Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

SGL44-01 Room:421 Time:May 2 14:15-14:30

Distribution of stratigraphic units of Middle Pleistocene Izumiyatsu Formation and their arsenic concentrations

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We identified the strata units of the Pleistocene Izumiyatsu Formation, which extends from the central part of Chiba Prefecture to the northeast, and the distribution of arsenic in these strata. In our summary of the geology, we refer to the Shimofusa Group.

It is possible to divide the facies of the Izumiyatsu Formation, a type locality, into five beds ? a muddy sand layer (facies 1: an estuarine sediment), an interbed of fine sand and mud (facies 2: a tidal flat sediment), a sand layer (facies 3: a tidal channel sediment), a silt layer (facies 4: a freshwater?seawater marsh sediment), and a medium sandy mud layer (facies 5: a inner bay marine sediment). The Izumiyatsu Formation, with changing facies, exhibits the following distribution pattern: facies 1, 2, 3, 4, and 5 in the southwest area, facies 5 only in the central area, and facies 4 and 5 in the northeast area. Only facies 5 is continuously distributed throughout the research areas.

Silt layer(Facies 4), the freshwater?seawater marsh sediment, has lower arsenic concentrations in sediment and in leachate than the other facies. Facies 5, the inner bay sediment, has higher arsenic concentrations in sediment and in than the other facies.

Keywords: Member unit, Groundwater flow, Arsenic

SGL44-02 Room:421 Time:May 2 14:30-14:45

Chronology of Brunhes-Matuyama geomagnetic polarity transition recoreded in sediments and climate change

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Channell et al. (2010) suggested that the midpoint of the M-B boundary lies at 773.1 ka, ~7 kyr younger than the previously accepted astrochronological age for this polarity reversal (780-781 ka). Their results are based on the five high-resolution Matuyama-Brunhes polarity transition records from the North Atlantic placed on isotope age models produced by correlation of the d18O record to an ice volume model. They further inferred that the 40Ar/39Ar Fish Canyon sanidine (FCs) standard age that best fits the astrochronological ages is 27.93 Ma, which is younger than the two recently proposed FCs ages of 28.201 +- 0.046 Ma (Kuiper et al., 2008) and 28.305 +- 0.036 Ma (Rene et al., 2010). However, recent study by Ganerod et al. (2011) suggested an age of 28.393+-0.194 Ma for FCs based on paired 40Ar/39Ar and 206Pb-238U radiometric dating supporting the calibrations of Kuiper et al. (2008) and Renne et al. (2010). Furthermore, recent study by Rivera et al. (2011) suggested an age of 28.172+-0.028 Ma for FCs based on cross-calibration with an astronomically tuned age of A1 tephra sanidines in the studied sequence of Faneromeni section in Crete. The discrepancy is significant that needs to be investigated carefully especially in terms of climate system involved.

On the other hand, the age model for relative paleointensity stack PISO-1500 (Channell et al., 2009) is based on IODP U1308 from North Atlantic. Channell et al. (2008) developed the age model for U1308 by correlating the benthic oxygen isotope curve with LR04 oxygen isotope stack (Lisiecki&Raymo, 2005). LR04 stack is known as oxygen isotope stack for benthic foraminifarra, whose age model is dependent on ice volume model with a certain time lag. Caballero-Gill et al. (2012) developed an absolute age model based on U-Th dating for stalagmites from China and correlated the oxygen isotope curve with that on planctonic foraminiferra for a deep-sea core from South China Sea. On the basis of the radiometrically calibrated chronology, they estimated that the time constant of the ice sheet is 5.4 kyr at the precession band and 10.4 kyr at the obliquity band. These values are significantly shorter than the single 17 kyr time constant originally estimated by Imbrie et al. (1984), based primarily on the timing of terminations I and II and the 15 kyr time constant used by Lisiecki and Raymo (2005) for LR04 stack.

In the presentation, the chronology of Brunhes-Matuyama geomagnetic polarity transition will be further discussed in relation to the chronology of 10Be records of EPICA Dome C (Dreyfus et al., 2008).

