

East Asia Monsoon Changes since Last-Deglaciation Based on Carbon Isotope Ratio of Cellulose Analysis in Peat Bog, Japan

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This study is the first high-resolution climate records from terrestrial archive (peat) in the Northeast Japan, to reconstruct the Asian Monsoon climate variations during the last deglaciation to Holocene. About 50 radiocarbon data of bulk sediments and sphagnum in 8.8 m-long peat sediment core were used for accurate age model in this study. The bottom of the core reached to 15.5 cal kyr BP and accumulation rates ranges from 11 cm/kyr to 172 cm/kyr. The significant relatively higher rates (> 100 cm/kyr) and lower rates (< 30 cm/kyr) would be consistent with abrupt climate changes during the last deglaciation to Holocene recorded in Greenland Ice core records (GISP2). Asian Monsoon associated continental water cycle in the summer during abrupt climate changes were investigated using carbon isotope ratio of cellulose. The results of carbon isotope ratio showed clear variations on higher values during warm periods (Bolling-Allerod warm period, Preboreal warm event) and lower values during cold periods (Younger Dryas cold period, 8.2 ka). Similar patterns of carbon isotope ratio were reported in the previous study in Hani peat bog, at Northwest China (Hong et al., 2005). In addition, the hydrogen isotope ratio of plant wax n-alkanes from same site showed also carbon isotope ratio depleted values in the cold periods (Seki et al., 2009). All these results from Northwest Pacific (this study site) and Northeast China (Hong et al., 2005, Seki et al., 2009) suggest wet summer in the cold periods and dry summer in the warm periods. On the other hand, these results had anti-phase synchronization from carbon isotope ratio of Tibet significantly influenced with Indian Monsoon, suggesting that it is dry summer in the cold periods (Hong et al., 2003). This patterns of Tibet were in agreement with the southern part of China significantly influenced with Asian Monsoon (Wang et al., 2001), which had characteristics of dry summer in the cold periods.