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“Same as it ever was? – Structured light 3D-scanning and the specific gravity of late Roman transport amphorae from North Africa and Spain.”

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Traditional methods of quantification are here combined with recent advances in 3D modeling to address questions related to amphora production and the scale of amphora borne cargoes. While quantified data from Roman amphorae is frequently used as a proxy by which to evaluate economic history, these studies have privileged the shapes of the amphorae, identification of their contents, and their provenience based on the composition of the fired ceramic bodies. As methodologies of analysis have improved some data sets, especially weights, have fallen out of favor for comparative analysis. However, the weight of an empty amphora is closely related both to its displacement value, reflecting the volume of material used to form it, and to the relative density of the fired ceramic body. Moreover, weight can be readily measured by direct observation and the volume of an amphora easily calculated either directly or from a profile drawing. These data can then be leveraged to draw conclusions about the materials used to manufacture amphorae.

We analyzed seventy diagnostic fragments of North African and Spanish oil amphorae recovered from stratified contexts in the Palatine East Excavations in Rome. All sherds were scanned using a Breuckmann SmartScan structured light scanner to create 3D models. The volumes of each sherd were then determined using MeshLab-software, from which the specific gravity was calculated with weight data. The preliminary results show that North African and Spanish transport amphorae can be distinguished from one another by their specific gravities. The intra-group variation, however, turned out to be chronologically consistent; implying that while the shape of the ceramic container was modified through the centuries to improve cost-efficiency, the composition of the clay paste was not consciously changed to maximize it. With a large sample size, it may be possible to confirm the intra-regional homogeneity or to identify subgroups.