



## **Biotic response of benthic foraminifera to ~4 ka cooling event in the Nakdong River delta of the southeast Korea**

Hiroyuki Takata (1), Boo-Keun Khim (2), Daekyo Cheong (3), and Seungwon Shin (3)

(1) Pusan National University, Busan, Korea, Republic Of (yuu@pusan.ac.kr), (2) Pusan National University, Busan, Korea, Republic Of, (3) Kangwon National University, Chuncheon, Korea, Republic Of

It has been reported that the cooling event at 4 ka caused climatic deterioration in the world, which is closely associated with the decline/development of the civilizations (e.g., Kawahata et al., 2009). In particular, various climate events at about 4 ka have been reported in the East Asian margin such as the decline pattern of total sulfur content in Lake Tougou-ike (southwest Japan) (Kato et al., 2003), and the enhanced precipitation and freshwater event in northeast China (Hong et al., 2005) and South Korea (Lim et al., 2015). We investigated fossil benthic foraminiferal faunas at two borehole cores (ND-01: landward site and ND-02: seaward site) drilled at the Nakdong River delta in the southeastern coast of Korea, in order to reveal whether the paleoclimate changes across 4 ka occurred in the southeast Korea. The planktonic/total foraminiferal ratio (P/T ratio) and MDS axis 1, representing the faunal composition, show temporal decline at 4 ka at core ND-01, despite no marked change at core ND-02. In contrast, MDS axis 2, which is negatively related to the dominance of *Haynesina* sp. A (an opportunistic species in organic-rich condition of neritic environments), at core ND-01 shows positive shift across 4 ka. These biotic changes are interpreted as the increase of river water discharge with rainfalls by East Asian summer monsoon and the weakening of northwesterly winds possibly with East Asian winter monsoon. Thus, despite insufficient, benthic foraminifera in the Nakdong River delta likely experienced the paleoclimate change across 4 ka.