Keywords: Brunhes-Matuyama polarity transition, chronology, sediment, oxygen isotope, ice sheet, astronomical calibration

SGL44-03 Room:421 Time:May 2 14:45-15:00

SHRIMP U-Pb zircon dating for Byakubi tephra: implication for refined chronology for the Matuyama-Brunhes boundary

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Paleomagnetic records from marine sediments have contributed to improved understanding of variations in the Earth's magnetic field and have helped to establish age models for marine sediments. However, lock-in of the paleomagnetic signal at some depth below the sediment-water interface in marine sediments through acquisition of a post-depositional remanent magnetization (PDRM) adds uncertainty to synchronization of marine sedimentary records (e.g., Roberts and 2004; Suganuma et al., 2011; Roberts et al., 2013). Recently, Suganuma et al. (2010) presents clear evidence for a downward offset of the paleointensity minimum relative to the ^{10}Be flux anomaly at the Matuyama-Brunhes (M-B) geomagnetic polarity boundary, which they interpret to result from a 16 cm PDRM lock-in depth. This indicates that a certain age offset probably occurs when a paleomagnetic record is used for dating marine sediments. This phenomenon also suggests that the accepted ages for the geomagnetic polarity boundaries, including the M-B boundary, should be revised (ca. 10 kyr younger in case of the M-B boundary). Contrary, two recently proposed revisions of the age of the ^{40}Ar/^{39}Ar Fish Canyon sanidine (FCs) standard (Kuiper et al., 2008; Renne et al., 2010) would adjust ^{40}Ar/^{39}Ar ages of the M-B boundary from Maui (Singer et al., 2005) to 781 $\pm$ 2 ka and 784 $\pm$ 2 ka, respectively.

Plio-Pleistocene marine sedimentary sequences are widely distributed in the Boso and Miura Peninsula, central Japan. Because these sequences have a significantly high sedimentation rate with well-preserved platonic and benthic foraminifera fossils, it is possible to reconstruct a detailed geomagnetic behavior along the polarity boundaries such as M-B with high resolution oxygen isotope records. In addition, a number of tephra layers are accompanied with these sedimentary sequences, which make it possible to provide absolute age constrains for the boundaries. The Byakubi tephra, located few tens of cm above the M-B boundary, has been investigated based on SHRIMP (Sensitive High Resolution Ion Microprobe) U-Pb dating of single zircon crystals from the tephra. The initial U-Th ratio is also corrected by using ICP-MS (Inductively Coupled Plasma Mass Spectrometer) analysis of volcanic glasses of the tephra. The ^{206}Pb/^{238}U ratio corrected by ^{207}Pb assuming ^{206}Pb/^{238}U-^{207}Pb/^{235}U age concordance from 20 grains are equivalent with a weighted mean of 761.1 $\pm$ 7.6 ka. Although this M?B boundary age is ~23 kyr younger than previously accepted ^{40}Ar/^{39}Ar ages, this is almost consistent with a younger ice core derived age of 770 $\pm$ 6 ka (Dreyfus et al., 2008), marine sediments age of 770 ka based on ^{10}Be anomaly (Suganuma et al., 2010), and ^{40}Ar/^{39}Ar age of 761 $\pm$ 2 ka adjusted by the K-Ar based FCs standard ages (27.5 Ma: Mochizuki et al., 2010).

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SGL44-04 Room:421 Time:May 2 15:00-15:15

Rockmagnetic and Paleomagnetic examinations for the Matuyama-Brunhes polarity transition recorded in the Kazusa Group

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We report results of rockmagnetic and paleomagnetic examinations for the Matuyama-Brunhes polarity transition recorded a marine sequence of the Kokumoto Formation, Kazusa Group in the Boso Peninsula. We have taken 130 oriented mini-cores from a 13 meters interval of sandy-siltstones spanning across the TNTT bed (Byakubi-ash layer) at the Tabuchi section along to the Yoro River and at the Yanagawa section. Results from thermal magnetic experiments suggested that the samples include iron sulfide, magnetite as a primary remanence carrier and no hematite. Measurements of magnetic hysteresis indicated that a domain state of the samples was PSD. Results of progressive alternating field demagnetization indicated a reversed to normal polarity transition boundary was observed at around 1.5 meter below the TNTT bed as well as previous studies, however the transition boundary was observed at around the TNTT bed in thermal demagnetization results. In the samples showing this discrepancy, a magnetite derived reversed polarity component was observed after a normal polarity component completely demagnetized at around 300-400 ℃. This phenomenon would be due to that the magnetite derived primary component was slightly acquired under a weak magnetic field condition just before the M-B boundary, and then chemically yielded iron sulfide magnetic minerals acquired a much stronger normal polarity component under a strong filed condition after the polarity transition. Those results exhibited that the M-B boundary situated at around the TNTT bed where about 1.5 metes above the position reported in previous studies.

