

Geomorphological development of Eastern Mongolian plain, Mongolia

Ulambadrakh khukhuudei (1) and Orolzodmaa otgonbayar (2)

(1) Department of Geology and Geophysics, National University of Mongolia (ulambadrakh_h@yahoo.com), (2) Research Center of Geology and Mineral Resource, National University of Mongolia (orolzodmaa@gmail.com)

Several summaries and investigations of the geomorphological description and feature for Eastern Mongolian plain (EMP), the one of the largest geomorphological district, fully covering east side of Mongolia (Murzayev, 1949; Vlodavets, 1950, 1955; Marinov, Khasin, 1954; Marinov, 1966; Nikolayeva, 1971; Selivanov, 1972; Chichagov, 1974, 1976; Grigorov, 1975; Korjuyev, 1982; Syirnev, 1982, 1984) had been publishing continuously. But literature for geomorphology of EMP have been not appeared during over the past 20 years. However, we re-combine the geomorphological development of EMP, according to the results of many publications for surrounding regions of Russia and China and unpublished maps.

Main morphology of EMP has the plain, containing with aeolian, fluvial and lacustrine landforms. Plain morphology defined that denudation plains to North Kherlen, South Kherlen, Baruun Urt, Uulbayan, Delgerekh and other which developed on the Paleozoic rocks, layered plain to Choibalsan, Tamsag, Ongon, Gert, Sumiin nuur and Torey– on the Late Cretaceous and Neogene sediments and accumulation plain with alluvial and lacustrine origin such as Menen, Buir nuur, Tamsagbulag, Khalzan and other.

These plains of EMP related with tectonics and structure of region and inherited the development of the Mesozoic, particularly Late Mesozoic structure. Large basins of EMP are Tamsag, Choibalsan and Torey and other small basins - from 7-10 km to 25-30 km width and rather a several 10 km extend, cutting a basement.

The origin of plain morphology for EMP is interpreted as two main stages of the geomorphological development model, based on geology.

In first stage or Late Jurassic (?) – Lower Cretaceous period, there was developed rift basin, then, in second stage or since Late Cretaceous period, plain morphology originated from the intermountain basin that dominated by exogenic process and kept in current EMP area. Data relevant to the development history of EMP are following.

1. Rift volcanism – K-Ar age for Mesozoic volcanic rocks from Eastern Mongolia and Ikh Khyangan dated in range from 160 to 110Ma (Shuvalov, 1987; Makhbadar et al., 1995; Zhou et al., 2006; Bat-Ulzii, 2014).
2. Rift controlling fault – Delgerekh, Modon Ovoo and Matad faults to north-east direction are interpreted and presented in EMP (Khasin, 1973; Tikhonov, 1974; Byamba, 2009).
3. Basin and Range topography – we are interpreting that Nukhet davaa mountain range, Tamsag basin, Matad uplift or range and Choibalsan basin were developed in that time. Hills with 40-150 m height at a present day are interpreted that they developed from the Late Cretaceous period.

In post- rift or Late Cretaceous period, lakes disappeared and whole area of Eastern Mongolia became a dry land, dominating by exogenic process.

Denudation planation surface at EMP are kept in high and low level. High or old planation surface is proposed by age of the Miocene – Lower Pliocene and low or young planation surface – Late Pliocene.

Just a current topography of EMP is formed in Late Neogene – Lower Quaternary period as a peneplain.