DIGITAL 9th International Conference on UNESCO Global Geoparks

제9차 유네스코 세계지질공원 총회

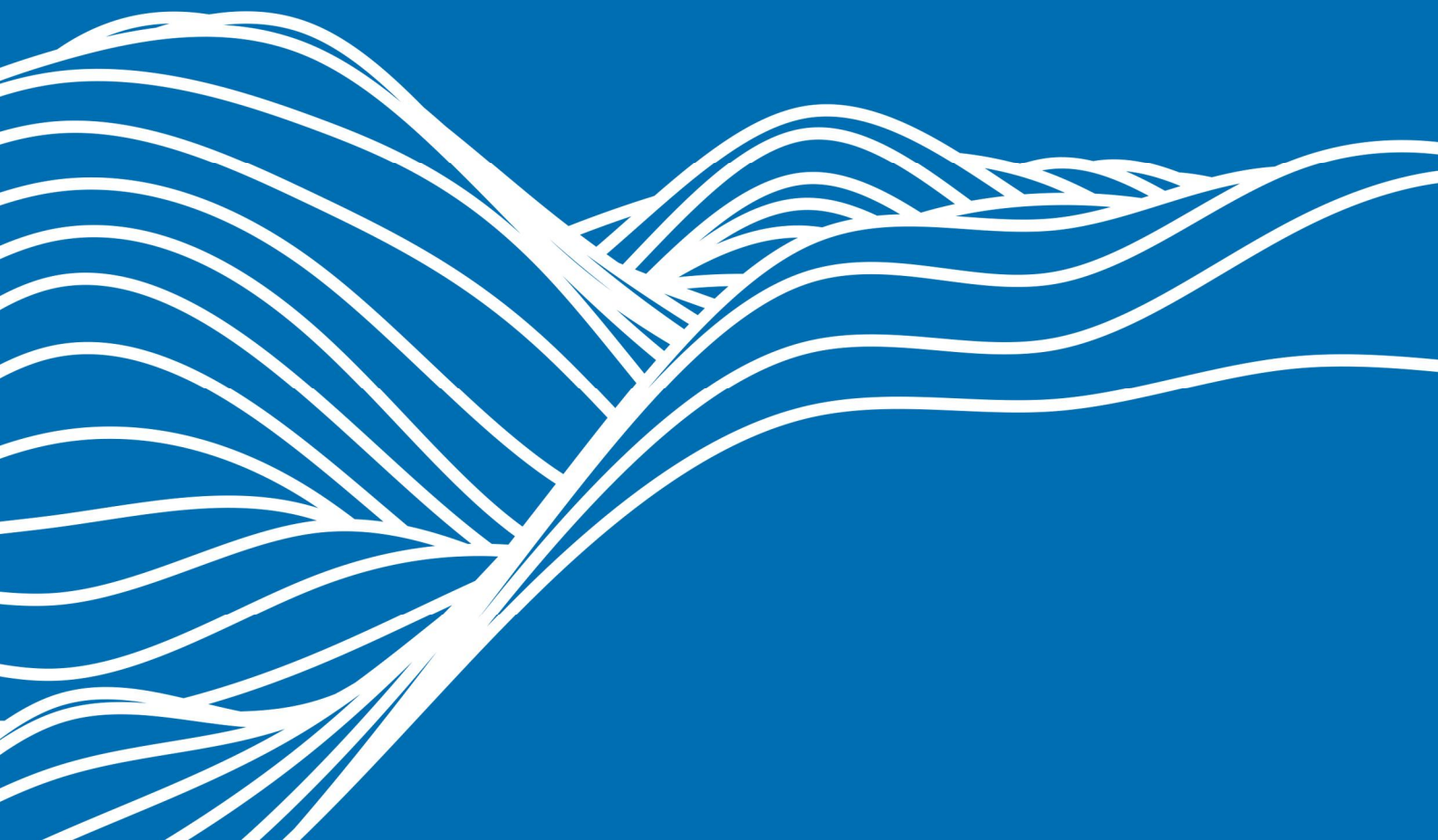
12-16 December, 2021
Jeju Island UNESCO Global Geopark, Republic of Korea
2021.12.12-16, 제주도 세계지질공원

FUN GEOPARK IN JEJU

Jeju 제주특별자치도
Jeju Special Self-Governing Province

DIGITAL 9th
International Conference
on UNESCO Global Geoparks

Poster



Depositional ages and provenance of the Upper Cretaceous Dadaepo Formation in the Dadaepo Basin, Busan, South Korea.

