Pula (Croatia), 13 September 2026

REVIEW

of the doctoral dissertation by Bartosz Nowacki, MA, entitled

'Late Antique eastern Adriatic connectivity in the light of typology and distribution (GIS) studies and archaeometric analyses of Roman coarse wares'

(Polish title: 'Późnoantyczne sieci kontaktów w regionie wschodniego Adriatyku w świetle badań nad typologią i dystrybucją (GIS) oraz analiz archeometrycznych rzymskiej ceramiki typu coarse ware')

The dissertation was prepared at the Institute of Archaeology, UKSW. Supervisor: dr hab. Fabian Welc, University Professor; auxiliary supervisor: Dr Ana Konestra (Institute of Archaeology, Zagreb).

1. Formal characteristics of the dissertation

The dissertation comprises two volumes and 564 pages. Volume I contains eight chapters and the bibliography (Chapter 9, comprising 392 entries). Volume II consists of a typologically arranged catalogue of 385 sherds documented personally by the author (Chapter 10), 69 plates with drawings of all the pottery fragments included in the typochronology (Chapter 11) and two appendices: Appendix 1, with the list of vessel types and vessels assigned to the Fabric Groups and temper variants, and Appendix 2, with the full results of the chemical analyses. In addition, the dissertation contains 40 figures, 10 tables and 41 maps. It is written in English and has lists of figures, maps and tables, as well as a detailed table of contents.

Chapter structure: 1. Introduction (pp. 1–13), 2. Historical background (pp. 14–21), 3. Methods (pp. 22–45), 4. Typo-chronology of coarse ware from the eastern Adriatic (pp. 46–210), 5. Archaeometric analyses (pp. 211–232), 6. Distribution of ALACW (pp. 233–281), 7. Discussion (pp. 282–316), 8. Conclusions (pp. 317–333), 9. Bibliography (pp. 334–372). The proportions are appropriate: the typological chapter, which underpins everything else, occupies almost 165 pages, while the interpretative chapters are concise and do not repeat the material.

2. Topic, aims and research questions

The dissertation addresses an important and insufficiently researched aspect of Late Antique archaeology: the production and circulation of coarse wares in the eastern Adriatic and their implications for understanding regional connectivity.

The topic is well chosen and new. The author has distinguished and named a separate class of vessels – Adriatic Late Antique Coarse Ware (ALACW) – comprising primarily cooking ware produced in the Adriatic region, but in production centres that have not yet been located. He distinguishes it from imports that are already well understood and have their own typologies:

Aegean Cooking Ware (ECW), African Cooking Ware (ACW) and Illyrian Cooking Ware (ICW), as well as Italian coarse wares of the earlier period (e.g. pots with a square-shaped rim and profiling underneath – *olle a orlo modanato*, or Internal Red-Slip Ware – *a vernice rossa interna*). The author states clearly that he does not deal with these classes – and rightly so, since they are already quite well known. ALACW, by contrast, has so far been discussed only in studies of individual sites: Guran–St. Cecilia, *Tarsatica*–Principia, Veštar, Banjače and a few others. No regional synthesis has been written to date.

The state of the sources is difficult, and the author demonstrates this well. Published assemblages rarely come from contexts with well-documented stratigraphy. The dating of ALACW usually falls within two long, overlapping ranges: the 4th–6th and the 5th–7th centuries. The only site with more precise radiocarbon dates is Guran–St. Cecilia. Fabric analyses of this class from the eastern Adriatic region had not been carried out before. Nor do we know of any Late Antique pottery kiln from this area. There is also a geological problem: the eastern Adriatic is predominantly a karst landscape, clay deposits (flysch sediments) are scarce, and local workshops may therefore have been few.

Why, then, is this class of pottery worth studying? Because in the 5th–7th centuries coins, amphorae and fine tableware (e.g. African terra sigillata) become increasingly rare, whereas sherds of ordinary cooking pots occur at every site. The author argues convincingly that cooking ware can be a primary source for studying contacts and exchange in this period and, when well dated, also a chronological indicator for stratigraphic layers.