Keywords: Matuyama-Brunhes boundary, rockmagnetism, paleomagnetism, L-M Pleistocene boundary, Boso Peninsula, Kazusa Group

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SGL44-05 Room:421 Time:May 2 15:15-15:30

High-resolution magnetostratigraphy across the Matuyama-Brunhes polarity transition from the Chiba Section

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An oriented 54-m core was collected from the Kokumoto Formation of the Kazusa Group, near the Chiba Section, a candidate for the GSSP of the Early-Middle Pleistocene boundary. The core spans in stratigraphy from a thick sand layer below a mud clast layer up to just below the Ku-2B tuff. A detailed Matuyama-Brunhes (MB) geomagnetic reversal record was obtained, using u-channel samples of 1 m long cut out from 1-m core section. Magnetization components were separated by stepwise alternating field demagnetization (AFD). Low field magnetic susceptibility and anhysteretic remanent magnetization show the core consists of magnetically homogeneous sediments. Magnetizations of discrete samples of 2.2cm x 2.2cm x 2.2cm were also measured, being subjected to progressive thermal demagnetizations (THD) and AFD. The declinations of characteristic remanent magnetization (ChRM) well agree across the boundary of 1m-sections, indicating that orientation of each 1m-core section was successful. Magnetic hysteresis measurements show magnetic grains are of PSD size. THD shows that hematite is included besides magnetite, a main magnetic carrier. Thermomagnetic measurements and THD suggest that the sediments include greigite, ferrimagnetic iron sulfide, which may cause a false reversal due to self-reversal of magnetic minerals. The paleomagnetic results show that the upper boundary of the MB transition lies above the Byakubi volcanic ash layer, which is much higher than the previous result. Our data show normal polarity continues from a depth of about 1m below the Byakubi, but several polarity swings exist above it. From about 70cm above the Byakubi to the top of the core, normal polarity continues. Relative paleointensity data show the lower end of the MB transition lies below the base of the core. The relative paleointensity keeps low values in the lower part below the Byakubi, and gradually increases upward above it, reaching a maximum value at about 39 m above the Byakubi. This linear increase feature is similar to the post-MB reversal intensity pattern observed in the paleointensity stack Sint-2000 (Valet et al., 2005). The low paleointensity kept throughout the basal part suggests the beginning of the MB transition lies much below the base of the core.

Keywords: Matuyama-Brunhes boundary, magnetostratigraphy, Chiba section, oriented core

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SGL44-06 Room:421 Time:May 2 15:30-15:45

Identification of Pleistocene tephra layers in marine sediment core C9001C, offshore Shimokita Peninsula, NE Japan

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Correlations for Pleistocene tephra layers in marine sediment core C9001C was investigated. The core was obtained from near the Shimokita Peninsula, Japan by the CK06-06 D/V CHIKYU Shakedown Cruise in 2006. The stratigraphy of the Hole C9001C (365 m long) has been well established based on the correlation of the benthic d18O curve with the LR04 stack (Domitsu et al., 2011). Tephra layers, a few millimeters to centimeters in thickness, can be often recognized in this sediment core that is mainly composed of dark olive-gray, diatomaceous silty clay. Two tephra layers at 30.3 mbsf and 54.3 mbsf were already correlated with the Spfa-1 and Aso-4, respectively. In this study, we focus on relatively thick and coarse tephra samples from 20 mbsf to 150 mbsf (30 - 240 ka, LR04 age). As the result, seven tephra layers were newly identified on the basis of tephro-stratigraphy and petrology, such as glass chemistry and mineralogy.

