

Debris control significance on marine terrace formation along the northern parts of Tango Peninsular

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Marine terraces along the northern parts of Tango Peninsular, west Japan, were classified into MIS 5e (Ota, 2001) and affected by tectonic movement (Uemura, 1981). Our question was why marine terraces are developed widely only in this region in the San'in Kaigan Geo Park. Tectonic movement hypothesis was proposed by Uemura (1981). Here we propose another hypothesis: debris control.

Wider marine terraces were sometimes composed of gravel layer with hard andesitic clast as terrace deposits covering softer Miocene pumice-flow deposits as base rock. This indicates that wider abrasion platform was built under shallow marine conditions with hard andesite gravel particles as effective grinders to soft pumice-flow rock by wave actions. Then tectonic movement during glacial period uplifted abrasion platforms to higher level to be marine terraces. In this period, gravel layer played another important role as armor-coats to prevent gully erosion of soft pumice-flow rock. In this sense, different rock types transported from other places are significant for forming marine terraces, that is "Debris Control Geomorphology Concept".

We measured hardness of various type base rock and marine terrace gravel particles using EQUOTIP hardness tester (L-value) in the field and considered correlation strength between terrace widths and L-values of base-rock or ratio index of L-values (L gravel / L base-rock). The result showed higher determination coefficient ($r^2=0.81$) between terrace widths and L-value ratio indexes than one ($r^2=0.24$) between terrace widths and L-values of base rock. This means that debris control is significant to terrace formation.

This research gives a new image to formation processes of marine terraces and indicates an answer why marine terraces are developed widely only in northern parts of Tango Peninsular in the San'in Kaigan Geo Park. In conservational points of view, marine terrace deposits are important to prevent gully erosion on marine terraces. We must preserve marine terrace deposits to conserve marine terrace scenery.