The aims are clearly formulated. The author sets out: (1) to document assemblages of coarse ware from Late Antique sites in the eastern Adriatic; (2) to reconstruct the distribution zones of individual types and attempt to identify production regions; (3) to describe how the coarse ware market changed, the appearance and disappearance of types and the transformations of the entire repertoire, which reflect changes in culinary habits. From these follow three research questions (pp. 4–5): what the typo-chronology reveals; what the distribution ranges were and whether supra-regional zones can be defined; and where the production centres were located and how far did products from, for example, workshops in northern Italy reach?

The study area comprises Istria (in antiquity Regio X Venetia et Histria) and the islands and coast of the province of Dalmatia, as far as the present-day border with Montenegro. The author deliberately excludes the mountainous hinterland, since its development followed a different rhythm from that of the coast, the boundary being formed by the Dinaric Alps with their few passes (Vratnik, Klis). The chronological framework extends from the beginning of the 4th to the 7th century, and for some types to the 8th century.

The author demonstrates a good understanding of the methodological difficulties involved in provenance studies. The dissertation explicitly notes that even the identification of a production site does not automatically establish the provenance of morphologically similar vessels from other sites without comparative mineralogical and chemical analyses.

The work rests on a solid foundation. The author personally examined the extensive material thanks to joint projects of UKSW and the Institute of Archaeology in Zagreb, a National Science Centre (NCN) grant (2020/37/B/HS3/02458), and the Croatian and EU projects Re:Set and SirAkt, which funded the petrographic analyses. He documented and analyzed the pottery from the sites Podšilo and Lukovac (Rab island), which were jointly investigated by UKSW and the Institute of Archaeology in Zagreb. He gained access to large, mostly unpublished pottery assemblages held in the museums of Šibenik, Poreč, Novigrad and Solin (Salona).

3. Content and assessment of individual chapters

Chapter 1. The Introduction is well structured: aim, state of research, research questions, study area, and a brief historical explanation of why the study area has been defined in this particular way. However, the explicitly formulated research hypotheses announced in subsection I.3 is missing. The state of knowledge on coarse ware classes (subsection 1.5) and ALACW itself – in Croatia, Slovenia, Austria and Italy – are discussed separately. The author frankly notes that research on pottery from Italian sites is the most advanced, but that even there some very important results are still lacking, e.g. a typo-chronology of Late Antique coarse ware from Ravenna and Classe, and that coarse ware often features in publications merely as a modest addendum to the assemblage as a whole.

Chapter 2. The historical background examines the changing administrative divisions and units (Regio X, Illyricum, later Dalmatia and *Praevalitana*), from the *Praetentura Italiae* of the Marcomannic Wars and Diocletian's *Claustra Alpium Iuliarum* to the Ostrogoths and the 7th century. The author consistently distinguishes what is certain from what is probable. For the period after 612 he states plainly that written sources are very scarce, epigraphic sources are absent, and finds associated with the Slavic incursions are few and uncertainly dated. This is important, as it shows how fragile the ground is on which the history of the region stands, and why coarse ware, as a mass material, is so valuable here.

Chapter 3. The methods are described exceptionally thoroughly, and this is one of the strengths of the work. The selection of sites was based on two criteria: functional diversity and the availability of material. The documentation comprises drawings, photographs and micrographs of fresh breaks, as well as a technological description.

The classification proceeds from functional classes (pots, bowls, baking plates, baking covers, lids), through groups defined by profile (flared, rounded and carinated bowls; conical and domed lids), to types and subtypes. Types were distinguished based on overall shape, the form of the rim and neck and – for pots – estimated volume. The author discussed certain typological features with a professional potter, Oleg Nesterenko, to distinguish intentional features from accidental ones. As a result, for instance, the manner of finishing the lip (rounded versus flat) was treated as a significant feature, since it requires a different technique.

