

Influence of lithology on production and transport of soils on hillslopes underlain by granite and hornfels

*Takuma Watakabe¹, Yuki Matsushi², Hiroyuki Matsuzaki³

1. Graduate School of Science, Kyoto University, 2. Disaster Prevention Research Institute, Kyoto University, 3. The University Museum, The University of Tokyo

We measured rates of soil production and transport using cosmogenic ^{10}Be and measured characteristics of soil properties in hillslopes underlain by granite and hornfels in Shirakawa watershed, eastern Kyoto City. Rates of soil production and transport of the granite hillslope were faster than those of the hornfels hillslope. Soil on the granite hillslope was incohesive sand with large saturated hydraulic conductivity and low water retention ability. In contrast, soil on the hornfels hillslope was cohesive sand with low saturated hydraulic conductivity and high water retention ability. Characteristics of the granite soil promote wet-dry weathering effect in the shallow subsurface materials of the granite hillslope. Thus, physical, mechanical, and hydrological properties of soils on each bedrock control the rates of soil production and transport.

Keywords: Soil production rate, Soil transport coefficient, Cosmogenic nuclides, Geotechnical properties