

Age of the buried trees from ancient landslide-dammed lake at Toyama-River, southern Nagano Prefecture, central Japan

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Huge landslide occurred by a violent storm or a strong earthquake in most cases, and a lake is formed when it blocks a flow of stream. A landslide-dammed lake brings serious damages like a submergence of living area, besides the original damage. Data about landslide-dammed lake of factor, timing and distribution by geological survey and sample analysis about the ancient events is important to predict the disaster circumstance for the future.

Many of buried trees that stand straight found out along Toyama-River, south part of Iida city, Nagano prefecture. They remind us that landslide-dammed lake had been filled by water and its trigger is perhaps huge earthquake, because some active faults exist around this area. In the previous research, the buried time of a Japanese cypress which meant the formed time of the landslide-dammed lake was clarified 714 AD by dendrochronology. The timing of the landslide-dammed lake formation at 714 AD accorded with that of the strong shock caused by Totoumi-Jishin (huge earthquake) on ancient documents.

Our research has targeted the landslide-dammed lake formed in 714 AD. Previous research had proved that the trees were buried at 714 AD, although it was not determined the location and size of the landslide dam. In this research, we tried the geology and morphology survey for deciding the dam position, and the death ages of some buried tree samples from the dam deposit were estimated. Moreover, the buried samples found in lake sediment layer were analyzed for discussing when the landslide-dammed lake was filled. We used a carbon-14 dating method for estimating the age of these samples because it is suitable method for clarifying the timing of dam forming in using the various type and condition samples.

The samples of buried tree analyzed in this research suggested a period about 714 AD or earlier time. We suggest that the landslide happened around 714 AD because one special sample from avalanche deposit decided this age; it is thin branch about 1.5 cm in diameter. Consequently, it concludes that the avalanche deposit of the dam, which is kept on the downstream area from Japanese cypress at interval of 1 km, is associated with Totoumi-Jishin at 714 AD. Discussion about the timing of accumulating the lake sediment is difficult yet since we are looking for good samples to define the age in enough quality and quantity. We will chiefly report on the timing of the landslide and dam, together with the sample information that estimated the period.