



## **The influence of granitic rock textures on their weathering and landslide occurrence**

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We investigated the landslide densities, the weathering profiles, the mechanical properties of weathered rocks, and the rock textures for granite and granodiorite in Obara village, Aichi prefecture, where numerous landslides were induced in granite areas but not in granodiorite areas by the heavy rainstorm on July 13th 1972. Landslide density in granite area was about twenty times larger than that in granodiorite area. In addition, landslide density in granite area increased with the amounts of precipitation, while that in granodiorite area did not. The difference of landslide occurrence between these two rock types is attributable to the difference of weathering styles, which are controlled by rock textures. Newly developed rock texture analysis quantitatively indicated that the connectivity of plagioclase grains is higher in the granodiorite than in the granite. Plagioclase is weathered faster than the other felsic minerals such as quartz and potassium feldspar, and it is changed into clayey minerals, such as halloysite and kaolinite. Because highly connected frameworks of plagioclase produce a framework of clayey materials as buffering and binding materials when it is weathered, strongly weathered granodiorite gains cohesion; on the other hand, weathered granite loses cohesion because plagioclase grains are more isolated. The change in cohesion by weathering was verified by in-situ shear tests. Because weathered granite loses cohesion, the surface part of its slope easily loosens and finally slides, whereas that of granodiorite does not. Slope stability analyses indicated that weathered granite slopes are far unstable than weathered granodiorite slopes.