The formula for pot volume deserves separate mention. The author calculated volume using the 'Slices' method (Thomas & Wheeler, 2002) for the three best-preserved pots, including one of Classe type, and on that basis derived a formula that is relatively easy to apply. This makes it possible to estimate volume from a rim fragment alone. The solution is ingenious and practical – I discuss its limitations in the critical remarks.

Dating is based on analogies from Italy, Slovenia and Austria, on the well-dated North Italic Burnished Ware and Classe type pottery as indicators, on African *terra sigillata* occurring in the same layers (Salona), and on radiocarbon dates from Guran–St. Cecilia and Lukovac. The archaeometric part of the methods (five subsections) and the part devoted to the GIS database are equally meticulous. The author discusses the three levels of distribution maps according to Orton and Hughes (2013) and explains why he was able to produce only the first two. He also presents in detail the concept of Gliozzo (2020): the three criteria of a 'solid reference group' (place, typology, chronology), the distinction between production groups and distribution–consumption groups, and the 'abundance criterion' as an auxiliary indication of the place of production.

Chapter 4. The typo-chronology covers 657 vessels and fragments from 30 sites. A total of 30 types of pots, 29 types of bowls, two types of baking plates, 6 types of baking covers, and 4 types of lids were identified. In addition, many of these types were divided into subtypes. Each type and subtype follows the same scheme: a general description with dimensions and fabric characteristics, chronology (distinguishing the period of highest frequency from the entire period of occurrence), distribution area, and analogies. The typology is quite detailed, especially regarding the most numerous pots, which account for 62 percent of the entire assemblage. In the case of bowls, which are far less numerous and account for 18 percent of the entire assemblage, the author tries not to introduce too many subtypes that would encompass only a single example. This meticulousness is an asset, but the author does not lose sight of the overall picture. He recognises that, with the progressive decline of production standards in Late Antiquity, 'each vessel has a unique form', and nevertheless builds a classification that is reasonably clear and memorable – as the literature he cites requires of a good typology.

Chapter 5. The archaeometric analyses are a novelty for this pottery class in the region. The author personally documented 385 fragments from nine sites: Novigrad–Hotel Cittar, Tar–Stancija Blek, Podšilo, Lukovac, Ist–Selišće, Novalja–Jaz Bazilika, Danilo, Danilo–Gradina and Salona. Based on macroscopic analyses he distinguished four fabric groups. Group 1 – by far the dominant one – contains mainly calcite temper. Group 2 comprises only four vessels associated with North Italic Burnished Ware – characterized by an abundant temper containing mainly quartz, lithoclasts of various origins, metamorphic rocks, sedimentary rocks, ooids and grog. Groups 3 and 4 are small (three vessels each), and no thin sections were made for them.

Thirty-five thin sections were prepared and analysed (Podšilo 11, Lukovac 6, Novigrad 5, Tar 5, Novalja 4, Danilo 4). They made it possible to distinguish two petrographic groups. PFG 1 – all samples but two – has a clay–quartz matrix and a dominant temper of angular calcite. Additional components form variants A–D: grog (A), fragments of mudstone and fine-grained limestone (B), marble grains with a granoblastic texture (C) and laminated limestone

resembling speleothems (D). For each variant the author found analogies at sites in Italy or Croatia.

The ICP-OES/MS chemical analysis covered twelve samples (seven from Podšilo, five from Lukovac). Most of the samples proved to have a fairly similar chemical composition. Sample 1 is a clear outlier and most probably an import from northern Italy. Sample 3 deviates less, the author attributes this to a different clay within the same calcitic tradition and notes that one of the samples from the Italian site of Canosa San Pietro has a similar La/Ce ratio. PCA on the REE alone confirms certain differences between the samples from Podšilo and Lukovac. The conclusions were discussed with Dr Małgorzata Zaremba (UKSW) and Dr Dorota Salata (Jagiellonian University). The whole is written cautiously and without overstatement.

