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Depositional environment of Miocene sedimentary basin distributed around Hitachiomiya area, northern Ibaraki, NE Japan

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Around the Tanakura Tectonic Line, northeast of Honshu Arc, lie Miocene terrigenous-subaqueous volcaniclastic sediments. These sediments are key in understanding the tectonics and the evolution of the northeast of Honshu arc during the Miocene, which corresponds to the opening of the Sea of Japan. Previous work conducted on the Mid Miocene succession around Hitachiomiya basin focus mainly on the paleontology or biostratigraphy of the succession. The past paleontological and paleoecological studies suggest a tropic-sub tropic environment for the deposition of the sediments based on the flora and fauna observed (e.g., Akutsu, 1952; Takahashi, 2001; Noda, 2001).

This investigation targeted the Tamagawa Formation within the Hitachiomiya basin deposits. The formation is up to 1000 m thick and is comprised of alternating tuffaceous fine sand stone and siltstone with several pyroclastic flow deposits. In this study, three characteristic facies are recognised. We interpret that two transgression-regression cycles occurred during the Mid Miocene based on detailed field observation and facies analysis on the deposits, and reconstruction of paleoenvironmental and paleoclimatic conditions. Our interpretation of two transgression-regression cycles is consistent with results from former studies focusing on other sedimentary basins around the Tanakura tectonic line.

Keywords: Tanakura basin, Miocene, facies analysis, pyroclastic flow deposits