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Quaderni della Scuola di Specializzazione in Beni Archeologici
Alma Mater Studiorum - Università di Bologna

ALMA MATER STUDIORUM - UNIVERSITÀ DI BOLOGNA

OCNUS

Quaderni della Scuola di Specializzazione
in Beni Archeologici

33
2025

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ANVUR classification: Class A journal - Area 10

Journal abbreviations as indicated in the «Archäologische Bibliographie» (Deutsches Archäologisches Institut).

Ocnus logo is inspired by a small bronze figurine from the 6th century BC from the Marzabotto foundry (Museo Nazionale Etrusco "P. Aria").

Publisher and Subscriptions

Ante Quem
Via Senzanome 10, 40123 Bologna
www.antequem.it

Subscription

€ 40,00

Website

www.ocnus.unibo.it

Exchange requests

Library of the Department of History, Culture and Civilisation
Piazza San Giovanni in Monte 2, 40124 Bologna
tel. +39 051 2097700; fax +39 051 2097802; federica.rossi@unibo.it

Authorisation by the Court of Bologna nr. 6803 del 17.4.1988

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ISSN 1122-6315

ISBN 978-88-7849-211-0 (press); 978-88-7849-216-5 (online italian); 978-88-7849-217-2 (online english)

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PIAZZA ARMERINA (ENNA), NEW EXCAVATIONS AND RESEARCHES AT VILLA DEL CASALE

Isabella Baldini*, Claudia Lamanna*, Giulia Marsili*, Carla Sfameni**

In the summer of 2022, a new research initiative was launched at the Villa del Casale in Piazza Armerina, arising from a collaboration between the Archaeological Park and the University of Bologna-CISEM, with contributions from CNR-ISPC, the University of Enna “Kore,” and the University of South Florida. The project focused on the villa’s western sector, an area that had remained largely unexplored, yielding new insights into its history from the Late Byzantine to the Arab-Norman period. Additionally, it sought to systematise existing documentation and reassess previous research.

The excavations conducted between 2022 and 2024, carried out within the framework of the Summer School ArchLABS through the support of the Erasmus BIP, Erasmus+, and UNIBO Alma Scavi programs, were coordinated by the University of Bologna. The findings offer fresh perspectives on the villa’s historical trajectory and patterns of settlement development up to the medieval period.

Introduction

In the summer of 2022, a new research program was launched at the Villa del Casale in Piazza Armerina as part of a four-year agreement between the Archaeological Park of Morgantina and the Villa Romana del Casale and the Department of History, Cultures, and Civilizations at the University of Bologna, which includes the CISEM (Interuniversity Center for Studies on Late Antique Housing in the Mediterranean). The project also involves the Institute of Heritage Science (ISPC) of the National Research Council, the Kore University of Enna, and the Institute for Digital Exploration at the University of South Florida¹.

One of the main objectives is to expand the known area of the Villa (fig. 1) through both new excavations and the use of non-invasive methods, as well as to develop an integrated digital archaeological documentation model.

The new archaeological investigations (2022-2024) have been carried out within the framework of three editions of an international Summer School (ArchLABS - Archaeological Heritage in Late Antique and Byzantine Sicily), funded by the European Erasmus Plus - Blended Intensive Program (BIP), coordinated by DISCI² (fig. 2). The multidisciplinary approach adopted in the project aims to integrate data from new archaeological excavations, geophysical surveys, and digital models of materials and structures with legacy data.

* Department of History and Cultures, Alma Mater Studiorum, University of Bologna.

** CNR-ISPC.

¹ In November 2023, the agreement with the Archaeological Park for research at the villa was renewed for a four-year period, with the participation of the CNR-ISPC alongside the University of Bologna.

² <https://site.unibo.it/piazza-armerina-cisem/it/summer-school>. The activities of the three editions of the Summer School, held from July 3 to 17, 2022, from June 5 to 18, 2023, and from July 1 to 13, 2024, saw the participation of the following professors, in addition to the authors: G. Bąkowska-Czerner (Jagiellonian University of Krakow); P. Barresi (Kore University of Enna); S. Cosentino (University of Bologna); R. Czerner (University of Wrocław); G. Deligiannakis (Open University of Cyprus); A. Karivieri (Stockholm University); P. Petridis (National and Kapodistrian University of Athens); D. Piay Augusto (University of Oviedo); M. Xanthopoulou (University of the Peloponnese); M.A. Valero Tévar (University of Castilla-La Mancha); and D. Tanasi (University of South Florida), along with their students. The organizing team for the two editions of the Summer School included F. Cardinale, C. Lamanna, G. Marsili, and M. Pizzi from the University of Bologna, as well as S. N. Hassam and K. Kingsland from the University of South Florida.

