Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

BPT022-16 会場:104 時間:5 月 24 日 17:30-17:45

南中国・三峡地域のカンブリア紀堆積層から得られたn-アルカンとイソプレノイドの安定炭素同位体比について
Stable carbon isotope ratio of n-alkanes and isoprenoids from the Cambrian section in the Three Gorge area, South China

山田 健太郎[1*], 上野 雄一郎[1], 山田桂大[2], 小宮 剛[3], 吉田 尚弘[4], 丸山 茂徳[1]
Kentaro Yamada[1*], Yuichiro Ueno[1], Keita Yamada[2], Tsuyoshi Komiya[3], Naohiro Yoshida[4], Shigenori Maruyama[1]

[1] 東工大・理工・地惑, [2] 東工大・総理・化学環境, [3] 東大・総文化, [4] 東工大・総合理工
[1]Earth & Planetary Sciences, TITech, [2]Environ. Chem. and Engr, TITech, [3]Dept. Earth Sci. & Astronomy, UT, [4]IGSSE, TITech

The Cambrian period (542 ? 488 Ma) is one of the most important intervals for the evolution of life. After the Ediacaran/Cambrian (E/C) boundary, the Cambrian-type shelly biota radiated. In the Atdabanian, almost all of modern phyla had appeared, namely Cambrian Explosion. Although it is expected that the biological evolution influenced geochemical cycle in the ocean, the detail is still ambiguous. Logan et al. (1995) used carbon isotope ratios of n-alkanes and pristine to point that carbon cycles changed around early Cambrian because of the appearance of fecal pellets, which efficiently transport organic matters from sea surface to sea floor. However, the exact timing of the change and relationship between the ratio and carbon isotope values of the biomarkers, and carbon isotope values of carbonate and organic carbon are not obvious yet because of only few analyses in the previous work.

It is important to reveal the relationship of such evolutional invention and environmental change, and the reason why. We conducted high-resolution analyses of the ratio and carbon isotope values of the biomarkers to determine the exact timing of the change and to estimate the surface environmental change.

Samples are cut out from a pristine drilling core drilled in South China. Its date is from the end of Ediacaran to Atdabanian (Ishikawa et al., 2008). n- Alkanes and isoprenoids are ubiquitously detected from samples, and their stable carbon isotope ratios are measured.

According to Logan et al. (1995), in Precambrian carbon isotope ratio of n-alkanes are higher than that of pristine, but in Cambrian their relation reversed. In this study, such change is found across Nemakit-Daldynian / Tommotian (ND/T) boundary. The carbon isotope ratios of carbonate drastically change to negative around ND/T boundary (Ishikawa et al., 2008), and they interpret the negative shift as an effect of global cooling. Such environmental change might promote mutation evolution, such as inventing fecal pellets.

キーワード: 分子化石, 炭素同位体比, カンブリア紀, 南中国
Keywords: molecular fossil, carbon isotope, Cambrian, South China