



Using OSL to decipher past soil history in archaeological terraces, Judea Highlands, Israel

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Archaeological terraces are the most prominent feature of the agricultural sphere in the hilly landscape throughout the Mediterranean. Using terrace walls for the artificial creation of arable plots of land was a major technological innovation that has completely altered the natural terrain. As such, the dating of these simply built features is of upmost importance.

Archaeological excavations and OSL dating of the soil infill of terraces were carried out in three excavation areas at Mt. Eitan in the Judea Highlands, Israel. Previous survey showed that Mt. Eitan was settled continuously at least from the Middle Bronze Age (ca 3800 years ago) and until modern times. The OSL ages shows that all extant terraces were constructed in the past 550-200 years, in the Ottoman period. Older ages are limited only to the base of a few terraces, and they range from the Roman Period (ca 1800 years ago) to Mamluk times (ca 700 years ago). Many of the soil samples contain quartz grains with older ages, indicating incomplete bleaching of the sediment at the time of terrace construction. We used the finite mixture model to find out if there are distinct age clusters to these poorly bleached grains. Analyses were carried out on a compilation of all measured De values (small aliquots) from the entire study area, and for each area separately. Results show that the unbleached grains cluster into only a few periods and highlight four synchronous episodes of terrace building in the past 800 years. The Roman and Early Islamic periods are also represented, even in area where soils with such ages were not found. The unbleached grains preserve older episodes of terrace building no longer represented in the landscape.