This line of research seeks to provide a broader understanding of the monument's evolution in the historical context, with particular attention to

the transformations that occurred between Late Antiquity and the Arab-Norman period.



Fig. 1. Drone image of the southern sector of the Villa (photo by I. Baldini, 2022).



Fig. 2. Drone image of the excavated trenches (photo by C. Lamanna, 2024).



Fig. 3. Survey of the excavated trenches (C. Lamanna, 2023).

Considering the long and complex history of research involving the monument and its surrounding territory, a fundamental aspect of the project is the re-examination of documentary and archival sources related to the earliest investigations, from those conducted by P. Orsi in 1929 to the excavations carried out between 2004 and 2014 by Sapienza University of Rome, directed by P. Pensabene (Pensabene, Sfameni 2006; Pensabene 2011; Pensabene 2014; Pensabene, Barresi 2019).

The digitization activities, carried out by the University of South Florida, included 3D laser scanning and both terrestrial and aerial photogrammetry for a detailed study of artifacts, mosaics, and structures. Additionally, a unified model for volumetric and spatial studies was developed to provide updated documentation of areas and structures.

The new excavations

During the excavation campaigns conducted between 2022 and 2024, attention was focused on the western area of the villa, near the large warehouses previously investigated by E. De Miro and G. Fiorentini between 1983 and 1988 (De Miro 1984). This sector, which had not yet undergone systematic excavations, had been identified as particularly significant by geophysical surveys that highlighted the substantial presence of archaeological deposits (Cozzolino, Mauriello, Monna 2019). Additional geophysical investigations were carried out over a larger area to the West during the first campaign (Baldini *et alii* 2023).

The stratigraphic excavations, carried out along a 10-meter strip on the western side of the large western warehouse, led to the identification of new structures (fig. 3) attributable to the Arab-Norman phase of the settlement (Baldini *et alii* 2024b). Among these, two particularly significant rooms emerged, characterized by walls built with small blocks and fragments of tiles bound with clay.

The first room, located in the southern portion of the area and leaning against the warehouse wall, has a rectangular plan. Inside, a collapse layer was uncovered, consisting of roof tiles, vacuolated tiles, and ceramic sherds dating to the 10th-11th centuries, which was fully excavated during the latest campaign.

The second room, situated in the NE part, stands out due to its different orientation and the cutting of the warehouse wall, highlighting its connection to a masonry section previously uncovered during De Miro's excavations and attributed to the early medieval settlement phase (11th-12th century; De Miro 1984: 60).

Additionally, sections of the wall that originally enclosed the Late Antique warehouse on its western side were uncovered, preserved at a lower level. The excavation was further extended inside this space, revealing structures already documented in previous excavation campaigns (De Miro 1984). However, their extent and chronology have now been better defined, and new structures have been identified.

The significance of the investigations in this sector lies in the complex stratigraphy encountered, ranging from the so-called *Villa Rustica* (1st-3rd centuries AD) to the late medieval period. The

late antique phase is represented by the warehouse structures, later obliterated by the Arab-Norman settlement. As in the excavations conducted by E. De Miro in 1983, no evidence related to the Byzantine period (6th-9th centuries) has been found.

Among the diagnostic artifacts associated with the southern structure adjacent to the warehouse, noteworthy finds include a Sicilian amphora dated to the 10th-11th century, the upper part of an amphora with painted walls, which shows parallels with 11th century Palermo productions, and a glazed basin with a carinated profile and grooved rim, dating to the late 10th-early 11th centuries (cf. Ardizzone 2012: fig. 40.21; Gallochio, Gasparini 2019: 267-269, figs. 10, 13).

Additionally, from a surface layer in the NW area of the excavation, a fragment of an *alfabeguer* – a vessel used for basil cultivation – dating to the 11th-12th centuries was recovered (cf. Barresi 2006: 148, no. 10).

These discoveries contribute to more precisely define the architectural and functional transformations of the site between Late Antiquity and the High Middle Ages, confirming the strategic importance of this sector of the Villa during the Arab-Norman period.

I.B.-C.S.

