



Persisting in the face of challenge: the choice of raw materials in prehistoric ceramic production along the Eastern Adriatic coast

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Introduction

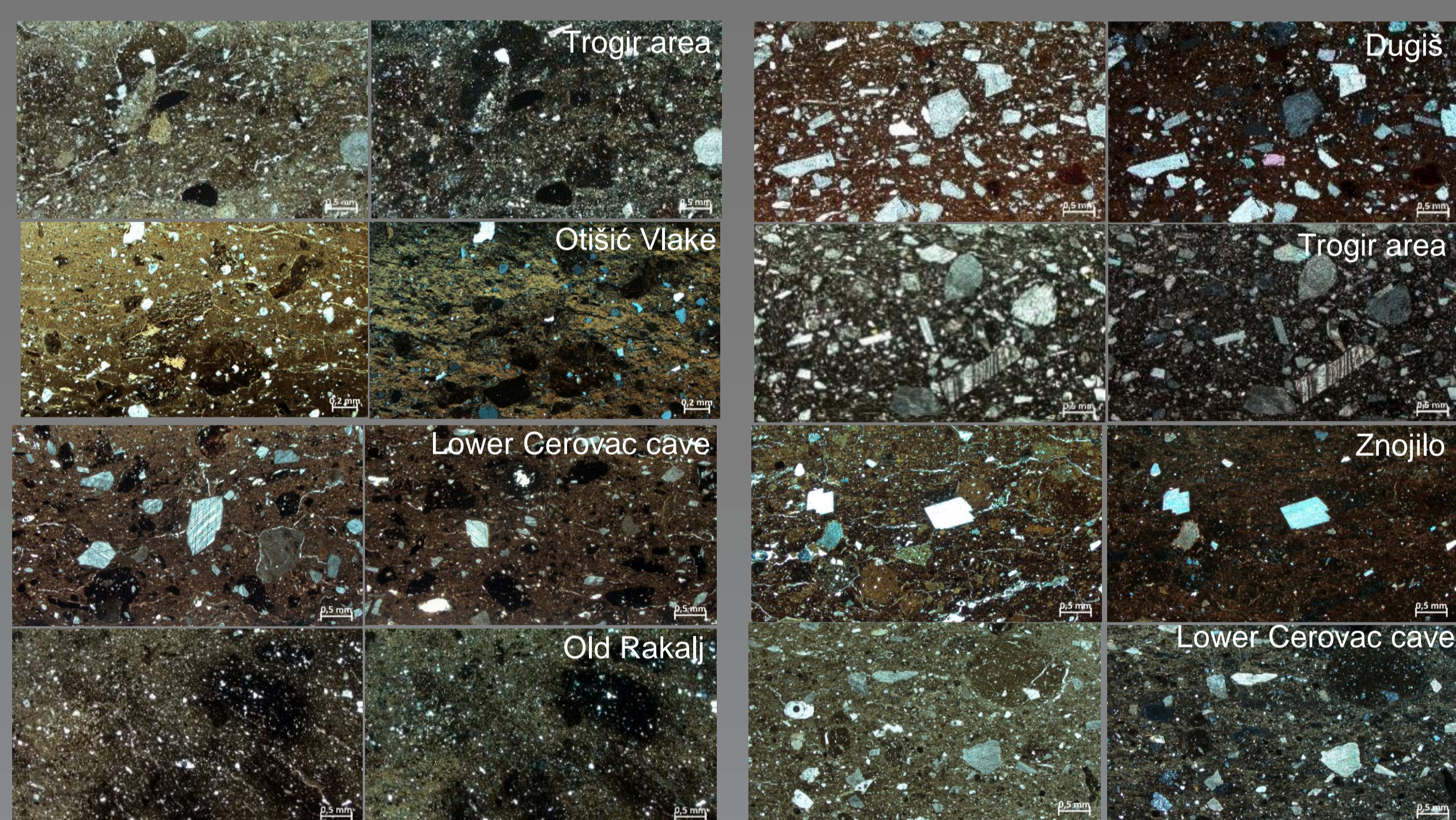
Studying the operational sequence of ancient craft practices provides valuable data for both technological considerations and socially oriented interpretations. Following this premise, the research aims to investigate Bronze Age pottery practices in the relatively unexplored area of the eastern Adriatic coast and hinterland. The assumption that variability in the choice of raw materials and production techniques can indicate socio-economic changes has encouraged us to consider prehistoric communities within a broader social context. The research focuses on ceramics from fourteen Bronze Age archaeological sites (155 samples) along the eastern Adriatic coast and the hinterland of central Dalmatia, forming four case study areas.

