

重大工程实践

微环境对龙游石窟粉砂岩风化的影响

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摘要:

本文通过龙游石窟2号洞离洞口较近的洞内围岩的风化程度比离洞口较远的洞内围岩的风化程度更为严重的事实来论证微环境对粉砂岩风化的影响。为了描述围岩风化的严重程度,利用橡皮泥压模法对龙游石窟2号洞洞口附近围岩和洞内围岩的凿痕深度进行了量测。量测结果表明,洞内围岩凿痕的最大高差和最大起伏度的平均值分别为10.2mm和0.43。与之相比,洞口附近围岩凿痕的相应值都较小,分别为8.0mm和0.35。以上数据说明洞口围岩凿痕的风化深度较大,粗糙程度较小,被“磨平”的趋势更严重。作者认为,2号洞洞口附近和洞内的微环境差异(主要包括降水、温度、光照和苔藓等)造成了上述围岩风化程度的差异。

关键词: 微环境 地下洞室 风化程度 风化深度 粉砂岩

INFLUENCE OF MICRO-ENVIRONMENT TO PELITIC SILTSTONE AS SURROUNDING ROCK OF LONGYOU UNDERGROUND CAVERNS

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Abstract:

Five complete caverns were un-watered and discovered in Longyou in June 1992. They were manually caved in siltstone at shallow depths more than 2000 years ago. As time goes on, weathering of the surrounding rock of the caverns is increasing severely. The fact that the weathering degree of the surrounding rock nearby the entrance of the No.2 cavern is more serious than that inside the No.2 cavern are explained with the weathering difference of the pelitic siltstone due the difference in the micro-environments. The depths of the chisel marks of the surrounding rock nearby the entrance and inside the cavern No.2 were measured using plasticene. The corresponding curves of chisel mark depths were obtained. According to the measured results, the mean values of the maximum high recession and the maximum fluctuation ratio of the chisel marks inside the cavern is 10.2 mm and 0.43 respectively. The corresponding values of the chisel mark nearby the entrance are smaller. Their mean values are 8.0 mm and 0.35 respectively. The above values indicate that the weathering degree of chisel marks nearby the entrance are larger than that inside the cavern. It is believed that the above difference in the weathering degree is caused by different weathering micro-environments which mainly include rain, temperature, illumination intensity and lichen in the surrounding rock nearby the entrance and inside the cavern.

Keywords: Microenvironment Underground cavern Weathering degree Weathering depth Pelitic siltstone Moss

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