

# Mineralogical Discrimination between Authentic and Recent Imitations of Pottery Manufacture in Zlakusa, Serbia

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Дигитални репозиторијум Рударско-геолошког факултета Универзитета у Београду

[ДР РГФ]

Mineralogical Discrimination between Authentic and Recent Imitations of Pottery Manufacture in Zlakusa, Serbia | Maja Milošević, Mihovil Logar, Biljana Đorđević | Nordic Clay Meeting/3rd Symposium Clays & Ceramics 2021 | 2021 | |

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## CLAYS & CERAMICS



CLAYS & CERAMICS

## BOOK OF ABSTRACTS

8<sup>TH</sup>-10<sup>TH</sup> FEBRUARY, 2021  
RIGA, LATVIA



**Nordic Clay Meeting / 3<sup>rd</sup> Symposium Clays & Ceramics 2021.**  
**Book of Abstracts. The Latvian Clay Science Society. 2021, 49 pages**

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Cover design: Linards Davidāns

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ISBN 978-9934-23-319-7



## Mineralogical Discrimination between Authentic and Recent Imitations of Pottery Manufacture in Zlakusa, Serbia

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The traditional coiling and hand-wheel manufacture of pottery with raw clay from the local source are characteristic for Zlakusa (western Serbia), which is on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity. Mass production of utilitarian ceramics and pottery items occurred in the Neolithic, mid 7th millennium BC, in the area of current territory of Serbia. What makes it a unique phenomenon, in technological terms, is the fact that with the discovery of new techniques and production processes, the old ways, already adopted and mastered continued to live and actively coexist until today. This also brings a rise in imitations of pottery manufacture.

The village of Zlakusa lacks proper materials, thus the raw clay originates from the nearby village of Dobrodo [1]. All the investigated pots were made from clay body prepared with raw clay mixed with crushed calcite in the ratio of 50:50 [2]. As previously reported [1], the raw clay consists mainly of smectite, kaolinite/halloysite and illite minerals with quartz, feldspars and smaller amounts of goethite present as non-clay minerals. A total of three vessels were analysed, broken down by type of workmanship: coiling technique (traditional handmade clay pot made by coiling on a hand-turned wheel) marked -1-; wheel throwing (on a wheel with an electric drive) marked as -4- and by moulding (application of a mould) marked as -5-.

Close examination of surface features and morphology was conducted to determine the characteristic attributes for a specific technique. Phase and mineral composition, texture, and structure of the samples were analysed by microscopy of cross-section preparations perpendicular to the vessel walls (Leitz polarization microscope). The numerical colour specification was calculated according to CIE (1931) based on diffuse reflectance spectra recorded on a CCS200 spectrophotometer (Thorlabs) in the 380 - 1000 nm range. A standard method was used to determine the water absorption of the investigated shreds of pottery (SRPS ISO 10545-3) reduced to the same dimensions.

Based on the obtained results of tested samples of clay pottery, there are a couple of conclusions. Observed difference in the surface colour, the appearance of bumps and bulges, horizontal lines or their absence, smooth surface and the presence of irregularities are the main indicators for assessing differences in the production of vessels. The maximum temperature, heating mode and oxidation atmosphere in the ovens were not the same for all samples. In that aspect sample - 1 -, which has been burned traditionally (wood-fired oven), stands out. A microscopic examination of the thin sections revealed a uniform mineral composition and porosity. For sample -5- a specific fluid-structure is consistent with the way it was introduced by the application of a mould. The measurements of moisture absorption showed that in this respect there was no significant difference between the samples, which would indicate the manufacturing procedure. Sample -1- has slightly higher water absorption than the rest of the samples.

Differences in terms of manufacture processes and their characteristics are evident and should be emphasized for better understanding and awareness of the cultural heritage that is traditional hand clay pottery making in Zlakusa, Serbia.

### **Acknowledgements:**

The present study has been supported by the Ministry of Education, Science and Technological Development, Serbia

### **References :**

- [1] Milošević M., Dabić P., Kovač S., Kaluderović L. & Logar M. (2019) Mineralogical study of clays from Dobrodo, Serbia, for use in ceramics, *Clay Minerals*, 1-9. doi:10.1180/clm.2019.49
- [2] Milošević M., Logar M. & Djordjević B. (2020) Mineralogical analysis of a clay body from Zlakusa, Serbia, used in the manufacture of traditional pottery. *Clay Minerals*, 55, 142–149