Late Quaternary fluvial terraces and piracies in the Tanagura area, along the upper reaches of Kuji River, NE Japan

*Yuichi Kato[1], Takehiko Suzuki[1]

1. Graduate school of Urvan Environmental Sciences, Tokyo Metropolitan University

In the Tanagura area, the upper reaches of Kuji River and the Yashiro River (a tributary of the Abukuma River), both river basins are in contact with each other. In this area, landforms showing piracies by the Kuji River exist. Previous studies have also suggested the occurrence of capturing. However, ages of piracies have not yet been determined. For determination of ages occurring piracies, chronology of terraces was established in the Tanakura area.
In this area, three landforms showing piracies exist. Timing of occurring piracies can be divided into two. In this paper, we named three paleo-rivers captured by Kuji River, that is, Ko-Uwadai River captured in the former and Ko-Mukaihara River and Ko-Shimohabara River in the later.
Fluvial terraces formed with the base level of erosion by the Abukuma River are classified into Yashiro River High terrace (YH), ditto Middle 1 terrace (YM1), ditto Middle 2 terrace (YM2) in descending order. Those by Kuji River are classified into Kuji River High 0 terrace (KH0), ditto High 1 terrace (KH1), ditto High 2 terrace (KH2), ditto Middle 0 terrace (KM0), ditto Middle 1 terrace (KM1), ditto Middle 2 terrace (KM2), ditto Low 0 terrace (KL0), ditto Low 1 terrace (KL1) and ditto Low 2 terrace (KL2) in descending order. YH formed by Ko-Uwadai River and YM2 by Ko-Mukaihara River and Ko-Shimohabara River displays characteristic topographies that indicate piracies.
KM1 consists of terrace deposits with a thickness of 2 m was covered with a tephric loess of which thickness is 3 m. This tephric loess includes AT tephra (30 ka) just above flood loam. Therefore, it is concluded that KM1 was formed at shortly before 30 ka.
KM2 consists of terrace deposits with a thickness of ca 4 m, and tephric loess or sediment covering terrace deposits was not recognized. Terraces identified as KM2 are broadly distributed in transitional zone from mountain to major valleys, terrace gravels of KM2 are coarser and are not well sorted. This suggests KM2 gravel have been deposited under the glacial stage environment. Because glacial stage after the deposition of AT is only MIS2, KM2 gravel have been deposited in 20–15 ka.
KL1 consists of terrace deposits consisted of sub-rounded gravels with a thickness of 1–2 m. There is no tephric loess on this gravel bed. KL1 where the last stage of the Jomon Period site situated on is younger than KM2. This show that KL1 was emerged at 15 ka to 2 ka.
YH consists of terrace sediment with a thickness of 4 m and it is covered by tephric loess of 8 m in thickness. This tephric loess includes two scoria fall deposits possibly correlated to be one of Ns-Sr6 (150 ka) to Ns-Sr12 (200 ka). Considering the age of YH, that is 150–200 ka.
YM2 consists of terrace sediment with a thickness of 2–3 m. Tephric loess or this sediment was not recognized. It seems that there is no tephric loess or at most 1 m in thickness. Geology and landform of YM2 is similar to those of KM2. This show that these terraces have been formed simultaneously. Considering the emergence of YM2 with piracy by Kuji River basin, the age of YM2 is around 20–15 ka.
Then, we consider when these piracies were occurred. Considering Ko-Uwadai river, the older limit of age in capturing is the formation of YH. YH would have been dissected by valley formed in an interglacial epoch, however, there is no valley. This suggests piracy occurred in MIS6 to MIS5e (200–125 ka).
Considering Ko-Mukaihara River and Ko-Shimohabara River, the older limit of age in capturing is the formation of YM2. In addition, the younger limit is KL1 because profiles of tributaries of Kuji River formed by capturing Ko-Shimohabara River are continual to KL1. Thus, piracy probably occurred in 20–2 ka.
Both piracies were occurred in glacial stage to interglacial stage condition. In conclusion, these piracies

occurred under the influence of climate change.

Keywords: Kuji River, Yashiro River, fluvial terrace, piracy

