

## Abrupt cooling event during the middle Holocene from pollen data of marine costal sediments in Uchiura bay, northern Japan

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Holocene climate records provide valuable information for inferring past interaction between humans and environment. We present well dated pollen data covering the last 7,000 years from Uchiura bay in southern Hokkaido, northern Japan, in order to better understand the change of human population for the Jomon sites around northern Japan. In addition, we show the palaeoclimatic reconstructions since the middle Holocene from the pollen data, using the best modern analogue technique (MAT). The pollen-based quantitative palaeoclimatic data in Uchiura bay indicate that small-scale cooling events took place at ca. 4.2-4.5 ka cal BP, 2.3-2.4 ka cal BP, and ca. 1.0-1.2 ka cal BP. From the data, the temperature at ca. 4.2-4.5 ka cal BP drastically decreased about 1.5 °C. The cooling at the period corresponds to the decrease of alkenone-SST in Uchiura bay and other palaeoclimatic records throughout East Asia. We can suggest that the abrupt cooling event at ca. 4.2-4.5 ka cal BP influenced human activities and population during the Jomon period in northern Japan.

Keywords: pollen data, palaeoclimatic reconstruction , modern analogue technique , Uchiura bay, northern Japan