Digital strategies for enhancing Villa del Casale's heritage

The research activities also encompass the project *Digital Strategies for Enhancing Cultural Heritage: The Villa del Casale of Piazza Armerina, from the Late Antique Building Site to the Museum Collection* (Marsili, 2024; Marsili 2025; Marsili, Hassam 2025). This project serves as a case study for a research initiative funded by the European Union, titled *Virtual Technologies for Museums and Art Collections*, and functions as a spoke of the project *CHANGES - Cultural Heritage Active Innovation for Next-Gen Sustainable Society* (PE 0000020). The project aims to explore the use of virtual technologies for the promotion, preservation, and enhancement of cultural heritage in Italian museums and art collections (Balzani *et alii* 2024). Specifically, it focuses on the creation of a digital environment for enhancing the cultural heritage of Villa del Casale, part of which is displayed at the Museo di Palazzo Trigona, while the majority is conserved in the Villa's storerooms. These two locations represent the focal points around which the historical and archaeological evolution of the monument is narrated. However, the geographical distance between them often dis-

rupts the narrative continuity, hindering the development of integrated visitor pathways. Thus, the creation of a virtual enhancement space, freely accessible in both contexts, aims to reunite the fragmented heritage and enrich the narrative with new contributions, particularly through the integration of legacy data of various kinds. These data are drawn from numerous excavation campaigns conducted from the late 19th century to the present, utilizing different methodologies and objectives.

Firstly, a campaign was initiated to collect, systematise, and digitize excavation data from Gentili and De Miro within a GIS framework to verify the consistency and distribution patterns of various categories of finds across different settlement phases (Pizzi 2023; Ellena 2023). Secondly, a significant collection of artifacts from the Gentili excavations, previously scattered throughout the Villa's storerooms, was systematically recovered, cataloged, and digitized in 3D through collaboration with the University of South Florida. A key aspect of the project involves publishing this material within a Content Management System (CMS), to render otherwise inaccessible resources available, integrating them into the historical narrative, and laying the groundwork for further research paths, such as the virtual re-contextualization of the artifacts. A digital ecosystem was then established using Omeka.net, exploring the potential of the CMS to host and display 2D and 3D digital replicas of artifacts from past excavations and archival materials (Marsili, Hassam 2025) (fig. 4). Finally, a review of archival holdings stored at the regional Superintendencies led to the identification of previously unpublished graphic and photographic materials. Among these, numerous photographs document key moments from earlier excavations or depict the state of the monument prior to the extensive restoration work undertaken in the last century. Administrative documents and correspondence provide valuable insights into the logistical and operational aspects of early fieldwork, including details of significant discoveries such as the so-called Colossal Statue of Hercules.

Of particular significance is the discovery of an unpublished manuscript from the archives of the Superintendence for Cultural Heritage of Syracuse, containing excavation notes likely related to one of the early excavation campaigns (Marsili, Hassam 2025). This pocket-sized notebook, with 64 handwritten pages, is titled *Giornale degli Scavi in Contrada Casale Piazza Armerina*, but lacks references to the year of compilation or the identity of the author. The contents provide

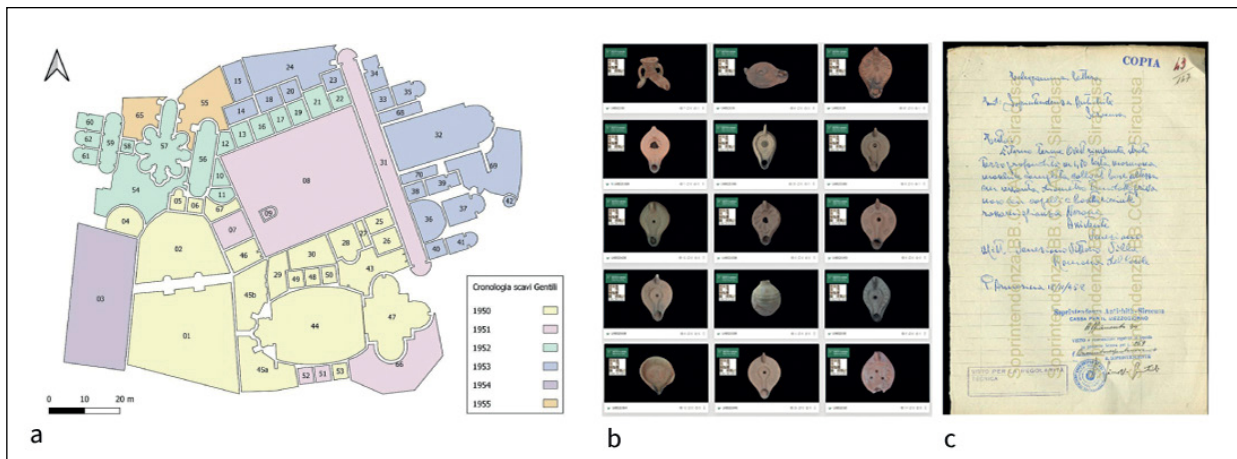


Fig. 4. a) Thematic map illustrating the chronology of Gentili's excavations (from Pizzi 2023); b) Digital collection of 3D replicas of findings from Gentili's excavations (©University of South Florida); c) Telegram announcing the discovery of a marble statue in the area of the baths in 1952 (after Marsili, Hassam 2025, ©Archive of the Archaeological Superintendence of Syracuse) (by G. Marsili).