Chapter 6. The distribution maps were produced in QGIS on a base map drawing on open resources (AWMC, Pleiades). Section 6.1 presents maps for individual types with graduated symbols reflecting the number of specimens from each site. Section 6.2 identifies distribution–consumption groups: Classe type (Map 6.33), North Italic Burnished Ware (6.34), Narona type pots (6.35), Ošlje–Gradac type bowls (6.36), Split type bowls (6.37) and Carinated casseroles (6.38). For each group the author gives a definition, chronology and range, and indicates where the classification rests on shape alone and where it is also supported by analysis of the fabric.

Chapters 7 and 8. The Discussion comprises a morphological overview, chronological tables for the types of pots, bowls, baking plates, baking covers and lids (Tables 7.1–7.4, distinguishing 'high frequency' from 'presence'), and an analysis of distribution at the local, regional and supra-regional levels. The Conclusions (Chapter 8) set out the three main findings: the identification of five *supra-regional ALACW distribution zones*, the question of provenance, and changes in the ALACW repertoire. Section 8.4 is a concise résumé.

Volume II. The catalogue and plates are arranged according to the proposed typology; the drawings, at a scale of 1:3, also include a metric scale bar, and the profile is usually placed to the right of the axis (Eastern European convention). Appendix 1 makes it possible to check which Fabric Group and which temper variant a given vessel has been assigned to; Appendix 2 presents the raw results of the chemical analyses. This makes the work verifiable and usable as a comparative tool.

4. Assessment of the methodology

I rate the methodology very highly. The author combines literature studies, morphological classification, macroscopic analyses carried out in person, and petrographic, geochemical and GIS analyses – while consistently separating observation from interpretation. His description of form proceeds by comparison with geometric solids, not by function. He keeps the macroscopic description of the fabric separate from the conclusions drawn from microscopic and chemical analyses. He formulates his conclusions on provenance last, and cautiously.

Several solutions are original: the consultation with a potter, the author's own formula for estimating pot volume, the multi-layered GIS database, and the adoption of the same analytical procedure as that applied to the pottery from Canosa San Pietro (Gliozzo et al. 2024), so that the results can be compared directly. The choice of the principles introduced by Gliozzo – production groups versus distribution–consumption groups – is well suited to a region without known kilns.

The author is frank about what his data cannot do. He bases his statistics on 605 diagnostic fragments counted by the MNI method (374 pot rims, 112 bowl rims, 65 lids, 49 baking covers, 5 plates). He states explicitly that these are qualitative rather than quantitative data – publications present a selection of the best specimens, and he himself selected material so as to capture as many types as possible, not their proportions. Nor does he conceal that, while documenting material during short stays in Croatia, quantification of entire assemblages was out of the question.

5. Results and scholarly contribution

The principal achievements of the dissertation are:

- **Definition of the ALACW class** and construction of its first regional typo-chronology – 657 vessels from 30 sites, 30 pot types and numerous types of bowls, baking plates, baking covers and lids.
- **Identification of five supra-regional distribution zones,** which refute the view that coarse ware circulated only locally.
- **Some of the first laboratory analyses of this pottery class from the region** and the separation of imports from the Po valley (NIBW, PFG 2) from vessels of the broad Adriatic calcitic tradition (PFG 1).
- **A methodological conclusion:** similar shape does not mean common origin, and a concentration of finds need not indicate local production.
- **Capturing changes in the repertoire of coarse ware, above all cooking ware:** the gradual disappearance of pans, casseroles and bowls, and the dominance of the rounded pot from the end of the 5th century.

The five zones merit closer discussion, as they constitute the principal finding. The northern Adriatic Zone corresponds mainly to the range of North Italic Burnished Ware – from Potentia/Porto Recanati on the Italian coast to the island of Ist – and functions from the mid-4th to the end of the 6th century; within it, from the beginning of the 5th century, various ALACW types circulate. The Northeastern Adriatic Zone partly overlaps with it and covers Kvarner, Istria, western Slovenia and Carinthia; it is defined by type I.14 pots and the carinated casseroles, and probably also by pots I.18 and I.22, whose largest concentrations are in Istria –

