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Holocene Paleosols of the Upo Wetland, Korea

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ABSTRACT

The Upo wetland, the largest natural wetland in Korea, is located in Changnyeong-gun, Gyeongsannam Province (35°33′ N, 128°25′ E), and 70 km upstream from the Nakdong River estuary. Unlike most other Korean wetlands that have been destroyed under the name of economic development, the Upo wetland has been able to preserve its precious ecosystem throughout the years. Thanks to increased public awareness about natural wetlands and environmental conservation, the Korean Ministry of Environment designated the Upo wetland an 'Ecological Conservation Area' on July 26th, 1997. On March 2nd of the following year, the Upo wetland (8.54 km^2) was designated a 'Protected Wetland' in accordance with the international Ramsar Treaty.

A 4.49m long (from 9.73 to 5.24 m in altitude) UP-1 core (35°33′05″N, 128°25′17″E), recovered in the marginal part of the Upo wetland, is divided into eight buried paleosol units of different ages on the basis of the abundance of color mottles and vertical color variations (Aslan *et al.*, 1998). Radiocarbon datings suggested that the paleosol profile represent the last 5700 years.

The entire section of the core was more or less subjected to pedogenetic processes, and shows very weak to moderate soil profile development. These Holocene paleosols are therefore regarded as synsedimentary soils of deluvium (deposits formed by floods) origin (Sycheva *et al.*, 2003).

Unit 1 to 5 paleosols are generally silt-rich and exhibit moderate profile development. The boundaries between the units are somewhat distinguishable, but not so clear cut. This is due to variable repeated combination of accumulation, denudation and soil forming processes within various periods. Mottle textures gradually decrease in abundance with increasing clay content in Unit 6, which results in weak profile development. The lower boundary of Unit 6 lies around about 2000 yrBP, the beginning of Subatlantic in Korea (Kim *et al.*, 2001). Abrupt sediment textural change is detected in Unit 7, which is interpreted to indicate the human activities on the Upo wetland. Unit 8 represents the recent soil forming processes.

The preliminary results of this ongoing study imply the primary factor for pedogenetic processes is the water table fluctuations related to the sedimentary textures like grain size distributions, and the geomorphological stability of the Upo wetland.

Keywords: Holocene, Upo wetland, paleosols, water table fluctuations, geomorphological stability

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