a snapshot of the routine conduct of fieldwork, clarifying methodological perspectives and often referencing structural elements no longer extant due to dismantling during subsequent work. Internal references allow the manuscript to be situated within the context of the first regular excavation campaigns at the monument, thereby imparting exceptional documentary value, particularly in light of the absence of diaries or excavation notes prior to A. Carandini's investigations in 1970s.

G.M.

Programmatic activities for the study of water infrastructure and building materials

The Roman Villa continues to provide new research opportunities through the direct analysis of its structures. For instance, the study of ancient restorations on the aqueduct section near the *frigidarium* revealed an intriguing connection between a faucet found *in situ* and the aqueduct itself (fig. 5). The remarkable state of preservation of the *fistulae* and faucets was already partially documented (Gallicchio, Pensabene 2008: 72), but until now, they have not been the subject of a specific study. Neither the hydraulic capacity of the system nor the flow regulation mechanisms of the faucets have been analyzed in detail. These aspects will be explored in depth during future excavation campaigns, alongside further observations on the sewage and water supply channels.

Additionally, concerning the aqueduct's route and structures, a survey conducted in 2024 out-



Fig. 5. Section of the aqueduct connected to the *frigidarium* and a lead fistula *in situ*, view from the southwest (photo by C. Lamanna, 2024).

side the boundaries of the archaeological park led to the discovery of a previously unknown section. This find will significantly contribute to expanding knowledge of the water supply system in the area, enhancing our understanding of the main water source and its distribution methods.

The newly discovered section is located on private property and is partially obscured by dense vegetation, making direct observation challenging. As a result, only a portion of the masonry has been documented so far, and geographic coordi-

nates have been recorded for georeferencing. This will facilitate the analysis of its topographical and functional relationship with the Villa.

Regarding the thermal bath structures, an a-topotic analysis of the western *praefurnia* revealed

the presence of reused brickwork in the restorations. The measurements of these bricks correspond to those of some stamped bricks stored in the Villa's artifact warehouse (Pucci 1971: 254-256; Gentili 1999, vol. 2: 40; Baldini *et alii* 2025).

