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Geochemical Characteristics and Deposition Period of The Paleolithic Site Sedimentary section in the Seoul Region, Korea

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More than 100 Paleolithic sites have been excavated across the Korean Peninsula, showing a widespread distribution. Notable sites include the Jeongok-ri, Suyanggae, and Seokjang-ri sites, which are internationally recognized. This study analyzes the sedimentary layers of two Paleolithic sites excavated in Seoul to interpret their depositional environment.

The first site is located in the Yongsan area, where a 20-meter borehole core was obtained for research. XRF core scanner analysis was conducted on a 15-meter section of the core. This study focuses on the geochemical analysis of elements commonly found in clastic sediments, specifically analyzing the ratio of Al and Ti contents. The Al and Si contents showed significant variation in the 5-meter section, where major changes in the sedimentary facies were observed. In the upper 1–2 meters, different geochemical characteristics were noted compared to the lower sections. Particularly, in the 2–5 meter section, both Al and Si contents gradually decreased towards the upper layers, indicating a progressive decline in clastic particle input from river sources. In contrast, the 8–12 meter section showed minimal variation in element contents, suggesting sediment deposition under a relatively stable environment with a consistent influx of similar mineral particles. Below 12 meters, a sharp decrease in element content was observed, which is interpreted as the influence of coarse-grained particles such as gravel or coarse sand, leading to abrupt compositional changes.

The Paleolithic artifacts were found at a depth of 6–7 meters, and OSL (Optically Stimulated Luminescence) dating on coarse-grained particles exceeded the measurement limits. Therefore, the site is estimated to be older than 110,000 years. Additionally, at the Gayang-dong site in Seoul, a 2-meter sedimentary layer was analyzed. The XRF results revealed multiple variations, which are interpreted as being influenced by river migration and climate change. A comparative analysis between XRF and carbon isotope data showed a relatively consistent trend. In conclusion, geochemical analysis provides valuable insights into the depositional environment of sedimentary layers. A comprehensive interpretation using multiple proxy data is essential for a more detailed understanding of the sedimentary history.