論　文　要　旨 Dissertation Abstract

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専攻 Major 環境生命学		学籍番号 Student ID 09TA004	氏　　名 Name 楠　稚枝 Chie KUSU
論文題目 Dissertation Title	横浜市南部に露出する上総層群中部の Olduvai 正磁極亜帯上限周辺における古地磁気と岩石磁気特性 Paleomagnetic and rock-magnetic properties around the upper boundary of the Olduvai subchronozone of the middle Kazusa Group exposed at the southern Yokohama City, central Japan		

Detailed lithologic, paleomagnetic and rock-magnetic studies around the upper boundary of the Olduvai subchronozone were carried out on the basis of two on-land sediment cores recovered at the southern Yokohama City, northern Miura Peninsula, Pacific side of central Japan. Around the core sites, the Nojima and Ofuna formations of the middle Kazusa Group (Lower Pleistocene forearc basin fill) are exposed. The Nojima Formation mainly consists of muddy sandstone, sandy mudstone and alternating beds of sandy mudstone and mudstone, partly intercalated slump and slump scar fill deposits. Ofuna Formation consists of massive mudstone. The two cores, named “Core I” and “Core M”, cover the lowermost part of the Ofuna Formation (0.8–6.0 m of Core I; 1.0–20.5 m of Core M) and the upper part of the Nojima Formation (6.0–105.0 m of Core I; 20.5–106.7 m of Core M). Magnetic measurements were performed in 65.0–105.0 m of Core I (a total of 479 samples) and 2.9–106.7 m of Core M (a total of 1412 samples), respectively.

The section of the Nojima Formation of Core I is divided into three segments on the basis of lithologic, sedimentologic, and magnetic characteristics. Horizon A (73.2–105.0 m) consists of mudstone and sandy mudstone. Horizon B (38.5–73.2 m) consists of a coarsening-upward sequence from mudstone to conglomeratic sandstone. Horizon C (6.0–38.5 m) consists of a fining-upward sequence from medium-grained sandstone to alternating beds of sandy mudstone and mudstone. The section of the Nojima Formation of Core M consists of mudstone upper and sandy mudstone lower.

Horizon B of Core I is interpreted as slump deposits for the following reasons: (i) the beds have greatly variable dips (16–62°) in 39−60 m; (ii) the anisotropy of magnetic susceptibility and paleomagnetic inclination data in 65.12–73.11 m indicate that the sediments suffered deformation; and (iii) the magnetic discontinuity surfaces interpreted as slump scars are detected in the horizons of 70.85–71.24 m and 73.11–73.37 m, respectively. In Core M, no slump structure is recognized by visual observation, but the anisotropy of magnetic susceptibility data suggest that about 30% of the samples taken from the horizon of 19.70–23.40 m, approximately the same horizon as the slump deposits observed in Core I, would not retain the primary sedimentary fabrics, whereas the effects are not observed in the paleomagnetic inclination data in this stratigraphic interval.

In the Boso Peninsula, some previous studies have shown that the upper boundary of the

Olduvai subchronozone is the only polarity reversal from normal to reverse polarity recognized between Kd39 tuff bed and nannofossil datum 13 (last occurrence datum of *Discoaster brouweri*). The YH02 tuff bed correlated with Kd39 tuff bed is intercalated in 26.83−27.03 m of Core I and 14.41−14.46 m of Core M, respectively, and nannofossil datum 13 is observed below the bottom of the both cores.

Large-scale paleomagnetic inclination fluctuations in associated with the upper boundary of the Olduvai subchronozone were recorded between 84.64 and 86.77 m of Core I and between 64.40 and 66.75 m of Core M, respectively. Rock-magnetic experiments and the anisotropy of magnetic susceptibility indicate that the samples in the vicinity of the polarity reversal boundary are magnetically homogeneous and have primary sedimentary fabrics. Therefore the large-scale paleomagnetic inclination fluctuations are not due to rock-magnetic and/or sedimentary causes. Inclination variations of both cores are in very good agreement, which indicates that the paleomagnetic records are reliable. A paleomagnetic polarity transition zone is defined as follows: the start of the transition zone is the horizon at which the paleomagnetic inclination exceed the circular standard deviation of the mean full normal polarity inclinations, and the end of the transition zone is the horizon at which paleomagnetic inclinations stabilized within the circular standard deviation of the mean full reverse polarity inclinations. Based on the results of Core M obtained nearly continuous data, the paleomagnetic polarity transition zone was determined as the horizons between 61.46 and 67.04 m, and the polarity reversal was determined as the horizons between 64.37 and 67.04 m, these horizons were dated to 1777.1 and 1784.5 ka, and 1780.9 and 1784.5 ka, respectively, from an age model based on oxygen isotope fluctuations of the planktonic foraminifer *Globorotalia inflata* extracted from the both cores.

Relative paleointensity, which is defined as natural remanent magnetization intensity values normalized by anhysteretic remanent magnetization intensity values, rapidly decreased before the beginning of large-scale paleomagnetic inclination fluctuations, and gradually increased after the end of large-scale fluctuations. Directional change associated with the polarity reversal occurs in relative paleointensity minimum. It is estimated that the change of paleomagnetic direction and the decrease in paleointensity are related.

The paleomagnetic record of the upper Olduvai polarity reversal obtained from Core M is similar to the record of the same polarity reversal obtained from ODP Site 983, suggesting that the dipole component of the geomagnetic field might still dominate during the polarity transition at the upper boundary of the Olduvai subchronozone.

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４０００字以内 (Within 4000 words in Japanese, and 2000 words in English)