New basal synapsid supports Laurasian origin for therapsids

Jun Liu, Bruce Rubidge, and Jinling Li

The distant evolutionary ancestry of mammals is documented by a rich therapsid fossil record. While sphenacodontid synapsids are considered the sister-group of therapsids, the place of origin of therapsids is an enigma, largely because of a long standing morphological and temporal gap (Olson’s Gap) in their fossil record. We describe a new large predatory synapsid, Raranimus dashankouensis gen. et sp. nov., from the Middle Permian of Dashankou in China which has a unique combination of therapsid and sphenacodontid features. This specimen is of great significance as it is a basal therapsid which is the sister taxon to all other therapsids. The fact that it was found in association with Early Permian tetrapods (Anakamacops and Belebey) suggests that it is the oldest therapsid and provides the first evidence of therapsid–bearing rocks which cover Olson’s Gap. It further supports that therapsids may have had a Laurasian rather than Gondwanan origin.

Key words: Therapsida, Dashankou, Permian, Laurasia, China.

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