

Study on the weathering rate of tuff under different environments

Qin Fei LU

Yandangshan Global Geopark, China < E-mail: 361059978@qq.com >

Weathering and flaking depth of rock are different because of orientation and environment in Yandangshan Global Geopark. The degree of rock weathering can be shown by weathering speed. The weathering depth of decorative surface made of tuff in different orientation in the former residence of Mr. Zhang Yuanxun located in Xinheta Town, Wenling, Zhejiang Province is measured using an accurate instrument. The average flaking depth of 9 tuff stone in 5 measuring areas ranges from 1.56 to 6.86 mm and the maximum weathering depth varies from 3.48 to 20.49 mm. Therefore, the calculated average and maximum weathering velocity is 0.003594 ~ 0.015806 mm/a and 0.008018 ~ 0.047212 mm/a respectively. It is found that the rock weathering velocity towards west is highest and facing south is lowest. For example, we can have a discussion about the slates of tuff which could be found in Zhangyuanxun's former home, No.122 in Dongmen street of Xinheta town in Wenling city, Zhejiang province. Research on differences between orientations and speed, depth of weathering has been done, then we estimated the average speed of weathering during a period of 434 years on slates which were used for building. Based on field investigate, the 9 tuff slates which we prepare to do study on relationship between their weathering speed and environment are all got from the famous ancient underground quarry which was called Changyudongtian in Wenling. Research of petrology and mineralogy also show that the above 9 slates belong to the same properties, and they have no difference in mineral consist and structure, what's more, they maybe from the same stratum and the locations could be very closed. By observing we can find that different area of measurement have obvious differences in depth of weathering. The contour lines of each area reflect the level relationship of weathering: if the contour lines were sparse, the level of weathering could be small; otherwise, the level could be large. Considering the different aspects on temperature, humidity, illumination, ultraviolet radiation intensity and obscured conditions, the weathering velocity difference of the stone is caused by different environment.

Key words: different orientation; tuff slab; depth of weathering; rate of weatheringgeopark Yandangshan.