We identified the To-Of (BP1) at 19.6 mbsf, To-GP at 24.8 mbsf, Ko-i at 25.5 mbsf, Toya at 61.4 mbsf, Aso-3 at 73.9 mbsf, Mb-1 at 115.6 mbsf and Tn-C at 145.9 mbsf based on tephra databases (e.g. Okumura, 1991; Machida and Arai, 2003; Aoki and Machida, 2005). Descriptions of each tephra layer are as follows: The tephra layer at 19.6 mbsf is 6 cm thick, medium-sand sized, crystal vitric ash, including Cpx and Opx crystals. Chemical composition of glass shards is SiO2=77.5%, K2O=1.2% (100% normalized). The tephra layer at 24.6 mbsf is 3 cm thick, medium-sand sized, vitric crystal (Cpx, Opx) ash, showing Low-K glass composition (SiO2=75.4%, K2O=1.1%). The tephra at 25.5 mbsf is patchy (5 mm in maximum thickness), fine-sand sized, vitric ash, showing the Medium-K composition (SiO2=76.2%, K2O=2.1%). The tephra at 61.4 mbsf is 1.5 m thick, fine-sand sized, vitric ash, containing trace amount of Opx. Glass shards have Medium-K composition (SiO2=79.0%, K2O=2.7%). The tephra layer at 73.9 mbsf is 2 cm thick, medium-sand sized, vitric crystal (Cpx, Opx) ash, characteristically showing High-K glass composition (SiO2=70.3%, K2O=4.6%). The tephra layer at 115.6 mbsf is 4 cm thick, medium-sand sized, vitric crystal ash, characteristically including Bt, Hb crystals in addition to pyroxenes. The glass chemistry is: SiO2=78.1%, K2O=3.9%. The tephra layer at 145.9 mbsf is 20 cm thick, medium to coarse-sand sized, vitric crystal (Cpx, Opx) ash, showing relatively Low-K glass composition (SiO2=78.4%, K2O=1.5%).

We can re-examine the correlations for tephras with marine isotope stages (MIS) based on LR04 age. The To-Of tephra from Towada volcano can be newly correlated with early MIS 2 ($<$29 ka). The Aso-3 can be correlated with late MIS 6. It is also needed to revise the estimations of eruption volume and distribution of Aso-3. The Tn-C tephra from Osore volcano can be correlated with MIS 7 ($<$240 ka). Detailed identification of these seven tephras and further correlations for other tephra samples are now in progress, and will be presented elsewhere.

Keywords: Shimokita Peninsula, marine sediment core, Pleistocene, tephra, CHIKYU, glass chemistry

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SGL44-07 Room:421 Time:May 2 15:45-16:00

Overview of tephrochronological study on Kazusa Group, the standard Quaternary marine sediments, central Japan

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The author will review tephrochronological study on Kazusa Group, the standard Quaternary marine sediments, central Japan, and will point out issues to study in future. The former will be carried out by referring to previous works by each area such as Boso, Tama Hills, Yokohama, Choshi, and underground of central Kanto Plain. Recent studies have focused on description of characteristic properties of tephras and correlation between areas in Kanto district. Moreover, studies for correlation with proximal tephras around source volcanoes had been carried out.

Keywords: Kazusa Group, Tephrochronology, Quaternary sediments

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SGL44-08 Room:421 Time:May 2 16:15-16:30

The Kazusa Group as a standard tephrostratigraphy of Japanese Lower to Middle Pleistocene formations

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Tephrostratigraphy of the Pliocene to Pleistocene formations at Kyushu and Honshu Island are established (Satoguchi and Nagahashi, 2012). Establishment of stratigraphy and chronological model needs integrative interpretation of biostratigraphy, paleo-magnetostratigraphy and other stratigraphic and chronological studies. In the early stages of the work like this, decision of standard stratigraphy for is valid. Satoguchi and Nagahashi (2012) adopted the Kazusa Group as a standard formation of the Pleistocene stratigraphy of Japan.