hence the suggestion of a workshop in the vicinity of Barbariga. The Pan-Adriatic Zone – from Apulia to Brač and Hvar, from the 5th to the 8th century – is formed by pots of types I.12 and I.13, largely of Classe type; I.12 reaches furthest south to Salona, and I.13 to Brač. The Central Dalmatian Zone comprises pots I.2 and I.15 and Split type bowls from Danilo, Salona and Split; the author suggests production in the Salona area and notes that, should further analogies from central Italy come to light (such as the one from Monte Torto near Osimo), the zone would have to be renamed Central Adriatic Zone. The Central and Southern Dalmatian zone comprises Narona type pots and Ošlje–Gradac type bowls, most numerous at Narona and in its surroundings, but reaching as isolated finds as far as Salona, Split and Ist. Narona type pots have no analogies outside the eastern Adriatic; for Ošlje–Gradac bowls there are similar forms in Friuli, Emilia-Romagna and the Marche, but the author does not include them in the group without verification of their fabric.

The distribution analysis also shows that pots circulated further than bowls – no bowl type matches I.12 and I.13 in either the number of sites or range. The author explains this not only by the fact that the pot became the principal cooking vessel, but also by the possibility that foodstuffs travelled in pots, and by the eastern coast, with its islands and bays, having been a natural sailing route. The few inland sites (Guran, Danilo, Narona, Mogorjelo) lie close to the sea or on a navigable river.

What I value most is the way the argument on provenance is conducted (Chapter 8.2). The author started from the hypothesis that most calcite-tempered vessels were imports from northern Italy. This was confirmed only for North Italic Burnished Ware: without abundant calcite temper, dominated by silica, and with a fabric identical to that at Aquileia and Porto Recanati. For the dominant calcitic group no resolution is possible. Here the author cites the caveat of the consulting experts: the presence of individual grains of marble or laminated limestone does not prove provenance, since the karst extends from Istria to Montenegro, and fine marble could have entered the clay wherever marble buildings stood. The author has therefore refrained from conclusions that the material does not permit. This is a mature stance.

The author has answered all three questions posed in the Introduction. To the first, he has shown the continuity of some forms, but also a clear break at the turn of the 4th and 5th centuries, when suppliers changed and ALACW appeared, as well as regional differences. To the second, he has defined five distribution zones. The third he has answered most cautiously: he has confirmed the Po valley origin of North Italic Burnished Ware and, for the rest, indicated only probable regions, including Istria. The sequence 'certain – probable – hypothetical' is observed in exemplary fashion.

6. Critical remarks

None of the remarks below undermines the value of the work or the author's independence. They show where current findings end and what is worth doing next. Many of them the author himself frankly acknowledges.

1. **Uneven source base.** Of the 657 vessels, the author personally documented and analysed 385 from nine sites; the rest come from publications that contain almost no information on fabric composition. Some types are therefore defined based on redrawn illustrations. This is evident, for example, in subtype VII.4.2 from Veštar, where the author himself writes that the fragment may be a bowl rather than a lid. It would be worth distinguishing more clearly between conclusions based on first-hand examination and those based on the literature – perhaps by marking this in the catalogue and on the maps.

2. **Small laboratory sample.** The chemical analyses comprise 12 samples from two sites on a single island (Rab); there are 35 thin sections, from six sites, all in the northern part of the study area (Danilo being the southernmost). Salona, Narona and the whole of southern Dalmatia do not have a single thin section, although separate zones and distribution/consumption groups have been defined there (Split type, Narona type, Ošlje–Gradac type). Macroscopic groups 3 and 4 have no petrographic data at all. Nor have clays or material from suspected production sites been examined. The Istrian hypothesis for the calcitic types rests on slender foundations – as the author admits.

3. **The proposed production sites are hypotheses built on hypotheses.** Barbariga for I.18 and I.22, the Salona area for bowls III.2.11 – these are inferences from the 'abundance criterion', without a known kiln, without clay and without thin sections. In the text they are usually balanced, but in places their status could be signalled more clearly.

