

Holocene paleoenvironmental changes based on ostracode and sedimentary analyses at the western part of the Kawachi plain, Osaka, Japan

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The Osaka Plain is divided into West-Osaka plain and Kawachi plain on Uemachi Upland. Based on the analysis of Ostracoda remains in Holocene sediments, Holocene paleo-biological changes of West-Osaka Plain have been become clear by Yasuhara et al. (2004), but Kawachi Plain is not enough similar studies. This study, in order to gain insight into the Holocene paleo water changes in Kawachi plain, carried out the analysis with ostracoda remains, CNS chemical measurements, using Sakuranomiya-higashi core (SH core) samples drilled at located at Paleo-Yamatogawa river valley in Kawachi plain (lat.:34°42'0.5"N, lon:135°32'5.5"E, alt.: +0.5 m ASL, drill length: 18 m).

Lithology of SH core is divided into 4 units such as SH-1, SH-2, SH-3, SH-4 in ascending order. SH-1 (-19.50 to -17.60 m ASL) consists of fine sand and silt with fining upward from -19.13 m to -18.38 m. The lower half part of SH-2 (-17.60 to -16.92 m ASL) consists of medium sand and includes shell fragments. The upper half part (-16.92 m to 17.00 m ASL) consists of mainly fine sand. SH-3 (-16.00 to -8.90 m ASL) is composed of silt to clay with shell fragments. Volcanic glass shards correlated with the K-Ah tephra are included in the -14.9 m horizon. The lower part of SH-4 (-8.90 to -6.90 m ASL) consists of clay and silt with plant fragments and trace fossils. The middle part of SH-4 (-6.90 to -3.30 m ASL) consists of clay, silt, and fine sand with coarser graining upward, and the upper part (-3.30 to -1.60 m ASL) is composed of fine sand.

Ostracodes were found -15.01 to -7.01 m ASL in 85 sediment samples. Based on Q-mode cluster analysis of these ostracodes, Assemblage zones of this core are divided into 4 zones such as A, B, C and D in ascending order. Zone A (-16.01 m ASL) dominant *T. scabrocuneata* indicating sandy mud environment in head of the bay. Zone B (-16.01 to -13.21 m ASL) dominant *B. bisanensis* (inhabitat of inner muddy bay) and *T. niitsumai* (inhabitat of sandy mud), and *Pntocythere* spp. (inhabitat of littoral zone) are dominant in comparison with other horizons. Zone C (-13.11 to -9.21 m ASL) is characterized by *B. bisanensis* (inhabitat of muddy environment of inner bay) and *Bicornucythere* sp. U (inhabitat of inner muddy bay), and is divided into 3 sub-zones. In sub-zone C1 (-12.51 to 11.31 m ASL), *B. bisanensis* suggesting enclosed inner bay environment is dominant. In sub-zone C2 (-12.51 to 11.31 m ASL), *K. japonica* indicating muddy mid-bay environment. Its acme horizon of -11.71 m ASL (6400 cal BP) suggests the maximum flooding surface. In sub-zone C3 (-11.21 to 9.01 m ASL) *Bicornucythere* sp. indicating muddy mid-bay environment increases with *A. obai* suggesting mid-bay environment. Zone D (-8.91 to 7.61 m ASL) is dominant *Bicornucythere* sp. M, which inhabit brackish water at ca. 5 m water depth.

Based of CNS contents analysis, in the horizon from -17.5 to -16.5 m, TOC contents and C/N ration are nearly 1.4% and 12 with each other. These values suggest the inclusion of terrestrial plant components plants and the sediment deposition in reductive environment. This situation suggests estuary environments formed along the paleo-river mouth with salt wedge. Because C/N ratio increases upward from -16.5 m and reaches nearly 15 at the uppermost horizon, organic matter supply by terrestrial plants has increased in this horizon.

Consequently, environmental change in this area is as follows. Holocene transgression extended into this area at 9 ka. Through coastal environment at 8 ka, the littoral environment of inner bay with water depth from 5 to 10 m spread at 7 ka. The central bay environment with water depth of 15 m extended at the maximum relative sea level of 6.4 ka. Through muddy bay environment with water depth from 10 to 15 m around 6 ka, water depth rapidly became shallower, and brackish water environment with water depth less than 5 m extended at 5.5 ka. This area eventually changed to fresh water environment at 3.7 ka.

Keywords: Ostracoda, CNS contents analysis, Osaka plain, inner bay, paleoenvironmental changes