

Relationship between the geomorphological characteristics of tributaries and the development processes of the fluvial terrace in the upstream area of the Tama River, central Japan

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Mountain rivers run through many tributary junction points, and thus the characteristics of the tributaries affect the landform and deposits of the mainstream (Shimazu, 1990, 1991; Nogami, 2010). However, few studies have discussed the effect of tributaries on the river terrace development. This study discusses the relationship between the geomorphological characteristics of tributaries and the development processes of the fluvial terraces since the Last Glacial around the tributary junction points in the Tama River, central Japan.

In the upstream area of the Tama River, several terrace levels have been formed since the Last Glacial. The highest terrace in this area (Aoyagi terrace) is a fill-top terrace composed of valley filling deposits (Takagi, 1990). Takahashi and Sugai (2016) pointed out the possibility that the valley filling of the mainstream had almost finished before MIS 4.

Aoyagi terrace in this area is distributed discontinuously around tributary junction points, and inclines toward the direction across the mainstream valley. The slope of the present tributaries incising into the Aoyagi terrace is from 150 to 300 permil, indicating that these tributaries are debris flow tributaries (Shimazu, 1990, 1991). On the other hand, the slope of the Aoyagi terrace is from 100 to 150 permil; this slope is gentler than that of the tributaries of the present. From the above, it is interpreted that Aoyagi terraces around the junction points of tributaries were formed as alluvial cones by the debris flow from the tributaries (Larson et al. 2015) during the Last Glacial in the upper reach. During the Last Glacial, the slope of tributaries decreased along with the valley filling of the mainstream. In spite of that, the slope of the tributaries had retained to be steeper than 80 permil, therefore the tributaries had continued to supply debris flow deposits to form alluvial cones. These alluvial cones were truncated by lateral migration of the mainstream after the Last Glacial Maximum. Subsequently, the slope of the tributaries has increased because of the incision since the Post Glacial.

References

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