4. **The volume formula.** It is calibrated on three vessels and based on four assumptions (approximately spherical shape, maximum internal diameter ≈ 115% of the rim diameter, subtraction of c. 12% of the volume of the sphere). Since volume is used to distinguish pot types, it would be worth testing how the formula performs for more slender or squatter vessels and stating the error range.

5. **Chronology derived mainly from analogies.** The author himself writes that the broad date ranges for most bowls do not result from many successive layers but from the imprecise dating of individual contexts, and that the dating of baking plates and baking covers is preliminary. Radiocarbon dates come from only two sites. Types are dated largely on the basis of the same analogies that serve to define them. This risks circular reasoning, which should be addressed explicitly alongside Tables 7.1–7.4.

6. **New terms.** ALACW, Pan-Adriatic Zone, Narona type pots, Ošlje–Gradac type bowls, Split type bowls, Carinated casseroles – these bring order to the material, but some of them rest on a few specimens or on analogies without fabric analysis. The author himself qualifies the Pan-Adriatic Zone with the words 'perhaps somewhat ambitiously'. The terms have yet to prove themselves in scholarly usage, and this is worth noting.

7. **Qualitative data versus conclusions about scale.** The maps are only of the first and second level according to Orton and Hughes, without percentage shares. Conclusions about the 'scale' and 'intensity' of distribution should therefore be formulated with reserve. A single summary table – site × type × count – would be useful.

8. **Language and editing.** The dissertation is written in English, which is not the author's native language. The text is comprehensible and correct, but there are typographical errors and minor lapses in punctuation. Citations are given inconsistently: sometimes 'Gliozzo 2020', sometimes 'Gliozzo 2020A'; 'Fabbri 2014' alongside 'Fabbri et al. 2014'; 'Riccato 2022' alongside '2022A/2022B'; 'Brogliolo' alongside 'Brogiolo'. Before publication these must be standardised and the in-text references checked against the bibliography. These are editorial rather than substantive remarks.

7. Editorial aspects

The dissertation has been carefully prepared. The figures, maps and plates are legible and of a high standard; the drawings and photographs meet ceramological standards, and the thin-section micrographs are well described. The bibliography is extensive and up to date – Italian, Croatian, Slovenian, Austrian and English-language – and includes the most recent works (2024–2025). The catalogue and plates fill a gap in the comparative material and will serve other researchers. The shortcomings listed in point 6.8 must be corrected before publication. Publication – ideally with a Croatian or Italian summary and version of the catalogue – is highly recommended.

8. Conclusion

Bartosz Nowacki's dissertation is an original and mature work. The author has posed an important problem, selected appropriate and multifaceted methods to address it, independently constructed the first regional typo-chronology of ALACW, conducted some of the first laboratory analyses of this class of pottery from the eastern Adriatic, and drawn well-documented conclusions on distribution zones, provenance and changes in the vessel repertoire. He has demonstrated that he is able to formulate and solve complex research problems independently and that he possesses broad knowledge in the discipline of archaeology.

Its principal achievement is the regional reconstruction of Late Antique coarse-ware distribution in the eastern Adriatic and the identification of several partially overlapping distribution zones. The most important result is therefore not the identification of a single production centre, but the demonstration that Late Antique coarse-ware circulation in the eastern Adriatic was complex, multi-centred, and spatially differentiated. The dissertation is a meaningful contribution to the archaeology of the Late Antique Adriatic. My critical remarks are points for discussion and pointers for the future; they do not lower my assessment.

I hereby state that the dissertation meets the requirements for doctoral dissertations laid down in Article 187 of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended). I request that Bartosz Nowacki, MA, be admitted to the further stages of the proceedings, including the public defence.

In view of its originality, its interdisciplinary character and the lasting value of the catalogue and plates, I also propose that consideration be given to awarding the dissertation a distinction, if the procedures of the Faculty so provide.

In conclusion, the dissertation demonstrates the candidate's ability to conduct independent archaeological research at doctoral level and makes a significant contribution to the study of Late Antique ceramics and connectivity in the eastern Adriatic.

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