

Paleotsunami history at Minna Island, southern Ryukyus, Japan

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In Miyako Islands, many studies have been conducted on paleotsunami deposits. However, paleotsunami history is not well delineated because Holocene deposits including tsunami deposits are thin. It is known that a tsunami boulder transported by 1771 Meiwa tsunami occurs in a pasture at 7 m elevation on Minna Island, Miyako Islands (Kato, 2000 ; Goto et al., 2010). Because the boulder is large (3.8 m long, 3.1 m wide, and 2.3 m high) and heavy (about 33 tons), there seems to be no possibility that it was artificially placed. As it is well known that boulders are deposited on sandy tsunami deposits due to the differences in their moving velocity depending on the grain size (Yamada et al., 2014), sandy tsunami deposits, transported by the 1771 Meiwa and older tsunamis, were expected to be recovered immediately beneath the boulder. So we investigated the sandy deposit in the trench near the boulder in order to delineate paleotsunami history in Miyako Islands.

In this study, we discovered two event layers each composed of gravelly sand in the trench: upper Sand-A and lower Sand-B. Grain size and composition of these layers indicate that they were not formed by storm waves, but by tsunamis Sand-A and the boulder were deposited simultaneously at the 1771 Meiwa tsunami. Radiocarbon dates of a coral and a shell indicate that Sand-B was deposited by a tsunami for the last 700–800 years. This date is consistent with the dates of tsunami deposits known in Yaeyama Islands (e.g. Ando et al., 2018). Our data indicates that the tsunamis were large enough to cause serious damage to both Miyako Islands and Yaeyama Islands.

Keywords: tsunami sediment, Miyako Islands