interior Basins (BNMIBs) have suggested a biotic relation with Tethyan ichthyofaunas. The Lower Cretaceous Santana Formation of the Araripe Basin has provided the best known fossil fish record in South America. The oldest fishes occur under brackish/hipersaline conditions but with intermittent marine connections, which is indicated by species of the genera *Vinctifer*, *Rhacolepis*, *Notelops*, and *Araripichthys*. The fossil fishes of the Santana, Codó and Riachuelo formations show a greater similarity to each other than to assemblages from other BNMIBs. This suggests greater connectivity between the depositional environments dominating the Araripe, Parnaíba and Sergipe-Alagoas basins during the late Aptian. However, a recent reassessment of fossil fishes from the Codó Formation (Aptian; Parnaíba Basin) revealed distinct species among some of the genera shared with other BNMIBs (e.g., mawsoniids, aspidorhynchids, and clupeomorphs). This suggests a degree of separation between the depositional environments in these basins. Except for a few works concerning the Santana Formation, controlled excavations have not been conducted in strata containing these fossil fishes. The fossil fish distribution patterns in BNMIBs probably result from vicariance and/or dispersal events, related to transgressive/regressive episodes that controlled sedimentation within the basins. Thus, an understanding of the evolution of the ecosystems of western Gondwana requires a comprehensive understanding of stratigraphic and tectonic provincialism in order to refine biostratigraphic significance and correlation of the fossil fish assemblages.

Grant Information:

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Technical Session X (Friday, October 11, 2019, 10:15 AM)

THE BEAST OF MÜHLHEIM: FIRST EVIDENCE OF A SOLNHOFEN MEGAPLANKTIVORE

LISTON, Jeff, BSPG, Munich, Germany; HEYNG, Alexander, BSPG, Munich, Germany

As the first animals to successfully occupy the large (> 1 m Standard Length, SL) vertebrate suspension-feeding niche, pachycormid osteichthyans were the Mesozoic ecological forerunners of today's cetacean (mysticetes) and chondrichthyan (*Rhincodon* and *Cetorhinus*) planktivores. At their acme in the Callovian (Middle Jurassic), suspension-feeding pachycormids were growing to sizes in excess of today's whale sharks (*Leedsichthys*, estimated SL 16 metres), achieving a scale of growth unequalled by subsequent osteichthyans. Until recently, the largest suspension-feeding pachycormid in the Upper Jurassic Plattenkalk fauna was the 1.9-2.3 metres long *Asthenocormus*, although occasional discoveries had suggested that there might be something larger. Anomalous pectoral fins in the BSPG, Munich, since 1951 were >3x any recorded specimen of *Asthenocormus* (0.5x *Leedsichthys*), with a highly non-asthenocormid shape. In 2009, a tail ray specimen was found in the Mühlheim quarry (Upper Jurassic, Mörnsheim Fm), exhibiting the classic pachycormid characteristic of bifurcating without segmentation, to a length of around 90cm, 3x longest recorded for *Asthenocormus* (0.5x *Leedsichthys*). In 2015, the pit also yielded highly elaborate gill rakers more than twice the length of those commonly seen in *Leedsichthys*, and substantially more robust.

Although virtually meaningless to estimate the size of such an animal from these small components of its gill basket, it is the first evidence that the Upper Jurassic in Southern Germany may have had a significantly larger suspension-feeding pachycormid than the Middle Jurassic *Leedsichthys*, indicating that the Plattenkalk deposits preserve even more of a diversity hotspot than previously suspected, with the apex of Mesozoic suspension-feeding unexpectedly represented in this ecosystem.