Area	Sites	Number of samples
Central Dalmatia coast	Trogir, Bristivica Šupljak, Vinišće Oriovišćak, Marina Drid, Sutlija, Plano-Kraljeva ograda, Biranj	51
Central Dalmatia hinterland	Dugiš-Otok near Sinj, Gala-Gacko, Otišić Vlake, Znojilo	47
Lika	Lower Cerovac cave	27
Istria	Old Rakalj and Šiljar	30

Aims and Methods

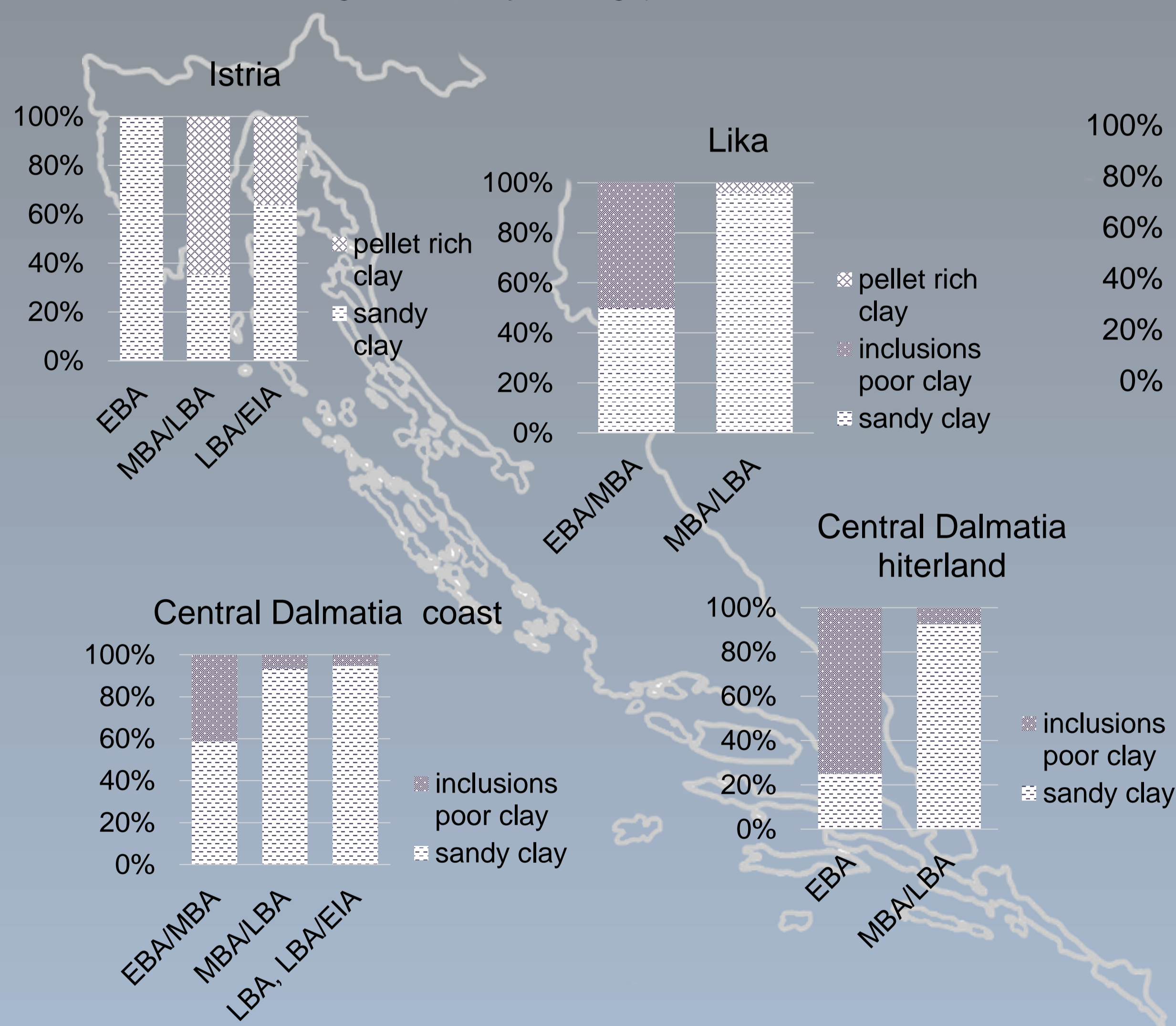
By applying a multi-analytical approach (optical microscopy, XRPD, p-XRF, SEM-EDS, and ICP-MS, ICP-ES), the goal is to determine the characteristics of paste recipes and the type and proportion of non-plastic tempers intentionally added to the clay. Field sampling of clay was also conducted in the areas of Istria and central Dalmatia for comparative analysis and to understand the provenance of the raw materials. The aim of the research is to consider the variability in pottery practices from the Early to the Late Bronze Age, to better understand the wide range of behaviours directly related to ancient pottery produced within specific social environments.

