

Estimation of late Quaternary uplift using marine isotope stage 6 fluvial terraces, in Okuaizu and Okukinu areas, Northeast Japan

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The purpose of this study is to estimate uplift rate and mode of late Quaternary crustal movement in southern Northeast Japan Arc. A Quaternary tectonic map in inland area was published by Research Group for Quaternary Tectonic Map (1968). However, revision of the map is needed referring to recent researches of topography and strata with high reliability.

Yoshiyama and Yanagida (1995) proposed a new method for quantitative estimation of the uplift rate, based on the model in which river bed elevation is controlled by the climatic changes (Dury, 1959; Kaizuka, 1977). TT method is the most reliable method to estimate uplift rates in inland region. The value of height difference between the MIS 2 terraces and the MIS 6 terraces (called TT value) is considered to indicate uplift between MIS 2 and MIS 6 (120-130ka). Recently, a lot of studies by using this method have been carried out (such as Tajikara and Ikeda, 2005; Hataya, 2005; 2006 etc).

In this study, we estimated late Quaternary uplift using TT method in inland area where fluvial terraces controlled by climatic changes were formed and fallout MIS 6 marker tephra are available for recognizing MIS 6 terrace. MIS 6 marker tephra used in this study are the Iizuna-Kamitaru a tephra (Iz-KTa: 125-150ka: Suzuki, 2001), erupted from the Iizuna volcano, Quaternary stratovolcano of the Myoko Volcano Group, and TG (125-135ka: Suzuki et al., 2004 etc) tephra, which is probably erupted from the Sunagohara caldera. The study areas are along the Yunishi River and the upper reach of Kinu River (Okukinu Area) (fallout area of Iz-KTa tephra) and along Tadami River and near the confluence point with Agano River (Okuaizu Area) (fallout area of TG tephra).

As a result, we recognized MIS 6 fluvial terraces by MIS 6 marker tephra and MIS 2 fluvial terraces, and then we estimated uplift rates in inland area by TT method in Okukinu and Okuaizu areas. In Okukinu area, TT values are estimated to be 40 (0.33mm/yr) in Yunishi River terraces (2 points), 40-55 (0.33-0.46mm/yr) in upper reach of Kinu River terraces (3 points). In Okuaizuarea, TT value is 57 (0.48mm/yr) in Tadami River terraces.

In this study, it is proved that recognition of MIS 6 terraces with high accuracy can be performed by detailed investigation in area where MIS 6 marker tephra covered. It is thought that accumulation of case studies such as this study, using the method for quantitative estimation of uplift late suggested by Yoshiyama and Yanagida (1995), will activate studies on late Quaternary crustal movement in inland area.