

# Evolution of tafoni on steep slope of the Miocene sandstone and rock fall process in Shimane, Japan

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Tafoni, which have been formed due to salt weathering, tends to appear on steep rock slopes, and therefore it tends to bring about rock falls. Practical process of salt weathering and formation of tafoni is important to predict future rock falls. Then, topographical and geological conditions of steep slopes, where tafoni developed, and weathered condition of inner wall of tafoni have been studied in the Miocene sandstone slopes, Oda, Shimane Japan.

Field evidences show that topographical and geological conditions of slopes, where tafoni appeared, almost coincide with the previous ones (Takehara, 2000). That is, it tends to appear on steep slopes of coarse-grained sandstone with thin gravel beds with plunging structures. These tafoni observed here include both sidewall tafoni and basal tafoni. Configuration of tafoni is almost circle in small one, whereas horizontally elongated in large one. Linked structure of two or three small tafoni indicates that the linkage may be one step of horizontally elongation process.

Apparent water contents and rebound value of sandstones have been measured using handy water content meter and Schmidt rock hammer. As a result, rebound value is low in the central wall whereas high in visor and floor. Apparent water contents is high in the former whereas low in the latter.

Pore size distribution in weathered sandstones is also measured using a mercury injection type porosimeter, to obtain the change of weathered degree of the wall sandstone. Although porosity is almost same, percentage of large size pore is high near the wall and low inside the wall. This changes even in several centimeters, and means that salt weathering proceed with destroying rock textures from the wall surface toward inside.

In general, two types of cracks are pointed out in such overhanged blocks just above tafoni. One is originally existed cracks perpendicular to bedding planes, and the other is newer cracks occurred due to rotational moment of overhanging portion. We confirmed both type of cracks in there. Numerous big blocks scattered on the foot of such steep slopes indicates that a series of process from salt weathering, expanding tafoni, cracking in overhanged blocks, and rock fall has continued in this area during long time.