Pottery recipes

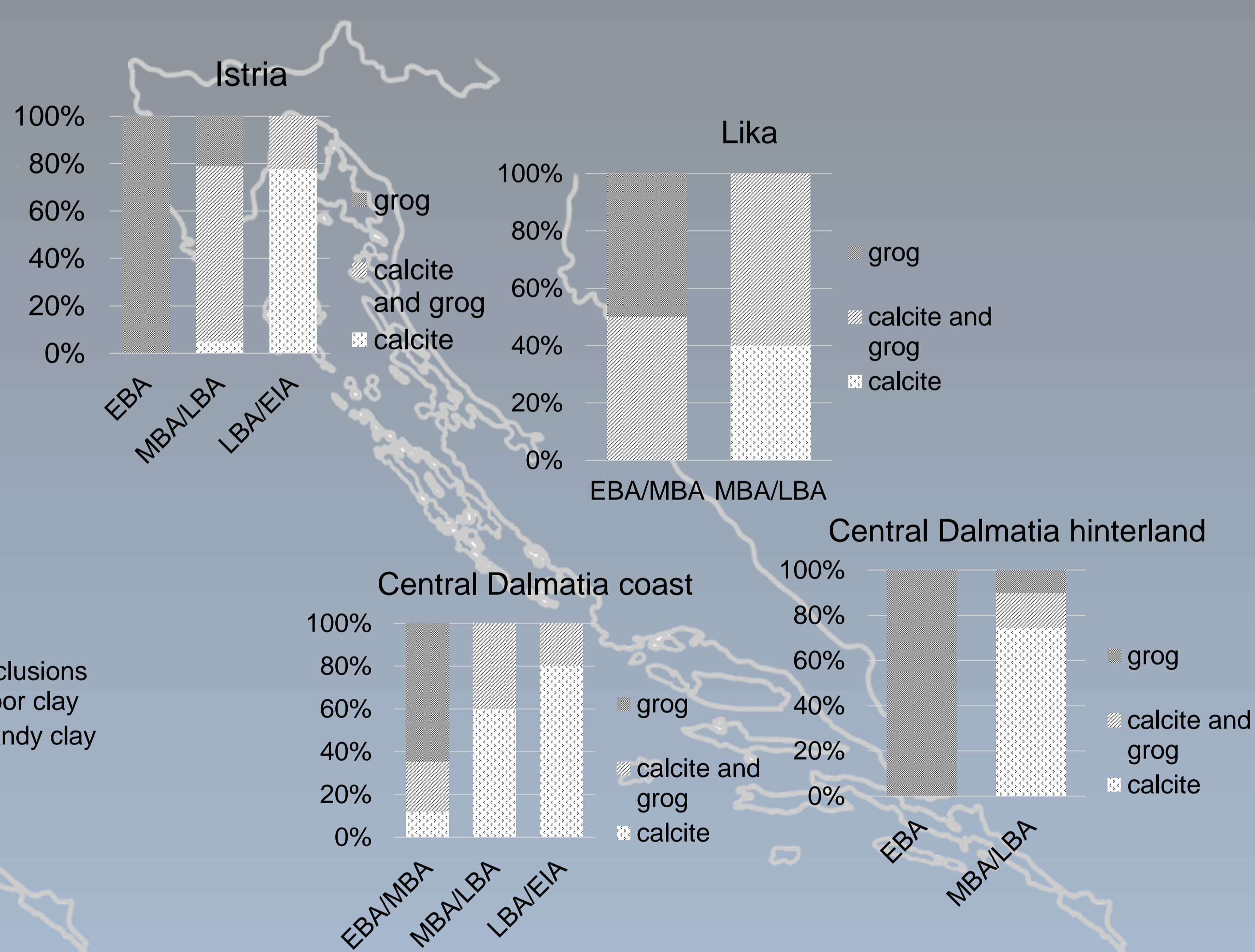


Thin section microphotographs of the Early and Middle Bronze Age pottery (left) and Middle and Late Bronze Age pottery (right)

Types of clayey material used from the Early to the end of the Late Bronze Age for 4 case study areas (EBA – Early Bronze Age, MBA: Middle Bronze Age; LBA: Late Bronze Age; EIA: Early Iron Age).



Tempering material used by potters from the Early to the end of the Late Bronze Age for 4 case study areas (EBA – Early Bronze Age, MBA: Middle Bronze Age; LBA: Late Bronze Age; EIA: Early Iron Age).



Discussion and Conclusion

The results indicate that during the second half of the 3rd millennium BC, at the end of the Copper Age and during the Early Bronze Age, no specific preference for the type of clay was recorded. However, as a tempering material, potters chose only grog. From the Middle Bronze Age onwards, potters began to add additional tempering material, crushed calcite. This practice appears to have first occurred in the Dalmatian hinterland by the end of the Middle Bronze Age. Elsewhere, a complete transition to calcite as the sole tempering material took place during the Late Bronze Age and continued into the Iron Age.

Nevertheless, the use of grog in Lika and the northern Adriatic peninsula of Istria persisted until the end of the Bronze Age, often in combination with calcite. Grog-tempered pottery is characteristic of Pannonia and northern Italy during the Middle and Late Bronze Age (Kreiter 2007; Cannavò et al. 2012; Cannavò, Levi 2014; Kudelić et al. 2018; Kudelić, Sirovica 2022; Karavanić, Kudelić 2019 – S. Karavanić, A. Kudelić, *Kalnik-Igrišće – Late Bronze Age Settlement*, Monographiae Instituti Archaeologici 14, Zagreb; Kreiter 2007 – A. Kreiter, *Technological Choices and Material Meanings in Early and Middle Bronze Age Hungary: