

# Application of Quaternary organic sediments filling landslide-induced depressions to paleoenvironmental and paleoecological studies in the Japanese Alps

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Pleistocene and Holocene paleoenvironments of the Japanese high mountains have not always been understood. This is because, appropriate deposits including macro-micro plant fossils and datum beds such as tephras are tend to be eroded on mountain slopes. Erosion rate in the Japanese high mountains is quite faster than the world average values. Under these circumstances, landslide-induced closed and semi-closed depressions on ridge-top or valley side slopes provide effective opportunities for better understanding of the Quaternary environmental changes in high mountains. Those depressions are often filled by organic-rich sediments that can be used for <sup>14</sup>C dating and bear plant fossils and tephras. The Japanese high mountains are prone to form landslide-induced depressions as high relief terrains, high precipitation, high activities of earthquake and volcanism, complex geological settings, and high uplift rate.

Here, we will demonstrate some examples of geomorphic features, distributions, and historical developments of landslide-induced depressions particularly those in the Japanese Alps in central Japan. We also show geologic and chronological evidences of organic-rich sediments in the depressions. In addition, we show a method of drilling and excavation on depressions using portable instruments. The areas introduced are Mts. Asahi-dake, Shirouma-dake, Eboshi-dake, Tsugaike Plateau, Takamagahara basin, Kamikochi Valley, and so on. We will discuss and share the efficacy and future possibility of organic-rich sediments in landslide-induced depressions for integrated studies of environmental changes in the Japanese high mountains.

Keywords: deep-seated gravitational slope deformation, landslide, Quaternary sciences, alpine-subalpine zones