Eruptive history of Mt. Fuji over the past 8000 years reconstructed from proximal volcanic-dammed lake sediments

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Reliable records of past volcanic activities are of vital importance, especially for active volcanoes, to provide a time constraint on magmatic activities over a long period [1] [2]. An eruption record can be reconstructed using land-based tephrostratigraphic studies of the area near the volcano. However, not all tephra (pyroclastic fall) layers are necessarily preserved near volcanoes because of the terrestrial preservation constraints associated with erosion and soil formation. In contrast, lake sediments in volcanic regions can contain tephra layers from adjacent volcanoes, providing a unique opportunity to reconstruct continuous volcanic eruption histories[3]. In this study, we reconstructed the eruptive history of Mount Fuji, the largest active volcano in Japan, over the past 8000 years using proximal volcanic-dammed lake sediments (Lakes Yamanaka and Kawaguchi). The depositional ages of the 29 and 8 tephra layers were determined based on radiocarbon dating in sediment cores from Lake Yamanaka and Lake Kawaguchi, respectively. Comparison of the tephra layers in the core with those in the proximal land section and in the literature revealed the presence of at least six previously unknown eruptions at the north to northeastern foot of Mt. Fuji from 5050 to 3900 cal BP. We also present the morphological and geochemical characteristics of each tephra layer and explore their potential for the correlation of tephra layers between the cores from Lake Yamanaka and Lake Kawaguchi.

[1] Okuno, M. (2011) J. Geo. Soc. Japan 117, 654-662.

[2] Tsuji, T. et al. (2016), Quat. Int. 471, 278-297.

[3] Obrochta et al. (2018) Quat. Sci. Rev., 200, 395-405.