

Depositional environment of mudstones interlayered with the Cretaceous volcanoclastic rocks in the Yanahara district, Okayama Prefecture, SW Japan

*Nobuyo Ishikawa¹, Masataka Ujiie¹, Hiroaki Komuro¹, Yoshikazu Sampei¹

1. Interdisciplinary Faculty of Science and Engineering, Shimane University

Cretaceous volcanoclastic rocks and related intrusive rocks in this district feature a cauldron, measuring 20x7km² in size. The volcanoclastic rocks consist mainly of welded to non-welded rhyolitic pyroclastic rocks 1700m+ thick, containing intercalated mudstone beds (100m thick) at the lower part. This mudstone is lacustrine sediment characterized by continuous parallel laminations several millimeters thick and normal grading. It suggests a temporal caldera lake during the intra-caldera ignimbrite accumulation.

CHNS analyses for this mudstone reveal the following results: Total nitrogen content is less than 0.1% (0.087 –0.089%); Total organic carbon content is less than 1.0% (0.33 –0.38%); C/N ratio is small (3.8 –4.3); No sulfur content is detected in. These results suggest that organic matter contents of this mudstone were derived not from forests surrounding the caldera lake but from planktonic origin in the lake water, though minor nutrient salts were probably fed.

The mudstone is the caldera infill, but nevertheless includes no sulfur content derived mainly from volcanic activity. This suggests the hiatus of the volcanic activity during the deposition of the mudstone. The environment of the caldera lake is characterized by no eruption and lesser planktonic inhabitant in the poor nutrient salts water. The total thickness of mudstone divided by each lamina thickness gives an estimate of several tens of thousand years for the depositional period. A drainage area of this caldera was not so large, but rather the narrow zone restricted just inside of the caldera rim.

Keywords: mudstone, CHNS analyses, caldera lake deposits