Yong-Un CHAE[1], Sujin HA[1], Young Ji JOO[2], Hee-Cheol KANG[1], Hyoun Soo LIM[1],*

Pusan National University[1] Korea, Republic of , Pusan National University[1] Korea, Republic of , Pukyung National University[2] Korea, Republic of , Pusan National University[1] Korea, Republic of , Pusan National University[1] Korea, Republic of ,

The Late Cretaceous Dadaepo Basin is distributed on a small scale in the southern part of the Busan Metropolitan City, South Korea, and it is bordered by the Yangsan Fault to the west and the Dongnae Fault to the east. The basin is a pull-apart basin formed by sinistral strike-slip movement of these faults. The Dadaepo Formation, which is basin-fill, is largely divided into the lower Dadaepo Formation deposited from the alluvial fan to plains and the upper Dadaepo Formation deposited from the lacustrine, and there is a massive pyroclastic rock (ignimbrite) between them with a thickness of about 2.5 m. In previous study, the whole-rock Ar-Ar ages of the dacitic rocks below the lower Dadaepo Formation and the basaltic andesite lava flow above the upper Dadaepo Formation were reported to be about 94 Ma and 69 Ma, respectively (Cho et al., 2011). However, the depositional age of the Dadaepo Formation is still in debate. In this study, therefore, detrital zircon U-Pb dating was performed to obtain information on the maximum depositional ages and sediment provenance of the Dadaepo Formation. Samples were collected from the upper (01DP-1, 01DP-3) and lower (11DP-1, 01DP-6, 01DP-4) Dadaepo formations and pyroclastic rocks (11DP-2) at the boundary. Then, zircon grains were separated from the collected samples and their U-Pb ages were measured using LA-MC-ICPMS equipment in the Korea Basic Science Institute (KBSI). From a total of 432 analytical points, 416 valid points were obtained, excluding points showing discordance of 10% or more. Except for 11DP-2 and 01DP-1 samples, most samples show wide age ranges from Precambrian to Cretaceous. In particular, Permian ages (299-252 Ma) were obtained in the 11DP-1 (29 points), 11DP-2 (2 points), and 01DP-6 (2 points) samples. Rocks showing especially the Early to Middle Permian age are mostly located in the SW part of the Japanese archipelago and near the eastern coast of the Korean Peninsula, so it is very likely that the zircons originated from the eastern part of the Dadaepo Basin. It is believed that this can be determined more reliably through further study on chert clasts including radiolarian fossils from the lower Dadaepo Formation. From the youngest zircon age cluster in each sample, the maximum depositional ages of the Dadaepo Formation were calculated to be ca. 98 (01DP-4), 97 (01DP-6 and 11DP-1) Ma in the lower Dadaepo Formation, ca. 94 (11DP-2) Ma in the boundary pyroclastic flow, and about 93 (01DP-1 and 01DP-3) Ma in the upper Dadaepo Formation.

Keywords: Busan Geopark, Dadaepo Basin, zircon U-Pb dating, Provenance, Paleogeography

Corresponding author: chae@pusan.ac.kr

Reference:

Hyeongseong Cho, Jong-Sun Kim, Moon Son, Young Kwan Sohn and In-Soo Kim, 2011, Petrography and40Ar/39Ar ages of volcanic rocks in the Cretaceous Dadaepo Basin, Busan: Accumulation time andcorrelation of the Dadaepo Formation. Journal of the Geological Society of Korea. v. 47, no. 1, p. 1-18

Geological Characteristics of the Yanggu Terra alba Used for a Major raw Material of the Joseon White Porcelain

Donwon CHOI[1], Hyeongsoo KIM[2],*

Gangwon Province[1] Korea, Republic of , Korea University[2] Korea, Republic of ,

