Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SGL38-P01 Room:Convention Hall Time:May 25 18:15-19:30

Invitation to the Tabuchi section, central Japan: A candidate GSSP for the Lower-Middle Pleistocene Subseries/Subepoch

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The Tabuchi section is a continuous marine sedimentary succession exposed in the Boso peninsula and is a Lower - Middle Pleistocene boundary GSSP candidate.

From the geological advantages and the easy access to the outcrops, the Tabuchi section seems to be the most suitable for the Lower - Middle Pleistocene boundary GSSP.

Geological characteristics

∗Tabuchi section is only candidate representing the Pacific realm.
∗Thick L - M Pleistocene sedimentary succession (>3000 m) (2.4 ? 0.5 Ma) .
∗Well exposed along the Yoro River with high sed. rates (ca. 2 m/kyr) & no visible breaks.
∗Well preserved calcareous nannofossils, planktonic foraminifera, diatoms.
∗Standard section for Japanese Pleistocene tephrostratigraphy (>50 ash beds).
∗Well established d18O isotope stratigraphy: Kokumoto Fm. corresponds to MIS 20?18.
∗M?B boundary is located ca. 1 m above a distinctive, widespread tephra bed (Byk-E).
∗High-precision U-Pb zircon age of the Byk-E.
Consistent with the latest astrochronology of marine sediments and Antarctic ice core.
∗A basis for immediate comparisons between, magnetostratigraphy, biostratigraphy, O isotope stratigraphy, absolute ages (40Ar/39Ar & U-Pb), and astrochronology.
∗Taking the M?B boundary as the primary guide to the L?M Pleistocene boundary, the Byk-E bed would serve as an appropriate level for the GSSP.

Access

There are well developed public transportations. You can reach to Tabuchi section within 2 hours from Tokyo and 3 hours from both international airports. There are big car parks. There are lodge and toilet.

The access to the Tabuchi section is very easy and convenient by car, bus and train with very small walk.

Keywords: Tabuchi section, Lower and Middle Pleistocene

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Detailed Tephra Catalog of Lower to Middle Part of the Kazusa Group, Lower to Middle Pleistocene, Central Japan

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The Kazusa Group covering the Boso Peninsula, central Japan is one of the typical lower to middle Pleistocene geological formations in the country. It is composed of the continuous sediment formed in deep sea and coastal regions. It is known as reservoir of the water-soluble natural gas and iodine rich brine. The stratigraphic division of the Kazusa Group has been done based on lithofacies of the formations and occurrence of tephra layers. The existence of tephrostratigraphy has been confirmed resulting in the revision of the tephra catalog to be part of the geological research for the Quadrangle Series 1:50000 of the Mobara district, eastern part of Boso Peninsula. The confirmed tephras consist of 139 layers from O7 in the Otadai Formation to Ks4 in the Kasamori Formation. These include the Byk-E (Ku2.3) tephra which indicates the base of the middle Pleistocene formation. Each tephra was identified by refractive index measurement and EPMA analysis of volcanic glass orthopyroxene and hornblende. The oxygen isotope stratigraphy of a coetaneous stratum in the Choshi district, northeastern part of the Boso Peninsula was already determined. Hence it is be possible to determine the MIS age of each tephra by correlating the tephras in both districts.

Keywords: Lower to Middle Pleistocene, Upper to Middle Part of the Kazusa Group, Tephra Catalog, Mobara District, Boso Peninsular, Chiba Prefecture

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Detailed stratigraphy of diatom assemblages from a core of the Kokumoto Formation collected in the Boso Peninsula, Japan

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Diatom analyses were conducted on a core of the Kazusa Group in the Boso Peninsula, central Japan, to reveal stratigraphic variations of diatom assemblages across the Matsuyama-Brunhes magnetic polarity boundary (MBB). The core is 54 m long collected near the Chiba section along the Yoro River, a candidate for the GSSP of the Early-Middle Pleistocene boundary. Stratigraphic variations of diatom assemblages in response to the glacial eustatic sea-level changes shown by the planktonic marine oxygen isotope record from *Globorotalia inflata*. Diatom assemblages in the lowermost part of the core are dominated by extinct species of *Actinocyclus ingens*, often observed in reworked deposits in the Kazusa Group. This part is correlated with the earliest stage of marine isotope stage (MIS) 19, and is dominated by reworked deposits that were accumulated during a low sea-level period. The extinct species suddenly decrease at a horizon of about 5 m below the Byakubi tephra (ByK) layer, during a gradual sea-level rise. Turbidity currents may have still affected the sedimentation at the site, although the lithology shows no turbidite layer above a horizon of about 8.5 m below the ByK. Above a level of 5 m below the ByK, marine littoral diatoms such as *Paralia sulcata* and *Cyclotella striata* become dominant, and have a peak at about 3 m below the ByK, coinciding with the lightest oxygen isotope value correlated with MIS 19.3. Above the peak abundance, the proportion of *P. sulcata* gradually decreases, and *A. ingens* re-increases at about 3m above the ByK, with a maximum at about 7m above the ByK, where marine isotope data show a maximum value. The re-increase of extinct diatom species suggests a sea-level drop. Thus the maximum of *A. ingens* at about 7 m above the ByK may be correlated with the MIS 19.2 sea-level lowstand. Therefore, the MBB that lies at 1 m above the ByK occurs between MIS 19.3 and 19.2. *A. ingens* can be used as a proxy of reworked deposits in the Kazusa Group.

