

Lithostratigraphy of marine sediments responding to paleo-depositional conditions during the late Quaternary: Ulleung Basin, East Sea (Sea of Japan)

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Abstract

The main objective of this research is to understand paleo-depositional environments from the petrophysical and biogeochemical properties of sediments in the Ulleung Basin during the late Quaternary. Geophysical and geochemical characteristics, such as magnetic susceptibility, grain-size distribution, sedimentary facies, mineralogical content, and distribution of elemental compositions, are extensively used to interpret paleo-depositional environments. Biotic properties, which are linked with depositional conditions and redox conditions, are also useful for understanding paleo-depositional environments. These biotic properties were displayed with microbial diversity and phylogenetic tree. The phylogenetic tree showed that the other bacterial species found in each period displayed unique groupings, implying different depositional environments for specific microbial habitats. Therefore, this research investigates the depositional conditions of sedimentary facies by comparing microbial diversities with petrophysical and biogeochemical properties of marine sediments. This biogeochemical approach can contribute to a broaden understanding of paleo-depositional environments.

Key words: paleo-depositional conditions, geophysical and geochemical properties, microbial diversity