The Kazusa Group, which is composed of marine deposits, is investigated about magnetostratigraphy, biostratigraphy, correlated with MIS and other stratigraphical studies. Many tephra beds in this group have been described, and data of characteristic properties of these tephras for correlations are accumulated (e.g. Satoguchi, 1995). Some of these tephras are examined for correlations with widespread tephras, are revealed about their volcanic source area. For example, the Ss-Pnk, the Ss-Az and the Kb-Ks tephras are from Kyushu Island (Hayashida et al., 1996; Kamata et al., 1994; Kikkawa et al., 1991). The Ho-Kd39, Eb-Fukuda, Om-SK110 tephras are from the Chubu Mountains (Nagahashi et al., 2000). The JA-O18L tephra is from north of the Kanto district (Nakamura and Arai, 1998). The As-Kd8 and the Hkd-Ku tephras are from the Tohoku district (Murata and Suzuki, 2011; Suzuki et al., 2005). The Kazusa Group contains tephras from various areas. This thing is important for being standard tephrostratigraphy. Tephras mentioned above are widespread tephras that are distributed over 500km. Some tephras in this group are revealed that they distributed relatively small area. Volcanic source of the Byakubi tephra, which is intercalated around boundary of the Lower-Middle Pleistocene, is the Older Ontake Volcano (Takeshita et al., 2005). The Ks12 tephra above the Byakubi tephra is also from the Older Ontake Volcano. These tephras are important for investigation of volcanic history about the Older Ontake Volcano. Therefore, the Kazusa Group is important formation for Japanese stratigraphic studies and investigation of explosive volcanism in the Pleistocene.

REFERENCES: Hayashida, A. et al. (1996) Quaternary International 34?36, 89?98.; Kamata, H. et al. (1994) Journal of Geological Society of Japan, 100, 848?866.; Kikkawa, K. et al. (1991) Monthly Chikyu, 13, 228?234.; Murata, M. and Suzuki, T. (2011) Daiyonki-Kenkyu, 50, 49?60. Nagahashi, Y. et al. (2005) Journal of Geological Society of Japan, 106, 51-69.; Nakamura, M. and Arai, F. (1998) Chikyu-Kagaku, 52, 153-157.; Satoguchi, Y. (1995) Journal of Geological Society of Japan, 101, 767-782.; Satoguchi,Y. & Nagahashi,Y. (2012) Island Arc, 149-169.; Suzuki, T. et al. (2005) Island Arc, 14, 666?78.; Takeshita, Y. et al. (2005) Journal of Geological Society of Japan, 111, 417-433.

Keywords: Kazusa Group, widespread tephra, Pleistocene, Byakubi tephra

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SGL44-09 Room:421 Time:May 2 16:30-16:45

Reconstruction of paleogeography of Kanto district about 1.6 Ma based on tephrostratigraphy

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First Horinouchi Tuff (HU_1) in the Oyamada Formation of the Kazusa Group, erupted about 1.63 Ma, had been found in and around Kanto Plain by previous studies. We examined the correlation of HU_1 and tephras stratigraphically near to HU_1 to reconstruct paleogeography of Kanto district in Early Pleistocene. The tephras collected from the river bed of the Tama River (Tachikawa city), the Sayama Hills, the Yokohama area, the Choshi area, Enoki Trench Core, Tachikawa Core, and Higashiyamato Core were analyzed. The tephras were correlated based on their mineral contents, refractive indices of volcanic glass shards and minerals, chemical compositions of volcanic glass shards and titanomagnetite. As a result, it was newly revealed that three tephra layers (Sayama Gomashio Volcanic Ash in Sayama Formation, pumice fall deposit in the Tachikawa Core Fujimi of Tachikawa, HY-1.1-HY1-6 in the Higashiyamato Core Narabashi of Higashiyamato) are correlated with HU_1. Also, We analyzed Tobiratoge Pyroclastic Rocks and Sanjiro Pyroclastic Rocks occured in the south part of the Utsukushigahara Plateau in order to detect the source volcano of HU_1. As a result, both Tobiratoge Pyroclastic Rocks and Sanjiro Pyroclastic Rocks are not correlated because of difference refractive indices and chemical compositions of volcanic glass shards and refractive indices of hornblende. Thus, it was revealed that HU_1 has not been erupted from the volcano vicinity of Utsukushigahara Plateau. We estimated the accumulation rates of sedimentation based on correlated tephras. The accumulation rates of sediments are 46.3 cm/kyr in the Yokohama area, 59.0 cm/kyr at Tachikawa Core, 2.5-10.3 cm/kyr at Haginaka Core, 3.8-6.7 cm/kyr in the Choshi area. These differences of the accumulation rates of sediments reflect the difference of the sedimental environment. Moreover, in Tachikawa Core and Sayama Hills, HU_1 are accumulated thicker than other areas. It is expected that HU_1had reworked again and again after its primal deposition by the effect of wave action in shallow sea.

