Debris avalanche deposits repeatedly supplied from a rock cliff of Mt. Dotoko, western Shimane, Japan

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Occurrence of slope failure and rock fall, which are triggered by heavy rain fall, tends to repeat, and they are regarded as one step in erosion and denudation processes of mountains in geological time scale. Although such a process is continuous geologically, individual occurrences may be sudden for the people lived near the slopes, especially in the case of the occurrence with long recurrence time. Then, it is necessary to predict the probability of the occurrence of such evidences and to estimate the spatial extent of the influenced area in the future on the basis of analyses of past geological evidences.

Occurrences of large slope failures or rock slides in the past were estimated around Mt.Dotoko, which is an isolated mountain with 300 meters in elevation and is located in western Shimane, Japan, based on the configuration of the cliff and the distribution of numerous large blocks at the foot of the cliff. The mountain is composed of the Quaternary dacite lava. Its northwestern cliff is steep, whereas gentle surface extends with elevation of 100 meters at the foot. Numerous big blocks of dacite are distributed on them. Dacite composing the cliff is bounded by two vertical and one gentle joint plane. Rock mass of dacite is mostly loosed, and slightly toppled northwestward in some portions. Shallow depressed zones elongated parallel to the cliff are recognized at the top of the cliff, and this means that the cliff is partially moved outer ward.

On the other hand, large blocks are angular with smooth planes. Diameters attain 4 to 5 meters, and largest one was 11 meters. They are widely distributed at the foot of mountain, especially at the northwestern foot of the cliff with thick debris deposits. The deposits tend to appear as small topographical mounds elongated almost parallel to the cliff. Based on these evidences, large slope failures or rock slides of dacite blocks have occurred repeatedly from the northwestern cliff of Mt.Dotoko, and they have formed enormous debris deposits and large blocks at the foot of the mountain. Considering that there is no stream in northwest face of the mountain, they are considered to have moved as debris avalanche.

Wood fragments were recognized with dacite blocks in bore holes at the foot 1 kilometer far from the cliff. ^{14}C age of 1400 years ago was obtained from a wood fragment. If thin lacustrine sediments composing gentle plains have deposited in a lake dammed up by such debris avalanche deposits, one of events may be about 1400 years ago. Considering that cliff is mostly unstable even now, similar failures with debris avalanche may occur in the future.