



The Identification of the Tapejarid Dorsal Vertebrate Number and its Implications for the Evolution of the Tapejaridae

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Abstract: The Tapejaridae is the pterosaur clade comprises *Tapejara*, *Thalassodromeus*, and all descendants from their most recent common ancestors (Wu et al., 2017). Tapejarid pterosaurs have a huge nasoantorbital fenestra that over 1/3 the length of the skull and a developed cranial crest. Tapejarids have been reported from the Cretaceous (Barremian to Cenomanian-Turonian) of Asia, Europe and South America, with the most abundant specimens discovered from China and Brazil. Based on the pterosaurs assemblage and isotopic dating results, tapejarid pterosaurs are supposed to be living in western Liaoning, China, then dispersal to the Araripe Basin, northeastern Brazil, during the Early Cretaceous period (Wang and Zhou, 2006). Recently, a new specimen, LPU 1535, was discovered from the Crato Formation, which was considered as a tapejarid by bearing a pelvic plate with pubis and ischium fused together at the ventral margin. This new specimen shows a complete dorsal vertebrate series of twelve vertebrae. The first four have been fused together forming the notarium, with the following one in the process of fusion. The last two are fused with sacral vertebrae and part of the synsacrum. The notarium and dorsal vertebrate in synsacrum have never been reported from Chinese tapejarid materials, even the specimens with larger size than LPU 1535. Moreover, the dorsal vertebrate number is various in Chinese tapejarid specimens that preserved complete series, from 13 to 15 (Lü et al., 2006; Zhang et al., 2019; unpublished specimen). LPU 1535 displays not only the reduction of dorsal vertebrae, but also less free dorsal vertebrae, which implies that tapejarid pterosaurs had developed a solid body after migrated from China to Brazil. Furthermore, the solid body is probably the adaptation of faster flying speed, which implies a different life style and living environment.

Key words: Dorsal vertebrate, Tapejaridae, Western Liaoning, Araripe Basin, Cretaceous

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