PROGRESS IN THE STUDY OF PALEOGENE ICHTHYOFAUNA FROM ONSHORE BASINS AROUND BEIBU GULF OF CHINA

LIU, Juan, SUNY University at Buffalo, Buffalo, NY, United States of America; CHEN, Gengjiao, Natural History Museum of Guangxi, Nanning, China; CHANG, Mee-mann, Institute of Vertebrate Paleontology & Paleoanthropology, Beijing, China

Paleogene sediments are well developed in the onshore basins, including Ningming, Nanning, and Baise Basins of Guangxi, Sanshui and Maoming Basins of Guangdong, and Changchang Basin of Hainan, China, around the Beibu Gulf (Gulf of Tonkin). As fieldwork and research activities progressed, the picture of the Paleogene ichthyofauna of this region is gradually unveiled. Cypriniforms were the dominant fish in terms of specimen numbers and taxonomic diversity, which spanned from the Paleocene to the Oligocene and occurred in every basin of this region, including: (1) Cyprinidae: *Eoprocypris maomingensis* from late Eocene Youganwo Formation (Fm.) of Maoming Basin, *Cyprinus*-like cyprinid from late Eocene Nadu Fm. of Baise Basin, *Huashancyprinus robustispina* and *Ecocarpia ningmingensis* from Oligocene Ningming Fm. of Ningming Basin, *Nanningocyprinus wui* from Oligocene Yongning Fm. of Nanning Basin, and some undescribed new forms; (2) Jianghanichthyidae (the only fossil family of the order Cypriniformes and only occurred in South China): *Jianghanichthys sanshuiensis* from Paleocene Buxin Fm. and a new species of the same genus from early Eocene Huachong Fm. of Sanshui Basin; and (3) Cobitidae: *Cobitis nanningensis* from Oligocene Yongning Fm. of Nanning Basin. These fishes are among the oldest cypriniform fossils, which provide critical information on the origin and evolution of the order Cypriniformes. Along with cypriniforms, there are osteoglossiforms, siluriforms, and perciforms from Sanshui Basin; siluriforms and sharks from Maoming Basin; siluriforms and clupeomorphs from Nanning and Baise Basin; and ellimmichthyiforms, siluriforms, and gobiiforms from Ningming Basin. The Oligocene ellimmichthyiforms from Ningming represents the youngest member of the order so far. The Oligocene gobiiforms from Ningming is the first occurrence of fossil gobiiforms in China. Furthermore, shark materials and possibly marine ellimmichthyiform and siluriforms are discovered in this region alongside abundant cypriniforms, a group of primary freshwater fishes, which indicate that the freshwater bodies of this region were invaded occasionally by marine water during the Paleogene.

To sum up, the Paleogene ichthyofauna from onshore basins of Beibu Gulf consists of oldest fossils of major clades of Cenozoic fishes and a relict of typical Mesozoic fish taxa, which suggest that this region is an evolutionary hotspot of Cenozoic freshwater fishes, especially of cypriniforms.

Grant Information:

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Regular Poster Session IV (Saturday, October 12, 2019, 4:15 - 6:15 PM)

NEW TETRAPODS FROM THE SUNJIAGOU FORMATION AND SHANGSHIHEZI (UPPER SHIHOTSE) FORMATION, SHANXI, CHINA AND ITS IMPLICATIONS

LIU, Jun, Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, Beijing, China; YI, Jian, Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, Beijing, China

In China, the outcrops of the Sunjiagou Formation and Shangshihezi Formation have most widespread distribution among synchronous terrestrial late Permian deposits. However, only pareiasaurs among tetrapods have been reported from the Sunjiagou Formation, and only one tetrapod fossil locality is known for the Shangshihezi Formation. Up to now, the tetrapod diversity from two formations is low, and dicynodonts, one common Permian tetrapod group, have never been reported from them. In contrast, dicynodonts are abundant and the tetrapod diversity is much higher for the Naobaogou Formation, which only distributes within a small basin.

In 2017, a partial pareiasaur skeleton was discovered from the upper portion of the Shangshihezi Formation at Shouyan, Shanxi, China. In 2018, three dicynodont specimens and one pareiasaur specimen were collected from the Sunjiagou and Shangshihezi formations. These dicynodonts show closely relationship with those from the Naobaogou Formation. One mandible displays some unique features among dicynodonts, such as long retroarticular process with anteroposterior length roughly equal to the height of articular, midline trochlea directs posterolaterally rather than posteromedially. Furthermore, one skull shows close relationship with one dicynodont species