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Data

Analyzing Data of Clay Layer of Core MDG-OWK 12 Collected at Oiwake in Mt. Tateyama, Central Japan

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立山追分で採取したコアMDG-OWK 12の粘土層の分析データ

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1. Introduction

The author collected the core MDG-OWK 12 vertically in three pieces at Oiwake in Mt. Tateyama in 2012 to investigate the aeolian dust that is presumed to be stored in peat. For the upper core (plant layer and peat only) and the middle core (peat-to-clay transition layer), measure the amount of organic matter, inorganic matter, and the number of particles from 1.5 μm to 150 μm for each 2.5 mm of sample length (Honoki, 2018). In this report, the amount of organic matter, the amount of inorganic matter, and the number of particles were measured for the remaining third core (length 27 cm, all clay layer) every 5 mm in thickness. The supplementary data (Table S1) is available from <https://doi.org/10.6084/m9.figshare.14386211>.

2. Materials and methods

After dividing the core into two pieces in the vertical direction, one of them was cut every 5 mm to make 54 pieces. A cork polar with an inner diameter of 4 mm was pierced so as to penetrate from the surface to the bottom of each fragment, and a sample for analysis (diameter 4 mm \times length 5 mm) was collected. A container made of aluminum foil (about

5 cm in diameter) was strongly heat-treated at 550 $^{\circ}\text{C}$ for 1 hour. After repeating this process twice, the weight was measured to the unit of 0.01 mg with a precision balance. A sample for analysis was placed in this container, dried at 110 $^{\circ}\text{C}$ for 2 hours, and weighed (in units of 0.01 mg). Next, the sample was heated at 550 $^{\circ}\text{C}$ for 1 hour and weighed.

Put the sample after high heat in a beaker, crush the lump with a spatula, add about 200 g of water without particles (measured to the unit of 0.1 g), treat with a sonic cleaner for 5 minutes, and separate the particles. The suspension was collected with a whole pipette with vigorous stirring and diluted with particle-free water. The number concentration of particles in this diluted solution was measured for each of the following particle size ranges with an in-liquid fine particle meter (HIAC 9703+D).

There are 16 ranges of 1.5 to 2.0 μm , 2.0 to 2.5 μm , 2.5 to 3.0 μm , 3.0 to 4.0 μm , 4.0 to 5.0 μm , 5.0 to 6.0 μm , 6.0 to 8.0 μm , 8.0 to 10 μm , 10 to 20 μm , 20 to 30 μm , 30 to 40 μm , 40 to 50 μm , 50 to 60 μm , 60 to 80 μm , 80 to 100 μm , and 100 to 150 μm .

The inner diameter of the sampling opening of the core sampler (Daiki DIK-110C) used for sampling was 46 mm, but the core of the clay layer shrank to 42 mm in diameter due to drying. However, there was no change in core length. The measured values were corrected for diameter shrinkage (core cross-sectional area at the time of sampling: core cross-sectional area after shrinkage = 1.2: 1).

3. Results

The measurement results are shown in Table S1. Figure 1 and 2 show graphs of the amount of organic matter, the amount of inorganic matter, and the total number of particles, which are a series of the previously reported data and the measured values reported this time.

In this graph, the sizes of all the measurement samples were converted into numerical values when the sizes were adjusted to a diameter of 4 mm and a length of 5 mm, and plotted.

In the previous report, the gap between the upper core and the middle core was set to 10 mm due to the disorder of the end face of each core. The gap between

