

## Problems on the Neoproterozoic glaciation: The 2001-2002 geolocial survey in Namibia for testing the snowball Earth hypothesis

# Shin-ichi Kawakami[1], Susumu Nohda[2], Terufumi Ohno[3]

[1] Fac. Educ. Gifu Univ., [2] Envi.Sci., Kumamoto Univ., [3] The Kyoto Univ. Museum

<http://chigaku.ed.gifu-u.ac.jp/chigakuhp/>

The worldwide distribution of diamictites in Neoproterozoic era has suggested that Neoproterozoic climate was the most severe in Earth history. Paleomagnetic studies of glacial sediments have indicated that ice sheet covered even tropical areas. Further deposition of banded iron-formations within diamictites and pair-association of diamictites and overlaying cap carbonates have been regarded as enigmatic events occurring within the cold climates. The snowball hypothesis proposed by Hoffman et al. (1998) has postulated that these enigmatic features can be explained by the novel hypothesis in a unified way. Since then, a lot of researches have been performed in order to test the idea of Snowball Earth. The authors visited Kaokoland, Namibia in 1997 and sampled a lowermost 15m sequence of Rasthof cap carbonates. This sequence is characterized by the lower most 1m of dolomites and calcite-dolomite cycles with ~1m thickness.

During our 2001 survey, slump-induced deformation structures involving the calcite-dolomite cycles was discovered. This sedimentary structures suggested that the calcite-dolomite cycles has existed as authigenic sedimentary structure before the carbonate sediments has consolidated. Further, we examined correlations of calcite-dolomite cycles for many outcrops and confirmed that the cycles can be correlated over 10km distances. The geolocial survey in the same year has revealed that the lowermost sequence of Maieberg cap carbonate has well defined unconformity with lower carbonate rhythmites and upper carbonates with gas-escape textures. The structural analysis of these features has been mapped. In the 2002 survey, we also visited several outcrops of Nama Group and collected many Ediacaran-type fossils and trace fossils. In addition, a few samples of the Otujosundu Mn deposits has been provided from the Purity Manganese (PTY) Ltd. These samples should be important materials for researches to test the Snowball Earth.