

## Lateral variation of Mesoarchean Cleaverville Iron Formation: DXCL2 drilling preliminary report 2

Shoichi Kiyokawa<sup>1\*</sup>, Takashi Ito<sup>2</sup>, Minoru Ikehara<sup>3</sup>, Kosei E. Yamaguchi<sup>4</sup>, Tetsuji Onoue<sup>5</sup>, Yusuke Suganuma<sup>5</sup>, Kenji Horie<sup>6</sup>, Shuhei Teraji<sup>1</sup>, Yuhei Aihara<sup>1</sup>

<sup>1</sup>Earth and Plant. Sci., <sup>2</sup>Ibaraki Univ., <sup>3</sup>Kochi Univ., <sup>4</sup>Toho University, <sup>5</sup>Kagoshima Univ., <sup>6</sup>National Inst. Polar Rec.

We did scientific drilling, which is called DXCL 1 and DXCL 2, at 2007 and 2011 summer and more detailed mapping and collated stratigraphy at coast line of eastern most of the Cleaverville Beach. Two coastal sites had been selected for these drilling projects; CL site (CL1, CL2 and CL3) at the Cleaverville Formation, and DX site at the upper Dixon Island Formation.

The 3.1 Ga Cleaverville Formation preserves black shale to banded iron formation (BIF) sequences; only affected by low-grade metamorphism (prehnite-pumpellyite facies) without intensive deformation (Kiyokawa et al., 2012). The Cleaverville Formation situated above of chemical-volcano sedimentary sequences, which are identified by accreted immature island arc setting. The >400m-thick Cleaverville Formation, which conformably overlays pillow basalt, contains Black chert submember and BIF submember to the top. The detailed mapping along the eastern coast of the Cleaverville Beach and observation of lateral variation in these sequences indicate that thickness of stratigraphic beds are changed within about 50 m in width. Therefore, these sedimentary sequence dose not show super deep sedimentary sequence.

In detailed lithology from the drill-core of the Cleaverville Formation, the CL1 and CL2 core samples mainly consist of the organic-rich massive black shale bed (20cm in thickness) with few cross-laminated fine volcanoclastic sandstone. The CL3 core, which is upper part of the Cleaverville Formation, preserved lithological change from black shale to Banded Iron Formation. Especially, greenish siderite rich shale preserved as about 30m thick between organic-rich black shale beds to fine laminated magnetite beds. As a result of stratigraphy, the Cleaverville iron formation formed by hydrothermal input to produced extra iron and deposit siderite BIF at the relative carbonaceous anoxic condition ocean.

Keywords: Archean, BIF, bedded chert, black shale, hydrothermal activity, Pilbara