[JJ] Evening Poster | B (Biogeosciences) | B-CG Complex & General

[B-CG09]Decoding the history of Earth: From Hadean to the present

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The latest results of Earth's evolution and geological processes through 4.6 billion years from Hadean to Modern, based on various approaches including fieldworks, chemical analyses, experiments and computer simulation, will be presented. In this session, we aim to discuss and understand causal relationships and interplay among the evolution of Earth's deep interior, changes in the surface environments, and development and evolution of life. Wide-ranging topics are accepted.

[BCG09-P13]Lithostratigraphy and detrital zircon geochronology of the Upper Cretaceous Bayanshiree Formation in the East Gobi Desert, Mongolia

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The Upper Cretaceous Bayanshiree Formation in the East Gobi Desert contains various vertebrate fossils (Shuvalov, 2000). The lowermost layer of the formation is composed of basalts, and yields K-Ar ages of 101-92Ma (Shuvalov, 2000). The uppermost layer of this formation has been dated as Coniacian-Santonian on the basis of molluscs (Shuvalov, 2000). However, the precise deposition age of the Bayanshiree Formation has not yet been determined due to lack of key-beds. In this study, in order to reveal the paleo-environment of the Bayanshiree Formation, we focused on the Khongil Tsav, which is one of type localities of the Bayanshiree Formation, and applied lithostratigraphical and geochronological analyses to that area.

The Bayanshiree Formation in the Khongil Tsav can be subdivided into two units: Unit 1 and Unit 2 from bottom to top. The Unit 1 consists of coarse to fine grained sandstone and massive mudstone. Each thickness is 0.1-4.0 m and 0.2-2.0 m, respectively. The composed rocks of the Unit 2 are the same as the Unit 1, and the thickness of sandstone and mudstone are 0.2-7.5 m and 0.1-1.0 m, respectively. Trough crossbedding and ripple lamination are recognized in both units. A red-bed mudstone, whose thickness is 4.0-7.5 m, is also recognized in the lowest part of the Unit 2. These sedimentary facies clearly show that the Bayanshiree Formation is fluvial sediment. Moreover, several fining-upward sequences, which are 3.0-6.0 m thick in Unit 1 and are 5.0-10.0 m thick in Unit 2 are also found. Those sequences indicate that the fullvial system gradually increased from the Unit 1 to the Unit 2. The red-bed mudstone is slightly thinner southeast than northeast. The northwestward-thickening trend and paleocurrent from northwest in the Unit 1 to southwest in the Unit 2 is therefore attributed to faster subsidence in the northwest.

Zircon U-Pb dating of 26 sandstone samples collected from the area have been analyzed by laser-ablation inductively coupled plasma-mass spectrometry (LA-ICP-MS). As a result, the youngest ages (YA) obtained from the samples are almost the same values, which are ca. 130-120 Ma. The YA are significantly older than the deposition age of the Bayanshiree Formation recognized from the molluscs. This results are consistent with acid igneous activities near Mongolia had not occurred after ca. 120 Ma (Yarmolyuk et al., 2015). The

age histogram obtained from the studied samples show four clusters of ages: (1) Early Cretaceous (ca. 130-120 Ma), (2) Late Devonian-Middle Jurassic (ca. 380-170 Ma), (3) Cambrian-Early Devon (ca. 540-400 Ma) and (4) Proterozoic (ca. 2000-750 Ma). The same trend is also confirmed in the other localities of the Bayanshiree Formation. Those results suggest that sediment supply of terrigenous clastics to the Bayanshiree Formation was not significantly changed. Under the paleo-continental setting, zircon U-Pb ages of ca. 2000-750 Ma show that source area of the formation was the Siberia craton(e.g. Donskaya et al., 2012; Priyatkina et al, 2016). The Relationships between Mongolia and the Siberia craton has unchanged since Cretaceous. Thus, large-scale fluvial systems, which were distributed from Mongolia to the Siberia Craton and 6,000,000 km², could have resulting in sediment supply of the formation.