Characteristics of reproduction and newborns of Keichousaurus hui. (Reptilia Sauropterygia) from Xingyi Fauna(Ladinian,Middle Triassic),Guizhou Province

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Abstract

The morphology and reproduction of Mesozoic Marine reptiles is still controversial and attract the attention all over the world. Because of its small size and special preserved method, Keichousaurus hui, which lived 230 million years ago, provides a large number of samples for our study. Keichousaurus hui is yielded from the Xingyi fauna in Zhuganpo member of the Falang Formation of the Latin Period of the Middle Triassic in South China, living near shore. The body length of the Keichousaurus hui is about 5_˜50 cm, the head is triangular, the snout is short pointed, and three groups of holes could be seen from the front, namely the nostril, the eye hole and the superior temporal hole. Keichousaurus hui owns typical ribs with a thick head and a pointed tail almost as long as the backbone, so it is classified as Pachycodonidae. The living environment of Keichousaurus hui belonged to the bay environment surrounded by islands on three sides. In this period, the bay had weak hydrodynamic force, shallow water, sufficient light, normal salinity and abundant organic matter, which was very suitable for the survival of marine reptiles. With the mid-to-late Latin transgression events, the original environment was destroyed, and the rising sea level flooded the basin environment and connected the vast ocean, and the original shallow sea biota went extinct. The Falang Formation is mainly composed of laminaceous limestone and dark medium and thin laminaceous argillaceous limestone, which indicates that the environment was of low energy anoxia in the period, and the anoxia in the platform basin caused the rapid death of Marine organisms living in the basin.

A large number of Keichousaurus hui fossils provide more information of the morphological characteristics and reproductive methods. The sex difference of Keichousaurus hui can refer to the sex difference of Pachypleurosaurus, mainly showing the difference in the humerus. The rationality of this method can be further confirmed by pregnant specimens of Keichousaurus hui. The researchers found dozens of female Keichousaurus hui during pregnancy and childrearing period, described and measured the morphology of embryos and newborn individuals of Keichousaurus hui. It was found that the fetus of Keichousaurus hui appeared from the maternal birth canal with the head first, and had the characteristics of multiple viviparous birth. The female Keichousaurus hui that produced the most fetuses could conceive up to 11 each time.Two different forms of birth of female Keichousaurus hui have been found, which are presumed to be related to the environment. This study provides more information for the reproductive mode and delivery state of Marine reptiles and reconstructing the growth of ancient reptiles.

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