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14C analyses of sedimentation periods for shell middens at Higashimyo site, Saga prefecture

Toshio Nakamura^{1*}

¹Center for Chronological Research, Nagoy

The Higashimyo archeological site is located in huge Saga Plain, the largest in western Japan, at the northern end of Saga city, in Northern part of Kyushu. The Saga plain faces southwards the innermost part of Ariake bay, a bay of 15 km wide and 90 km long with relatively shallow water depths. A huge volume of shell fragments were accumulated at the Higashimyo site, and the most impressive archeological interest is that more than 400 of baskets knitted with twisted ropes made of thinly sliced wood were recovered. The knitted wooden baskets excavated here are the oldest (ca. 7800-7900 cal BP) recorded in the earliest Jomon period in Japan.

Six shell middens were detected at the Higashimyo site, and No.1 and No.2 middens were intensively excavated. For the No.1 midden, thickness of the mound was ca. 1.2m and the elevation of the uppermost layer was -1.1m, and for the No.2, the respective values were 1.5m and -0.5m. The starting and ending layers and several layers in between at No.1 and No.2 middens were 14C dated to estimate the duration period of the shell mound. We have collected shell fragments and terrestrial plant remains from the full layers, from the bottom to the top, of the two middens for 14C dating, to estimate the duration necessary to make up the total volume of the middens. Geographically it was certain that the middens had been formed during the sea-level-rising period a few thousand years after the start of Holocene.

The followings are revealed concerning the chronology of the Higashimyo site.

(1) According to 14C ages for terrestrial nuts for No.1 and No.2 middens, the sedimentation started almost the same time at around 8000 to 7850 cal BP for both middens. The termination time of accumulating shell fragments was, however, different. The No.1 shell middens stopped accumulation at 7950-7850 cal BP, and the No.2 did at 7800-7700 cal BP.

(2) Both terrestrial plants and marine shells were dated for both middens. 14C ages for the terrestrial plants are younger than those for the marine shells, by about 300-350 years. This apparent age difference is from the ocean reservoir effect. However, since the age difference is not established yet firmly (Nakamura et al. 2007), we adopted 0 years as the local reservoir correction value for the ocean reservoir effects, for further analysis.

(3) Our estimates yielded relatively shorter duration periods, i.e., 50-150 years and 150-250 years for the No.1 and No.2 middens, respectively.

Keywords: 14C age, Jomon shell midden, archeological site, sedimentation period, Jomon transgression, ocean reservoir effect