

Quantitative relationships between salt-weathering of tuff and microclimatic environments, in the Yoshimi Hyaku-Ana historic site, Japan

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This study monitored the temperature and relative humidity near the cave wall of the Yoshimi Hyaku-Ana, a historic site. The purpose of the study was to investigate the relationships between salt-weathering denudation of the cave wall (which is composed of tuff) and the local weathering environment. Five measuring points were established inside the cave, with differing degrees of tuff denudation. Monthly observations and measurements were made over 1 year. Small ‘button-type’ sensors (with data loggers) were attached to the cave wall to record temperature and humidity at hourly intervals. After collecting these data, the relationships between environmental condition (temperature and humidity) and the degree of denudation due to salt weathering were evaluated. The degree of denudation were larger in dry measuring point near the entrance of the cave, compared with the inner areas of the cave. This suggests that humidity is one of the major climatic conditions for salt weathering.

Keywords: Denudation, Relative humidity, Salt weathering, Tuff, Yoshimi Hyaku-Ana, Historic site