Stratigraphy of the Chuseki-so in the northern part of the Arakawa Lowland and the Menuma Lowland, Central Japan

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1.Introduction

In Kanto plain, a lot of researches in the coastal alluvial lowlands revealed structures of the Chuseki-so and geomorphic developments in response to the abrupt sea-level rise since the Last Glacial Maximum (Kaizuka et al, 1977; Saito,1995 etc.). On the other hand, lowlands where marine area did not reach in Jomon transgression have not been adequately studied. To understand how and how far sea-level changes influenced geomorphic evolution of alluvial lowlands, it is necessary to study about inlands.

The purpose of this study is to clarify stratigraphy of the Chuseki-so and geomorphic development in the upper and middle part of the Arakawa and the Menuma Lowland, central Kanto Plain, based on analysis of boring cores and borehole log data.

2.Methods

The incised valley fill in the upper part of the Arakawa Lowland is divided into G_1u, S_1l_1, S_1l_2, S_1m, and S_1u in ascending order(Ishihara et al,2008). Using them as standard stratigraphy, a lot of geomorphic-geological profiles were drawn by using more than 1,500 borehole log data to clarify continuity of the Chuseki-so from upstream to downstream.

3.Results and Discussions

G_1u is continuous with BG downstream. It also continues to a buried valley incised by the paleo Tone River in the northern part of the Menuma Lowland. Meanwhile, it is presumed that the paleo Ara River developed a fan and it joined the buried valley of the paleo Tone River.

S_1l_1 is flood plain sediment mainly composed of gravely sand and gradually changes to gravel layer upstream, while to alternation of sand and mud downstream. This suggests that the flood plain and the alluvial fan in the buried valley gradually backstepped with response to transgression.

S_1l_2 is flood plain sediment mainly composed of silt and clay, and can be correlated with marine deposit associated with the Jomon transgression(Ishihara et al,2008). Its deposition in the northern part of the Menma Lowland indicates that flood plain retreated upstream direction corresponded with the marine transgression.

After ca.6000yBP, S_1m, composed of mainly sand, began to deposit. Advance of The Kumagaya Fan by 6000calyBP(Saotome et al,2007) suggests increase of sediment supply. S_1m also deposited shallow buried valleys in the Kazo area, eastern of the Menuma Lowland. It is indicated that distributaries of the Tone and the Ara River began to flow eastward into the valleys. In the middle part of the Arakawa Lowland, progradation started at ca.7000yBP when sea-level slowly rise to be stable (Endo et al,1989; Ando and Hochigai,1997). Tributaries from the Kanto Mountain like the Iruma River joined and supplied much sediment to the middle part of the Arakawa Lowland, thus probably regression began earlier.

Ca.4000-2000yBP, the Tone River got to flow to the Kazo area and did not flow through the Arakawa Lowland. Thus the rate of sedimentation decreased and fine sediment (S_1u) deposited in the Arakawa Lowland.

This study revealed that geological evolution of the Chuseki-so in the Arakawa and the Menuma Lowland have been influenced by fluvial process of the Tone and the Ara River controlled by sea-level change since the Last Glacial Maximum This insight is important in understanding correlation between geomorphic development of alluvial lowlands and sea-level changes.