Keywords: Kokumoto Formation, Paralia sulcata, Actinocyclus ingens, MIS19, Matsuyama-Brunhes boundary, GSSP

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The Tokyo Bay Unconformity and the Mandano Ice Age

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The Kanto fore-arc basin in the Kato plain is an extremely deep submarine basin that was formed during the early Pleistocene. The sediments in the basin change from deep-sea sediments to lacustrine-alluvial sediments, the Mandano formation which is up to 95 m in thickness and overlays the Tokyo Bay unconformity that is widely distributed under Tokyo bay area. The formation consists of three parts. The lithofacies in the lower part on the unconformity gradually change, with decreasing depth, from sand to gravel. The lithofacies of the middle part are muddy. The upper part changes with increasing depth from gravel to sandy shilt by transgression.

The lower part and lower half of the middle part comprise sediments characteristic of a topset fan delta (Nirei H., 1997) in the regression stage. The upper half of the middle part and upper parts are composed of transgression sediments.

The lower half of the middle part contains sediments from the ice age regression stage, evidence of which is provided by the cold-index plant remains,Picea maximowiczii, Tsuga diversifolia,Fagus crenata, Cryptomeria japonica, etc., present in the uppermost part of the lower half.

Geological analysis reveals the Kanto continental shelf to extend widely under the Kanto Plain; it is also underlaid by a range of bottom set sediments in distinct formations and forest sediments, also in distinct formations, in ascending order under the conformity.

Keywords: Tokyo Bay Unconformity, Mandano Ice Age, Kazusa Group, Shimohusa Group, Kanto Continental Shelf

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Paleomagnetic and paleoenvironmental studies for the U-M Pleistocene boundary Tukabara Formation

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The Tukabara formation distributed along the Tukabara coast, Minamisoma City, Fukushima Prefecture, which is considered to have been deposited at early part of the last interglacial period, since the sediments suggested a transgression that leads to the marine isotope stage 5e. The base of the Tukabara formation consists of a basal gravel layer and the Tagashira tephra bed which is detected at the MIS 5/6 boundary in the Images MD01-2421 core taken from off Kashima, Pacific side of the central Japan. The main part of the formation consists of a 7 meter thick varved siltstone including enough diatom and pollen fossils to reconstruct paleoenvironment. Previous paleomagnetic studies reported a reversed polarity from this siltstone layer which was correlated as the Blake excursion. Here we report results of reexamined paleomagnetic and rock-magnetic analyses.

The silt layer, consisting of the main part of the Tukabara formation, is divided into following three parts based on paleomagnetic characteristics; Upper Zone: unstable magnetization direction after both of alternating-field thermal demagnetizations, Middle Zone: stable magnetization direction after both of alternating-field and thermal demagnetizations, Lower Zone: stable magnetization direction after alternating-field demagnetization but after thermal demagnetization. Rock magnetic and paleomagnetic experiments exhibit that the Upper Zone of the siltstone has significantly low magnetization intensities which is supposed to be due to a weak geomagnetic field caused by the Blake excursion during the depostion.

We will also report preliminary results of paleoenvironmental reconstruction using microfossil analyses. Diatom fossils were produced from all of the silt stone layers. Based on diatom assemblages, the silt layer is divided into three parts as follows; Diatom Zone 1: a marine genera dominance zone at the bottom part, Diatom Zone 2: freshwater genera dominance zone at the middle part, Diatom Zone 3: marine genera dominance zone at the top part. In the Diatom Zone 2, a shallow water genus Rhaphoneis is not seen and a freshwater cosmopolitan species Diploneis elliptica is abundant. Furthermore, a lot of varves can be well observed this Zone. This indicates that the zone is supposed to be deposited under a stagnant condition caused by a closed estuarine like environment with a fresh water discharge.

Keywords: Upper-Middle Pleistocene boundary, Paleomagnetism, Paleoenvironmental reconstruction, Blake event