

3.2 Ga Banded Iron Formation of the Barberton belt, South Africa -lithology and sedimentary environment-

Shoichi Kiyokawa[1]; Takashi ITO[2]; Kosei E. Yamaguchi[3]; Yusuke Inamoto[4]; Minoru Ikehara[5]; Fumio Kitajima[6]

[1] Earth & Planetary Sci., Kyushu Univ.; [2] Fac. Education, Ibaraki Univ.; [3] JAMSTEC and NASA Astrobiology Institute; [4] Earth and Planetary sci.,Kyushu Univ.; [5] Center Adv. Marine Core Res., Kochi Univ.; [6] Earth and Planetary Sci., Kyushu Univ.

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The Barberton Greenstone Belt in South Africa preserves one of the oldest and least metamorphosed volcano-sedimentary sequences. The Swaziland Supergroup, composed of the volcanics-dominated Onverwacht Group, fine-grained (chemical) sediments-dominated deep-facies Fig Tree Group, and coarse-grained sediments-dominated shallow-facies Moodies Group in ascending order, is the major geologic unit found in the Barberton Greenstone Belt.

Banded Iron Formations (BIFs) of the Fig Tree Group have long been recognized in the area; however, their origin, especially the mechanism of formation and sedimentary environments of deposition, have not been fully understood. In order to extract information on the sedimentary environments of BIFs, we conducted fieldwork for detailed mapping (1/100 scale for 350m section) and documentation (135m-long continuous section) of more than 500m-thick well-preserved BIF outcrops along the Komati River near the Makhonjwa Hill in the eastern border of the South Africa-Swaziland.

We discovered cyclic occurrences of black shale, Fe-rich layer, and chert (termed BBC sequence). Field observation suggests that such cycles are not due to tectonic deformation but due to original features during sedimentation. We counted 4193 chert layers in the 135m-long section (i.e., 31 BBC sequences per 1m). Lithological transition within a BBC sequence highlights an importance of microbiological activity forming black shales toward deposition of Fe in BIFs .