



A discontinuity in the late Pleistocene alluvial deposits, Hwacheon-ri, Gyeongju, Korea: Occurrences and paleoenvironmental implications

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Sedimentary discontinuity surface occurs in the late Pleistocene alluvial deposits exposed along the cliff (about 10 m thick and over 140 m in length) in stream side, Gyeongju, Korea. The discontinuity surface is laterally extensive and marked by distinct carbonaceous dark horizon in the middle part of the deposits. The deposits are divided into lower and upper units by the discontinuity surface. The lower unit overlies unconformably the Cretaceous andesitic rock (basement), and consists of braided-river deposits. Lower part of the lower unit is mainly composed of lenticular-bedded and clast-supported conglomeratic deposits, whereas gray to dark gray sandy to muddy channel-plug deposits occur in the uppermost part of the lower unit. It is characteristic that iron-oxide crusts occur in the lower unit. They are cutting across the lower unit and truncated by the overlying upper unit. Rootlets mineralized by vivianite are present in the channel-plug deposits below the discontinuity surface. The upper unit overlying the lower unit with erosive contact (discontinuity surface) is mostly composed of matrix-supported conglomeratic alluvial fan deposits. Hornfelsic gravels are common in the lower unit, whereas andesitic gravels are predominant in the upper unit, suggesting the provenance change from the lower unit to the upper unit. OSL ages for the lower and the upper units are 125 ± 9 ka and 94 ± 9 ka, respectively, suggesting that the lower unit was deposited in MIS5e and the upper unit was formed in MIS5c to 5b. It is thus interpreted that the shift of depositional environment from a fluvial plain (lower unit) to an alluvial fan (upper unit) was an alluvial response to sea level change inducing fall of base level in an alluvial basin from the interglacial to the glacial stages. The development of iron-oxide crusts and diagenetic vivianite in the discontinuity surface suggest that humid condition persisted during the paleoclimatic shift from the last interglacial to the last glacial stages.

Key words: Late Pleistocene, Alluvial deposits, Discontinuity, Iron-oxides, Vivianite