

Floodplain Paleosols in the Phu Kradung Formation of the Mesozoic Khorat Group, NE Thailand

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The Mesozoic continental deposits are widely distributed in Southeast to East Asia. These nonmarine deposits are called the Khorat Group in northeastern Thailand, which is composed mainly of fluvial facies yielding some vertebrate fossils. The Khorat Group consists essentially of claystones, siltstones, sandstones and conglomerates. Stratigraphically, the Khorat Group can be divided into six units in descending order namely Khok Kruat, Phu Phan, Sao Khua, Phra Wihan, Phu Kradung and Nam Phong Formations (Mouret et al., 1993). Though many studies mention about the depositional environments and vertebrate faunas, few study focused on the development of paleosols. The paleosol can provide us appropriate information of paleoenvironments, such as depositional setting and paleoclimate. Therefore, we treated with the Phu Kradung Formation, which contains many paleosol horizons. The objective of this study is to clarify paleoenvironments based on paleosol features and paleosol-bearing sequences. The studied section is located in Nong Bua Lamphu. The outcrop of this section is well exposed continuously about 500 m along the road No. 210. This section corresponds to the uppermost part of the Phu Kradung Formation. The section is composed mainly of sandstones, mudstones and subordinate conglomerates. The thickness of this sequence is about 300 m. We can recognize more than 8 cycles of fining-upward sequence in this section, which suggest the deposition in the meandering river system. The floodplain deposits contain many paleosol and reworked paleosol horizons. Most prominent feature of these paleosols is calcretes, which are usually formed under the climates from 50 to 1000 mm in annual precipitation. These calcretes are occurred as various shapes of nodule and most of them are related with root traces. The some features of calcretes under the microscope indicate that precipitation mechanism was biogenic origin. The sequence of floodplain deposits indicates that the few amounts of sediment supply and frequent erosional events occurred in the floodplain. It is concluded that the floodplain in the Phu Kradung Formation was relatively stable, stored high degrees of biological activity and had some vegetation where paleoclimate was subhumid to arid.