

Occurrences of slope failures depending on old landslided blocks, in cuesta slopes of Paleogene System, Amakusa Islands, Japan

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Although occurrences of slope failures depend on shape, material, and structure of the slopes, most of slope structures are complicated. Especially, in the area, where slope failures have occurred repeatedly, old landslided deposits sometimes remain partially on the slopes, and they influence on the occurrence of new failures. As an example, slope structures of the Paleogene sandstone and mudstones have been studied, which are distributed around the Mt. Kuratake, Amakusa, Japan, where heavy rainfall disaster occurred at 1972.

Slopes around the Mt. Kuratake consist of mudstone and sandstones of the Paleogene strata with Miocene intrusive rocks, and they dip northwestward gently with homoclinal structures. This reveals as typical cuesta topography here.

Steep slopes with plunging structures in southeast side of the mountain ridge, whereas gentle slopes with slipping structures in northwest side. Slope failures and debris flows occur on both sides, and they are rather independent of litho types. Occurrence of slope failures is restricted in steep slopes of 35 to 40 degrees in southeastern side, and they are located mostly on concave heads of steep streams. On the contrary, slope failures on northwest side tend to occur on not only steep concave slopes, but also gentle convex slopes. Therefore, occurrence of the former may strongly depend on slope steepness, whereas the latter mainly translational slide controlled by stratified bedding planes, and rather independent of slope topography.

Aradaira area is one of typical examples of the latter, where old landslided deposits covers widely the slopes with slipping structures. They are partially stratified, but brachiated and soft. Slope failures and debris flow of the 1972 disaster was estimated to be removing of one portion of such old deposits. Old debris flow deposits are also distinguished from new deposits in here, and this indicates that debris flow have occurred repeatedly in these slopes of old landslided material here. Some slopes characterized by similar conditions are also recognized in the area around the Aradaira.

Considering that Amakusa is one of famous landslide areas in Japan, it may be necessary to understand the locations of old landslided deposits, and understand these mechanical relations to predict future occurrences of slope failures and debris flows.