

An integrative approach to assess the reliability of AMS dates for terrace construction: FTIR, soil micromorphology and terrace clustering

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Terraced landscapes of ancient origin are widely spread along the Mediterranean in island, coastline and continental environments. Overall, they reflect a long-term social struggle for the creation of flattened, deep cropping surfaces that reduce erosion, increase water retention and facilitate the cultivation of slopes. Archaeologists, anthropologists and historians have shown a major interest in determining the chronology of such landscapes, generally according that ¹⁴C dating of the topmost horizon of soils buried under terrace fills is the most reliable way to do so. Although the factors jeopardising the preservation of buried soils -and therefore undermining the reliability of radiocarbon dates for terrace construction- are well known (external carbon inputs after the soil burial, mobile organics through the profile, erosion or disturbance of the Ab horizon, older organic matter embedded in the soil system), very few studies have systematically checked the reliability of the obtained ¹⁴C dates against all these caveats. In this communication I explore the integration of infrared spectroscopy (FTIR), soil micromorphology and terrace clustering as a tool to assess 1) the degree of preservation and isolation of buried soils under terrace fills, and 2) the reliability of radiocarbon dates from buried soils in dating the construction of terraces. I use the case study of Ricote (Murcia, SE Spain), the first irrigated-terraced area of Andalusi origin (AD 711-1492) systematically dated by means of AMS in Spain. Fourteen radiocarbon dates were obtained from soils buried under four different but synchronically constructed terraces, which were also systematically sampled for FTIR and soil micromorphology. Results show the potential of this methodological approach as a way to check whether ¹⁴C dates from buried soils actually reflect the foundation of a terrace cluster or result from contamination.