Keywords: tephra, Kazusa Group, First Horinouchi Tuff, paleogeography

SGL44-10 Room:421 Time:May 2 16:45-17:00

Stratigraphy of the L-M Pleistocene boundary section in the Kokumoto Formation with re-definition of the Byk-TNTT tephra

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Detailed stratigraphy of the Kazusa Group was surveyed for development of water-soluble natural gas on many marker tephra in Boso peninsula (Kanehara et al.,1949; Shinada et al.,1951; Mitsunashi et al.,1959; Mitsunashi et al.,1961; Ishiwada et al.,1971; Mitsunashi et al.,1979). Magnetostratigraphy (Nakagawa et al., 1969; Niitsuma, 1976; Okada & Niitsuma, 1989), planktonic foraminifera (Oda,1977), nannofossils (Takayama,1967; Sato et al., 1988) and diatom (Cherepanova et al.,2002) were studied on the detailed stratigraphy for international correlation.

The Early-Middle Pleistocene boundary is in the middle part of the Kokumoto Formation in Kazusa Group (Kumai, 1996). Many marker tephra are interbeded in Kiwada F., Otadai F., Umegase F. and Kakinokidai F. Only 5 marker tephra are intercalated in Kokumoto F. Over twenty thin tephra, pumice bed, scoria bed and vitric fine tuff were fined out in the middle silty part of the Kokumoto F. for detailed stratigraphy around the Early-Middle Pleistocene boundary in Yoro river route, type route of the Kazusa G. (WQSB, 1996). Byakubi(Byk) tephra, 1-3cm thick vitric fine tuff under 27m thick from Ku2 distribute in Byakubi district along Yoro river. Matuyama?Brunhes magnetic reversal was fined out in the middle silty part under Ku2 tephra (Nakagawa et al.,1969). Aida(1997) showed that the magnetic reversal distribute just below the Byk tephra. TNTT tephra and the Matuyama?Brunhes magnetic reversal just below the TNTT tephra were fined under Ku2 on Yanagawa route (Niitsuma,1976). Same tephra and the magnetic reversal were fined on Heizo rute and Chonan route (Okada & Niitsuma, 1989). White vitric tephra are interbeded often in the Kazusa G. So marker tephra is necessary tephra association with over 2 tephra. 4 tephra, 3 scoria bed and 1 vitric fine tuff, were fine out just above Byk tephra on Yoro river route for detailed stratigraphy around the magnetic reversal by this study. And same tephra association were recognized just above the TNTT tephra in Yanagawa route, too.

Byk tephra zone is defined as follows. Byk tephra zone is composed of 5 tephra which in ascending order are Byk-E, Byk-D, Byk-C, Byk-B and Byk-A. Byk-B, Byk-C and Byk-D are medium sand grain scoria lenticular beds. Byk-A is 9 cm thick reddish gray vitric fine tuff. Byk-E is 1-3cm thick white vitric fine tuff. Byk-E tephra is correlated with TNTT tephra.

Keywords: L-M Pleistocene boundary, Kokumoto Formation, Kazusa Group, Byakubi tephra, TNTT tephra, Byk tephra zone

SGL44-11 Room:421 Time:May 2 17:00-17:15

Lower - Middle Pleistocene Boundary at Chiba Section and istribution situation of Byakubi Ash, central Japan

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The Byakubi Ash is distributed over the Ichihara City southern part and is located in the vicinity of a base of the middle-upper member of Kokumoto formation, Kazusa Group. Kokumoto formation is sorted four member by facies, is upper member (sandy alternation), middle-upper member (mussive mud), middle-lower member (sandy alternation) , and lower member (mussive mud). The Matsuyama / Brunhes chron boundary as the Lower - Middle Pleistocene Boundary is attracted by the lower base of the Byakubi Ash, it was confirmed that the Byakubi Ash was distributed from the Yoro River(Tabuchi) , Tabuchi River(Tabuchi), Nishi River(Tsukide), to the Koshikiya River (Koshikiya).