understanding the active role of material culture through ceramic analysis*, BAR International Series 1604, Oxford, 2007; Kudelić, Sirovica 2022 – A. Kudelić, F. Sirovica, *Kurilovec-Belinščica – Tracing the Bronze Age of Turpolje*, Monographiae Instituti Archaeologici 11, 2022, Zagreb; Kudelić et al. 2018 – A. Kudelić, M. Mileusnić, A. Grzunov, K. Wriessnig, F. Ottner, Bronze Age pottery from Turpolje and Podravina region – archaeometric analysis, *Opuscula archaeologica* 39–40 (2015–2016), 2018, 37–52; Kudelić, A., Neral, N., Paraman, L. 2023. Archaeometry of Bronze Age Ceramics from the Area of Trogir. *Vjesnik arheološkog muzeja u Zagrebu*, 56(2). 10.52064/vamz.56.2.1; Neral et al. – Neral, N. Kudelić, A., Maričić, A., Mileusnić, M. 2023. Pottery technology through time: Archaeometry of pottery and clayey raw material from the multi-period site in eastern Croatia. *The Mining-Geology-Petroleum Engineering Bulletin*, 38(2), 1–21. <https://doi.org/10.17794/rgn.2023.2.1>

These results suggest complex mechanisms involved in the selection of pottery raw materials, particularly added materials; a correlation between the selection of tempering materials and both spatial and chronological frameworks. It is posited that differences in paste recipes arise not only from the availability of raw materials or their mechanical properties but also from more complex social and cultural contexts. To that extent, it is extremely important to understand the selection of these two different types of pottery raw materials, that could be interpreted as the maintenance of an older tradition transitioning to a new one. This dual use may also symbolize a symbiotic social organisation or a compromise period during the transition from one system to another i.e., persistence in the face of challenge.

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