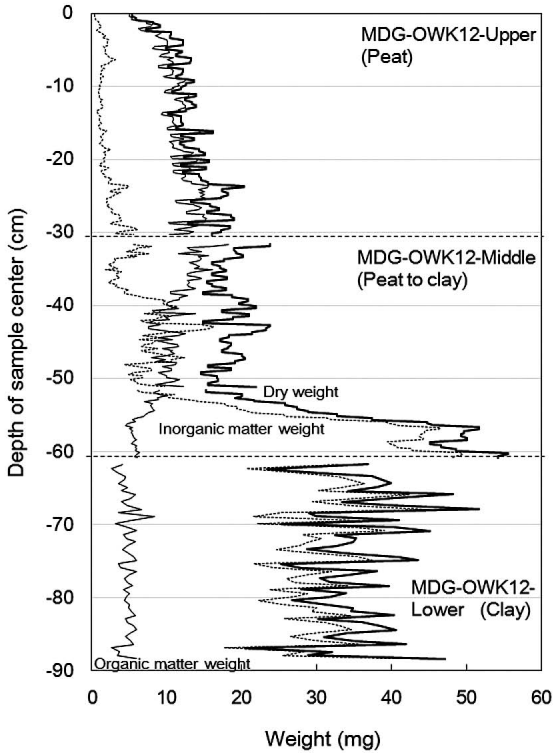


Fig.1 Dry weight, organic matter weight, and inorganic matter weight when the measurement sample of the peat core MDG-OWK 12 has a diameter of 4 mm and a length of 5 mm.

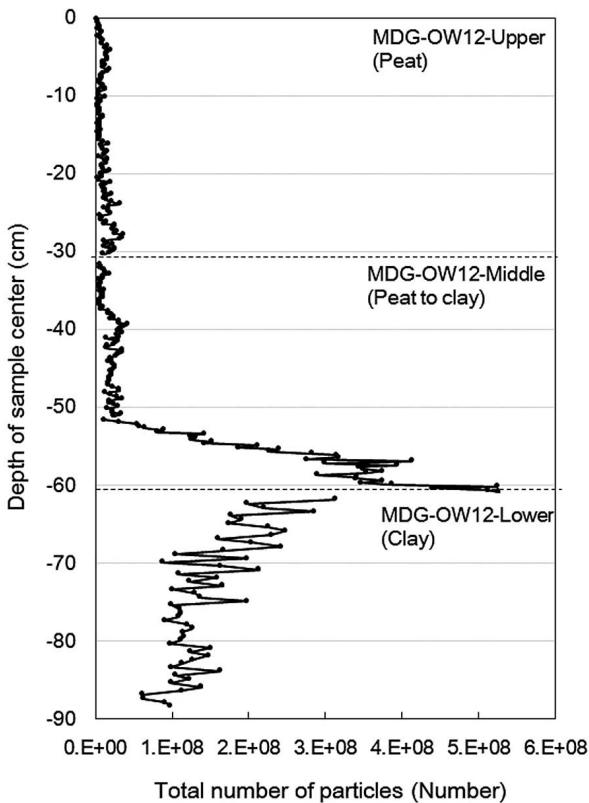


Fig.2 Total number of particles when the measurement sample of the peat core MDG-OWK 12 has a diameter of 4 mm and a length of 5 mm.

the middle core and the lower core reported in this report was set to 5 mm. In the peat layer, the sample weight was light and most of them were organic substances, but in the clay layer, the sample weight was heavy and most of them were inorganic substances. In the layer transitioning from the peat layer to the clay layer, the amount of organic matter and the amount of inorganic matter were similar. In addition, almost constant weight of organic matter was also present in the clay layer (Fig. 1).

The sample weight of the bottom layer of MDG-OWK 12-Middle was the heaviest, and the total number of particles was also the largest.

4. Discussion

The under core of the MDG-OWK 12 is a clay-only layer. The weight of each measurement sample (diameter 4 mm × length 5 mm) varied significantly from 20 to 52 mg, and the change depended on the weight change of the inorganic substance (Fig. 1). In addition, this core contained a certain amount of organic matter in all layers (Fig. 1), and 9 to 17% of the dry weight of the sample was organic matter. In addition, the distribution of the number of particles by particle size (Table S1) was very similar to the distribution of the number of particles by particle size in precipitation (Honoki and Watanabe, 2015). From this, it was considered that this clay layer was not formed by weathering of the basement rock, but was formed by the deposition of aeolian dust. The organic matter in the sample was considered to be a decomposition product of some plant growing on the accumulated aeolian dust.

5. References

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