The future follow-up survey comes to need a careful survey, but it is thought that it is to the important clue of the chase because the distribution situation of Ku2(Ku2B' and Ku2B) inserted between the high rank of the Buakubi Ash is considerably confirmed.

Keywords: Byakubi Ash, Kokumoto Formation middle-upper member, Yoro River, Chiba Section

SGL44-12 Room:421 Time:May 2 17:15-17:30

Tephras of the Kokumoto Formation in the Mobara area

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Authors are examining the tephra stratigraphy of the Kazusa Group as part of the geologic map investigation in 1/50,000 Mobara district. The tephras of Ku0.6-Ku6E were confirmed from the Kokumoto Formation. The TNTT tephra (Niitsuma, 1971) which is just above the B/M boundary is pursued to Obota, Chonan town by Okada and Niitsuma (1989). The TNTT is a fine vitric volcanic ash with abundant hornblende (n_2=1.680-1.703) and the pumice type volcanic glass (n=1.505-1.510). This tephra was correlated with the tephras from the Older Ontake Volcano (Takeshita et al., 2005). The distribution of the TNTT was confirmed to Baba, Mutsuzawa town in the authors' investigations. Tephras of Ku0.6, Ku0.9 and Ku2.5 were confirmed in Terasaki, Mobara city where is the northeast limit of distribution of the Kokumoto Formation. The TNTT and the B/M boundary horizon are able to trace to this region.

Keywords: tephra, stratigraphy, TNTT

SGL44-13 Room:421 Time:May 2 17:30-17:45

The source volcano and age of the Byakubi tephra in the Kazusa Group in Boso Peninsula, central Japan

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Introdution

The Kazusa Group in the Boso Peninsula, central Japan is composed of Lower- Middle Pleistocene marine sediments that contain numerous tephra layers (Mitsunashi et al.1959; Machida et al. 1980; Satoguchi 1995; Satoguchi 1996 and so on). One of numerous tephra layers, Byakubi tephra (BYK; Takeshita et al. 2005) is intercalated just above Brunhes/ Matuyama (B/M) boundary in middle part of the Kokumoto Formation (Okada and Niitsuma 1989; Aida et al. 1996). BYK was correlated with YUT4 or 5 from the Older Ontake Volcano, which provide a datum plane of the Lower-Middle Pleistocene boundary in central Japan (Takeshita et al. 2005).

Correlation of the tephra beds in the Kazusa Group with those from the Older Ontake Volcano

Heavy mineral assemblage and chemical compositions of hornblende of nine Lower-Middle Pleistocene tephra beds (Ku6E, Ku5C, BYK, Ka2.4A, Ka2.4B, Ch3, Ch1.5, Ks18, Ks12) from the Kazusa Group, in Boso Peninsula were examined in order to correlate with the tephra from the Older Ontake Volcano in central Japan by Takeshita et al. (2005). Conclusively, hornblende compositions from the nine tephra beds were distinguishable. Two of the nine beds, BYK and Ks12 tephra, were correlated with two tephras from the Older Ontake Volcano, YUT4 or 5 and KZT, respectively . The age of these tephra beds of the Kazusa Group could be inferred from the stratigraphic relationships with 47 dated lava flows on the foot of the Older Ontake Volcano, and from presence of well-known widespread tephras and magnetostratigraphy in the Boso Peninsula. Correlated these two tephra beds became valuable marker tephra for geochronological studies in inland and marine sediments from central Japan. It was also emphasized that the BYK and YUT4 or 5 could provide a datum plane of the Lower-Middle Pleistocene boundary in this region.

Keywords: Lower-Middle Pleistocene Boundary GSSP, Kazusa Group, Byakubi tephra, Ontake Volcano, Bosu Peninsula