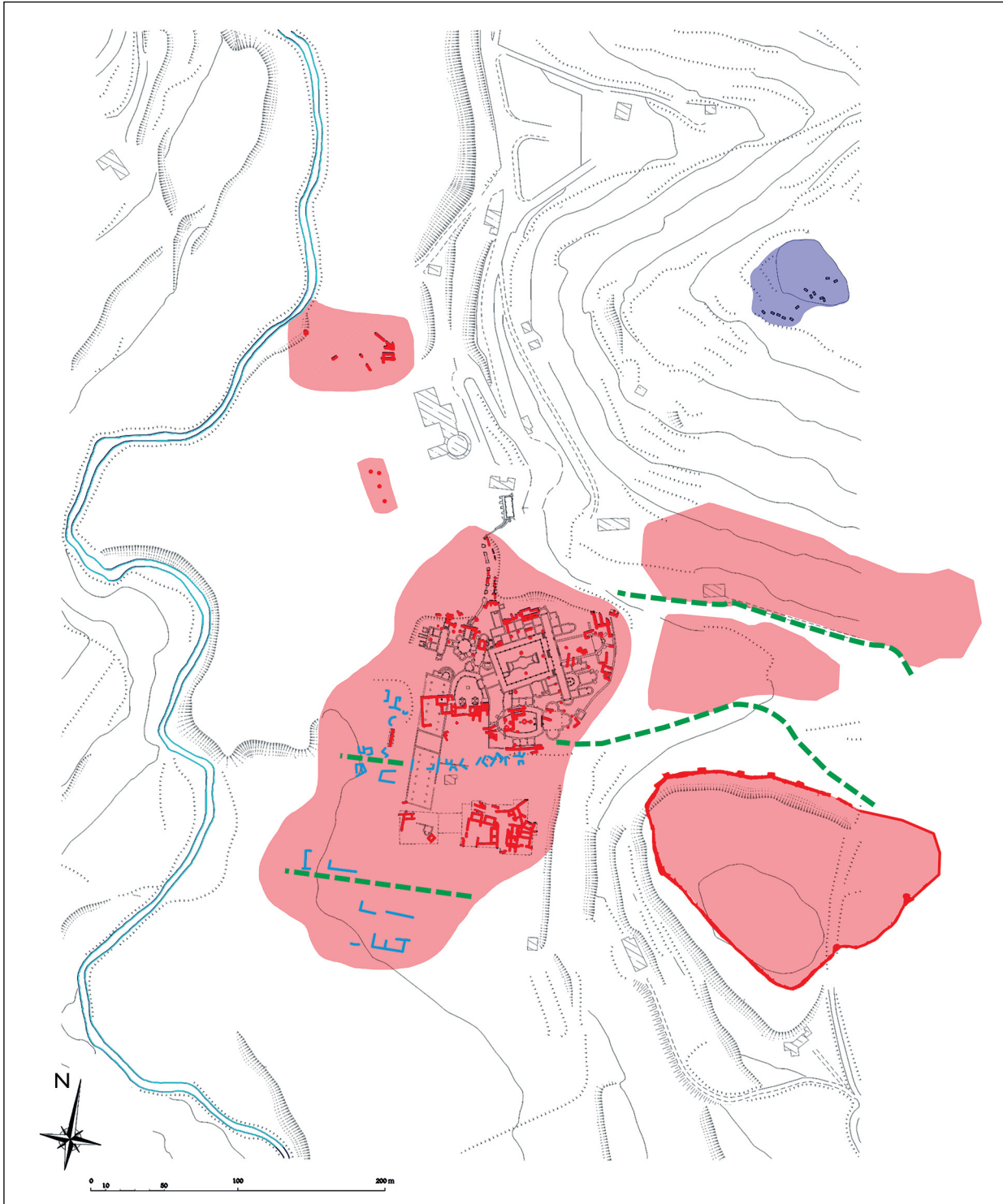


Fig. 6. Extent of the medieval settlement (drawing by C. Lamanna based on hypotheses by I. Baldini, C. Lamanna, and C. Sfameni).

These bricks were used to reconstruct the arches of the furnaces in the *calidaria*, as well as in the immediately adjacent structures. This discovery will provide new insights into the architectural management of the villa, suggesting the possibility of identifying a specific type of brick and pinpointing an additional construction phase and use of the thermal bath system. This will expand our understanding of its maintenance and transformation phases over time.

The planned activities for 2025, focused on the study of water infrastructure and building materials, will prioritize further investigation of the newly discovered aqueduct section and its connections to the villa's structures. The functioning of the hydraulic system, including flow capacity and regulation mechanisms, will also be examined. Additionally, the study of building materials, particularly the bricks reused in restorations, will continue. The goal is to outline the construction and maintenance phases of the thermal bath system and its associated structures, within the broader context of an ongoing study on late antique thermal installations in Sicily.

C.L.

Research perspectives

The archaeological research in the coming years will extend to areas south of the Villa, beyond the sectors previously investigated by the Sapienza excavations, with the aim of connecting the already studied areas and acquiring new data on the extent of the settlement (fig. 6). To this end, geophysical surveys have been conducted by researchers from the Geophysics Laboratory at the CNR-ISPC in Lecce, with support from the European Research Infrastructure for Heritage Science, Italian node, E-HRIS.it. These surveys have yielded promising results regarding the presence of structures and possibly roadways in various areas south and west of the Villa (Baldini *et alii* 2024a).

New remote sensing and geophysical surveys, including the use of LiDAR technology, will accompany field research in 2025 to investigate previously unknown sectors and link them to areas explored in earlier studies (Bonanno 2020), both to the north of the Villa and on the hills to the east.

The acquisition of new data regarding the extent of the settlement across its various phases will not only aid in directing archaeological research more effectively in the coming years but will also facilitate the integration of data emerging from

previous investigations, as outlined in the ongoing research project.

I.B.-C.S.

Acknowledgements and institutional collaborations

The excavation is being conducted under an Operational Agreement for Archaeological Research (protocol no. 0006475/2023). Institutions involved: DiSCi, University of Bologna; CNR, Institute of Heritage Science; Archaeological Park of Morgantina and Villa del Casale in Piazza Armerina; University of South Florida. We would like to express our sincere gratitude for the support provided for our activities by the Municipality of Piazza Armerina, the company Ambiens s.r.l., and the “Letterio Villari” Archaeological Group of Piazza Armerina.

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