Topography and Geology of Khorat Geopark

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Abstract

Khorat Geopark is situated in the middle to lower Lam Takhong Basin in Nakhon Ratchasima Province, Northeast Thailand. The geopark covers 5 out of 32 districts in the province, Sikhio, Sung Noen, Kham Thale So, Mueang Nakhon Ratchasima, and Chaloem Phra Kiat, extending from 14° 40' 31” to 15° 08’ 59” N Latitude and 101° 23’ 51” to 102° 23’ 49” E Longitude. The total area is 3,167.38 km². The geopark can be divided into 3 topographical regions: 1) mountainous area with cuestas in the west and southwest, 2) undulating plains in the center and south, and 3) flat plains in the northeast. The highest and lowest points are 782 and 163 meters above mean sea level, respectively. The major rivers flowing through the geopark are the Lam Takhong and Mun River. Khorat Geopark is a part of the Khorat Plateau that is underlain by Mesozoic rocks of the Khorat Group, consisting of sandstone, conglomerate, siltstone, mudstone, shale, claystone, and rock salt. The rising of the Himalayas 65 to 55 million years ago caused lifting and folding of the rock layers of the Khorat Group to form a plateau and a basin. Alternating layers of more and less resistant rock has resulted in the formation of 2 rows of cuestas in the western geopark region. In the center, the Early Cretaceous Khok Kruat Formation has yielded numerous fossil reptiles, including 3 new species of iguanodont dinosaurs and new species of turtle and crocodile. In the east, fluvial sediments, 60 m thick, from Neogene to Quaternary, have yielded 3 new species of fossil mammals, *Khoratpithecus piriyai*, an ancient orangutan, *Merycopotamus thachangensis*, a possible hippopotamus ancestor, and *Aceratherium porpani*, a hornless rhinoceros. Ten genera of ancient elephants have been recovered, out of 55 genera known worldwide: *Gomphotherium*, *Prodeinotherium*, *Protanancus*, *Tetralophodon*, *Zygolophodon*, *Stegolophodon*, *Deinotherium*, *Sinomastodon*, *Stegodon*, and *Elephas*. More than 20 other mammal species have been obtained as well as abundant fossil wood, fruits, seeds, and pollen. Five geological features of international significance, ranked in order of importance, are 1) the
high diversity of fossil mammals, especially elephants, from Neogene to Quaternary deposits, 2) deposits of iguanodont dinosaurs and associated animals from the Early Cretaceous, 3) sources of abundant and diverse petrified wood, 4) the type locality of the Khok Kruat Formation in the Khorat Group, and 5) a prominent section of the Khorat cuesta, one of the longest cuesta systems in the world.

**Key words:** Khorat cuesta, Khorat Group, Petrified wood, Ancient elephants, Iguanodont