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## Effects of paleosol on collapsibility of loess sites under immersion test conditions

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The presence of multiple layers of red paleosol in loess strata poses challenges due to its high hardness, which hinders easy collapse when encountering water. This characteristic significantly affects the measurement results of the collapsible amount of loess strata. However, there is currently a lack of reports on the control effect of paleosol on collapsibility, resulting in a deficiency in the theoretical basis for the scientific selection of collapsibility in these strata. This paper aims to address this gap by analyzing the differences in self-weight collapsibility between indoor and outdoor conditions under various paleosol layers in different areas and strata. The analysis is based on statistical results from immersion tests conducted in the Loess Plateau. Furthermore, the research focuses on two test sites in Xi'an and conducts large-scale immersion tests, considering measurements such as water diffusion, changes in water content, soil pressure, and cumulative collapsibility under different test conditions. The study investigates the influence of paleosol layers on water infiltration and their role in controlling total weight collapse. The final results indicate that the presence of a paleosol layer prevents collapsibility from transferring to the lower layer and inhibits water infiltration, thereby reducing total collapsibility. Discrepancies between measured and calculated collapsibility values are positively correlated with the number of ancient soil layers. This research provides valuable insights into the collapsibility mechanism of paleosol-loess strata.