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Late Holocene environmental changes of the inter-ridge marshes in the western Hamamatsu strand plain

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In the western Hamamatsu strand plain, beach ridges are well developed and divided into six bars, which are named the BR 1 to 6 from landward to seaward by Matsubara (2004). While Matsubara (2007) suggested that BR1 emerged at ca. 4000 yr BP and the other series of beach ridges (BR2 to BR6) were formed during regressive stage, however, paleo-enviromental change in the inter-ridge marshes closed by the beach ridges was not clear. We performed geological survey, diatom analyses and radiocarbon dating to reconstruct the Late Holocene environmental change of the inter-ridge marshes in the western Hamamatsu strand plain.

The inter-ridge marsh between the BR1 and 2 is distributed at ˜3.5 km inland from the present coastal line. Surface geology of the site A, located at the northern margin of this marsh, consist of a sand layer and a mud layer in ascending order. In the mud layer, peaty mud layer between T.P. -1.0 to -1.7 m and T.P.-0.1 to -0.4 m, Amagi-Kawagodaira tephra (Kg, 3126-3145 cal BP) at T.P.-1.0 m and some sandy layers are found. The lower part of sediment of site A between T.P. -1.23 to -1.76 m is characterized by dominance of fresh-brackish water diatom species such as *Staurosira construens* and *Synedra tabulata* and accompanying a few brackish-marine water diatom species such as *Amphora ventricosa*. These diatom taxa indicate that this zone deposited at the brackish water condition such as a river mouth. In the range of between T.P. -1.08 to -1.18 m, *Cyclotella striata*, brackish-marine water planktonic species, increased up to approximately 20% and showed temporal salinity increase. Sediment above T.P. -1.02 m is characterized by abundant fresh water diatom species such as *Pinnlaria* spp. and *Eunotia* spp., suggesting fresh water marsh. Radiocarbon datings and Kg tephra of the site A indicated the transition from brackish to fresh water event occurred at ca. 3200 cal BP.

The inter-ridge marsh between the BR3 and 4 is distributed at ˜2 km inland. Surface geology is composed of sand layer, massive clay layer and peaty layer. Some sandy layers ranging from a few millimeters to 25 cm thickness are recognized in the clay and peaty layer. Diatom assemblages from the clay layer and the lower part of the peat layer at Site B and C were different from those in the lower part of the peaty layer. Fresh-brackish water diatom species such as *S. construens* and *S. tabulata* were often found in the clay layer and the lower part of the peat layer with some fresh water diatom species, *e.g. Navicula radiosa*. In contrast, the upper part of the peaty layer were characterized by fresh water diatom species such as *Aulacoseira granulata*, *A. ambigua* and *Fragilaria* spp. Timing of this transition from brackish water to freshwater pond was estimated ca. 3100-3200 cal BP based on radiocarbon datings.

Timings of development of fresh water pond/marsh at the two inter-ridge marshes were almost simultaneously. In the western Hamamatsu strand plain, tidal area changed to fresh water marsh/pond around 3200-3400 cal BP in two drowned lowlands (Sato *et al.* 2011, Sato and Kashima, 2012) and synchronous with those in the inter-ridge marshes. Formation of the fresh water pond at the inter-ridge marsh between BR3 and 4 and wide distribution of the BR4 suggests that emergence of the BR4 caused this environmental change. Further, temporal salinity increase before the fresh water pond/marsh formation around 3200-3400 cal BP was synchronous among site A and the two drowned lowlands. These results suggest that sea-water flowing into lagoons before 3200-3400 cal BP occurred commonly in the plain.

Reference
Matsubara, A.2004. The Hiyoshi Review of Social Sciences, 14, 35-52.
Matsubara, A.2007. The Hiyoshi Review of Social Sciences, 18,1-13.
Sato, Y. and Kashima, K. 2012. The 32nd meeting of the Japanese Society of Diatomology.
Sato, Y. *et al.* 2011. Geographical review of Japan series A, 84-3, 258-273.

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