[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-GI General Geosciences, Information Geosciences & Simulations

[M-GI25]Environmental changes in mountainous area

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Mountainous areas provide water resources to the populated downstream areas, protecting the diversity of ecosystem and providing tourism attraction. To access the mountain environment changes and mitigate the impacts of global warming influences, a cross-cutting session is proposed to share the scientific knowledge among various fields; such as climatology, hydrology, geography, glaciology, water/carbon/material cycle, eco-diversity, etc.

[MGI25-P09]Species composition of woody plant fossils buried in lacustrine sediments within dammed lakes formed by the Dondokosawa rock avalanche in the Akaishi Mountains, central Japan

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The Dondokosawa rock avalanche (DRA) initiated at east-side slope of Mount Jizo, the Akaishi Mountains of southern Japan Alps, and traveled over 3.6 km in distance along the main stream of the Dondokosawa River. The displaced mass of the DRA completely blocked two parts, the outlet of right tributary of the Dondokosawa River and the channel of the Ohdanasawa River (upper part of the Komukawa River), forming two dammed lakes besides the debris (Kariya, 2012; Kimura et al., 2018). At these two sites, a lot of woody plant fossils buried in lacustrine sediments were found by the authors. Yamada et al. (2018) applied the dendrochronological analysis using tree-ring oxygen isotope ratios to disc fragment and increment core samples collected from two individuals, and estimated death year of one individual to be around AD885 and that of the another one to be AD888. These chronological constraints on the DRA strongly indicated that the DRA have occurred at the year of AD887 Ninna (Goki-Shichido) earthquake, which was one of the gigantic ocean-trench earthquakes documented along the Suruga and Nankai Troughs off central Japan, or at a couple of years later than this earthquake.

The finding of woody plant fossils also has a significance for understanding the paleoenvironment in mountainous regions. Because deposition zones, which store microfossils, plant macrofossils, ashfalls and sediments, are usually fragile in highly-erodible mountainous regions of Japan Alps, woody plant fossils with precise death years and living periods can be valuable proxies for paeoenvronmental reconstruction. In this study, we identified total 21 samples collected from woody plant fossils found at the outcrops of lacustrine sediments within the two dammed lakes formed by the DRA, and examined characteristics of the species composition in the Akaishi Mountains at around 9th century.

The sampling sites were named the lower dammed lake and floodplain deposits (LLD) and upper dammed lake and floodplain deposits (ULD), respectively. LLD is located at the confluence of the Dondokosawa and Ohdanasawa Rivers, and has a drainage area of 8.81 km^2 with altitudes ranging from 1220 to 2760 m a.s.l.

LLD mainly consists of sandy and silty sediments of over 4 m in thickness, and contains many large (φ25-40 cm) tree trunks. ULD is located at the outlet of right tributary of the Dondokosawa River, and has a drainage area of 1.17 km^2 with altitudes ranging from 1470 to 2630 m a.s.l. ULD consists of alternated sand and silt layers of about 4-5 m in thickness, and contains middle-to-large (φ15-25 cm) tree trunks as well as small (< φ10 cm) logs and fragments.

Of the total 21 samples, the 7 samples in LLD are composed of major tree species in montane and/or subalpine zones such as Sawara cypress (*Chamaecyparis pisifera*), Hinoki cypress (*Chamaecyparis obtusa*), Birch tree (*Betula* sp.), Hemlock tree (*Tsuga* sp.) and Spruce tree (*Picea* sp.). The other 14 samples in ULD are composed not only of montane and subalpine tree species such as Fir tree (*Abies* sp.), Hemlock tree (*Tsuga* sp.) and Japanese larch (*Larix kaempferi*), but also shrub or small tree species such as Azalea tree (*Rhododendron* sp.) and Willow tree (*Salix* sp.).

According to the present vegetation around the Akaishi Mountains, two or more species are nominated for each of the above 6 genus: (1) *Betula* includes several common species in lowland and montane zones, such as *B. platyphylla* var. *japonica* and *B. maximowicziana*, and major subalpine species, *B. ermanii*, (2) *Tsuga* includes *T. sieboldii* and *T. diversifolia*, (3) *Abies* includes *A. homolepis*, *A. veitchii* and *A. mariesii*, (4) *P. jezoensis* var. *hondoensis* is the most likely candidate for *Picea* because of its abundance, while the possibility of rare species such as *P. koyamai* and *P. maximowiczii*, which are distributed only in narrow zones around Japan Alps, is still undeniable, (5) *Rhododendron* includes *R. degronianum* and *R. brachycarpum*, which are common understory species in subalpine forests, (6) *Salix* includes *S. sachalinensis* and *S. serissaefolia*, which are typical pioneer species in riparian zones.

References: Kariya (2012) Trans. Jpn. Geomorphol. Union 33, 297-313 [in Japanese with English abstract]; Kimura et al. (2018) J. Jpn. Landslide Soc. 55, 42-52 [in Japanese with English abstract]; Yamada et al. (2018) Quat. Geochr. 44, 47-54.