The Yanggu terra alba, a geosite in Gangwon Peace Area National Geopark, occurs on the Bangsan-myeon, Yanggu-gun, Gangwondo, and used for a major row materials of the Joseon White Porcelain based the historical literatures of the Joseon Dynasty. However, there are no study results for geological characteristics of the terra alba and protoliths. Thus this study aims to understand origin and formation of the Yanggu terra alba based on the geological features including rocks and mineral compositions and their structure. The Yanggu terra alba occurs within fault zones that mainly composed of the Precambrian quartz- and biotite schist, and the Jurassic biotite granite as protoliths. The terra alba mainly composed of quartz, muscovite (illite), chlorite, feldspar, calcite, and kaolinite. The grains are poorly sorted and displays subangular to angular in roundness. Muscovite (illite) has probably formed by hydrothermal alteration of feldspar and biotite in the protoliths. Therefore it suggests that the Yanggu terra alba has formed as fault gouge. In general terra alba and yellow soil used for materials of porcelain has generated from a residual deposit, but the Yanggu terra alba used for materials of the Joseon White Porcelain has uniquely formed by hydrothermal alteration and shearing associated with faulting. In the future, it is necessary to compare it with Cheongsong terra alba in Cheongsong Global Geopark.

Keywords: Yanggu terra alba, fault gouge, hydrothemal alteration, illite, Joseon White Porcelain

Corresponding author: cave4@korea.kr

Reference:

Ahn, S. and Hwang, H., 2013, Study of material character_x0002_istics by a componential analysis on the whiteware from the Kiln of Chiljeon-ri, Bangsanmyeon, Yanggu-gun. Journal of Conservation Science, 29, 261-277 (in Korean with English abstract).Song, K.-Y. and Cho, D.-L., 2009, Geological report of the Mandaeri sheet (1:50,000). Korea Institute of Geoscience and Mineral Resources, 60 p (in Korean).

Research on Geodiversity of Korea: Another Beginning

JUNG SEUNGHO[1],*
National Research Institute of Cultural Heritage, CHA[1] Korea, Republic of ,

Since 2010, the National Research Institute of Cultural Heritage of CHA has been conducting field research on geodiversity by region to discover and promote new resources (geology, topography) with high national conservation value. Starting with the Gangwon-do in 2011, the results for Gyeongsang-do, Chungcheong-do, Jeolla-do, Gyeonggi-do, Jeju-do (planned in 2022) were sequentially relesaed. Through reviews of literature materials (e.g., ancient books and old maps) in advance, and numerous field surveys conducted with local historians and geology and topography experts, new geological heritages (265 cases) in various subfields were newly discovered.GIS distribution maps of cultural heritage have already been established and information on the remaining areas is provided to the public, whereas the distribution map construction project for geological heritages, which are also managed as buried cultural properties, has only recently started.Accordingly, the undesignated geological heritage obtained from the geodiversity survey in Korea is used as data in the distribution map construction project for systematic conservation and management. In the case of point-level fossil and rock specimens, basic work is underway to prepare an integrated database through a series of procedures in accordance with the Buried Cultural Heritage Act and securing an inventory.In addition, by conducting regular monitoring of major geological heritages (natural monuments) that are exposed to the outdoors and vulnerable to natural disasters and climate change, efforts are being made to respond appropriately to each site condition and type. In the future, the purpose is to prepare conservation and management measures suitable for each heritage's characteristics.Despite such wide distribution and diversity of geological heritage including fossils, caves, and special terrain, the public's interest or awareness of geological heritage is very low compared to tangible and intangible cultural assets, and they have been relatively marginalized due to development and economic logic Therefore, a multifaceted approach is needed to systematize their conservation and management and to revitalize natural heritage.

Keywords: Geodiversity of Korea, Natural Heritage, GIS distribution map, Buried Cultural Properties

Corresponding author: jungsho@korea.kr

Reference:

This study was carried out through the Research on Geological Diversity on the Korean peninsula and Natural Monument Fossil Sites (NRICH-2105-A15F-1) of the National Research Institute of Cultural Heritage, CHA.