

Evidences of Quaternary Morpho Pedological Milieu, Recorded in Granitic Regoliths of Korea

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In Korean Peninsula (particularly in South Korea), the distribution of thick granitic regoliths (10m and more in thickness) is wide spread. This study aim: to elucidate morpho pedological milieu, based on the clay mineral composition and the structures of these detritic deposits, Results of this research can be summarized as follow.

1. Most of the samples from different regions in South Korea contain two groups of clay minerals:
 - a) clay of second mineral state, such as kaolinite, smectite, ... (called second mineral clay), produced by chemical weathering, Kaolinite is the most representative of this group, whereas chlorite, vermiculite, smectite and interstratified clay (ex. 10 14, 14, 14y, 14y, 14s) appear in low proportion.
 - b) clays of first rock forming mineral state, such as quartz, feldspars, micas (illite) ... (called "first mineral clay"), produced by physical mechanisms from various origin. Quartz, feldspars, micas are representative of group.

Presences of two groups of clay indicate that the granitic regoliths have been formed through polygenetic processes.

Kaolinite, the most important second mineral clay in the granitic regoliths of Korea, signifies weathering milieu more warm and humid than nowadays, in which chemical alteration is active and characterized by kaolinitisation. This type of milieu may be related to the paleo climate in Quaternary Interglacial ages (ex. the Mindel Riss) which were more warm and more humid than the Holocene.

First mineral clays, that appear in high proportion indicate the presence of very cold milieu with high relative humidity, in which microgelifraction play an important role in disintegration of granitic rocks. This type of weathering milieu corresponds to the circumstance of Quaternary Ice Ages (probably the Würm).

- 2) Most of the thick granitic regoliths show macro/micro-structures directly or indirectly associated with the action of deep freezing and thawing: laminated structure, compact laminated structure with silt caps, stratification distinguished by banded Bt horizons ... etc.. These cryopedological structures are found even more than 10m in depth. This fact indicate the presence of long persisting ground ice in Quaternary cold periods.

These cryogenic structures are generally well conserved in lower part of profile. But in upper part of profile they are disturbed or disappeared by a group of surface dynamics (mass movement, pedogenesis, cryoturbation, bioturbation, hydroturbation, ...). Their disturbed modalities indicate that most of the thick granitic regolith had been affected by gelifluction (fast frost creep) and podzolisation in the last ice age (Warm). In nowday circumstance, granitic regolith disturbed by this type of morphopedogenesis are submitted to erosion by surface water and to brumfication.