

Fault-related geomorphic history at Misayama-godo, Fujimi Town, in the central-to-southern part of the ISTL active fault zone

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We present a fault-related geomorphic history of a tectonic bulge caused by left-lateral strike-slip faulting at Misayama-godo, Fujimi Town, Nagano Prefecture, in the central-to-southern part of the ISTL active fault zone. Northwest-trending similar fault-related bulges also exist around Misayama-godo, however, their geomorphic history has been almost unknown until now. We summarize our major results based on airphoto interpretation, surficial geologic survey, LiDAR survey, pit excavation, drilling, tephra identification, and radiocarbon dating as follows. (1) The original surface of the studied tectonic bulge was constructed by fluvial sand and gravel derived from the Akaishi Range approximately between the falls of On-Pm1 (ca. 100 ka) and On-Mt (ca. 57ka), that was followed by aeolian sedimentation after fluvial processes. (2) Detailed topographic map based on LiDAR survey shows repeating right step of each fault trace located in the bulge, steps being at intervals of several tens to hundreds meters in general. (3) A pit excavation enabled us to observe vertical and high-angle southwestward-dipping fault planes, which made the southwest strata subsided. In addition, drag structures were exposed on the pit bottom that indicated left-lateral strike-slip faulting. (4) (2) and (3) can be interpreted as a result of subsurface left-lateral strike-slip faulting on a vertical or high-angle fault plane. (5) Fault traces in the bulge continue to the northwest and cut a relatively new fan surface, although the fault traces in the northeastern and southwestern margins do not. This indicates that recent subsurface faulting mainly emerges upward but to the former traces. Actually, we identified a very recent paleoseismic faulting event that occurred between 1000+/-40 yBP and 1870+/-40 yBP in our pit, which was excavated across one of the former traces. (6) (5) supports the suggestion of Sugito et al. (2008): the former traces started to develop approximately after the fall of AT (26-29 ka) and their average slip rate is estimated to be 3.3-7.5 mm/yr in total. This study would also provide us with valuable implications for understanding the other fault-related bulges around the studied one.