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MUZEUM HISTORII POLSKI

NEA PAPHOS

PRELIMINARY STUDY OF AMPHORAE OF THE MAU XXVII/XXVIII TYPE

M. Daszkiewicz, H. Meyza, G. Schneider

The fragments analyzed represent one shape type of mid-Imperial amphora called Mau XXVII/XXVIII, after August Mau's original classification of the Pompeii material in 1909.[1] The type is also known as: Agora G199,[2] Ostia form 631,[3] Benghazi Mid-Roman amphora 4,[4] Paphos OD Roman Amphora type III.[5] The type's main popularity falls in the 2nd-3rd century and continues into the 4th century.[6] The amphora distribution is somehow related to Cypriot Sigillata of the 2nd century.[7] The most extensive

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1 A. Mau, in: R. Schoene, *Tituli vasis fictilibus inscripti, Corpus Inscriptionum Latinarum* IV, Berlin 1871, Vasorum Formae, after p. 167; R. Schoene, A. Mau, *CIL* IV, Supp., pars II, Berlin 1909, *Vasorum Formae*, after p. 790.

2 H.S. Robinson, Pottery of the Roman Period, *The Athenian Agora* V, Princeton 1959, p. 43, Pl. 8.

3 C. Panella, Anfore, in: *Ostia* III:2, *Studi Miscellanei* 21, Roma 1973, pp. 474-476, Fig. 34.

4 J.A. Riley, Coarse Pottery, in: *Excavations at Sidi Khrebish*, Benghazi (Berenice), Vol. II, *Libya Antiqua Supp*. V:2, Tripoli 1979, pp. 186f.

5 J.W. Hayes, *The Hellenistic and Roman Pottery, Paphos III,* Nicosia 1991, p. 91f., 204f., Fig. LXX:9, LXXII:7, Pl. 24:3-4, 6-8.

6 The date is supported mainly by finds in Paphos and Berenice; for late pieces, see Agora finds, M 239, and probably, G. Bass, F. van Doorninck, A fourth-century shipwreck at Yassi Ada, *AJA* 75, 1971, p. 34, Pl. 2: Fig. 9 (Type II); both have different feet, no longer mushroom-ended, and handles without the classical angular pinch (in the Agora pieces the pinch comes close to the shoulder).

7 H. Meyza, Sigillata cypryjska - stan badań, in: *Cypr w badaniach polskich* (in print), Fig. 1. Note abundance in Marina el Alamein, cf. G. Majcherek, in: W.A. Daszewski et al., Excavations at Marina el-Alamein 1987-1988, *MDAIK* 46, 1990, p. 49, Fig. 12:4; id., Remarks on pottery from the recently discovered Roman site in Marina el-Alamein, in: *Acts of the 5th International Congress of Egyptology*, Cairo 1988 (in print).

recent study devoted to this type is that by John Leonard,[8] who notes its earliest occurrence in Caesarea, possibly of Herodian date. Leonard tries to relate various macroscopic and unstandardized fabric descriptions of amphorae produced at different sites into a single fabric classification. It seems that at least 4 different fabrics can be differentiated by macroscopic examination (1 – clean red micaceous, 2 – red with large impurities (late?), 3 – buff-beige soft with impurities, 4 – hard reddish-orange with dark beige surface). A production site of one (the first?) of the fabric varieties was discovered on the south coast of Turkey at Anemur.[9]

At Paphos many varieties are present, but our first aim was to define the most popular class. Sherds from different parts of the vessel were selected. Ten samples belong to a buff to light reddish ware with visible inclusions (groups 3-4),[10] which according to Hayes should with more reason be considered as local (his Ware II). Four different sherds, not entirely homogeneous macroscopically, but sharing few visible clastic inclusions apart from mica, and similar to Hayes' Ware I (in spite of his reservations to variety present also in an earlier context in Athens – G199) have been used for contrast control.[11]

Fourteen samples were analyzed by the WD-XRF for major and trace elements. Four samples (D711-D714) were also studied in thin sections. From the analysis it is clear that the samples do not form one homogeneous group, but are of different provenance. The samples may be preliminarily classified into six groups (Table 1). This grouping, however, must be checked by a later series of samples studied chemically and in thin sections.

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8 J.R. Leonard, The Anchorage at Kioni, in: *Ancient Akamas* I (ed. J. Fejfer), *Aarhus* 1995, p. 144f., 153f., Figs 17-19, 32-33.

9 C. Williams, Anemurium: the Roman and Early Byzantine Pottery, *Subsidia Medioevalia* 16, Toronto 1989, pp. 91-96, 94 in particular.

10 D670, D671-D673, D675-D677, D679, D713, D714.

11 D674, D678, D711, D712.

Table 1. Results of chemical analysis.

Analyses were made in the laboratory of the Arbeitsgruppe Archaometrie FU Berlin by WD-XRF. Analysis of ignited samples, major elements (A)in percent by weight, normalized to a constant sum of 100%, the original total is given in the column "Total", loss of ignition at 900°C is given in column "LOI", traces (8) are in ppm, elements in brackets are determined with lower precision, in samples of 100mg not all trace elements can be determined.

(A) MAJOR ELEMENTS (% by weight)

Sample	SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO	CaO	Na2O	K2O	P2O5	(S)	LOI	TOTAL
Group I													
D 670	50.22	0.64	11.65	5.26	0.073	2.99	26.48	0.53	1.97	0.19	0.50	11.22	99.35
D 671	54.24	0.69	12.87	6.15	0.085	3.07	20.15	0.67	1.90	0.17	0.28	6.99	99.33
D 673	49.86	0.67	12.71	5.91	0.078	2.79	25.24	0.65	1.91	0.17	0.44	8.01	99.14
D 675	51.19	0.68	12.35	5.78	0.095	3.14	24.27	0.55	1.81	0.14	0.48	7.76	99.21
D 713	49.24	0.63	12.34	5.64	0.074	4.13	25.23	0.63	1.93	0.16	0.20	9.20	99.58
D 714	52.19	0.65	12.60	6.27	0.083	3.82	21.57	0.97	1.65	0.20	0.20	7.27	99.71
Group II													
D 677	51.35	0.70	13.87	6.44	0.103	3.62	20.62	0.73	2.40	0.18	0.39	7.90	98.97
Group III													
D 679	51.35	0.78	15.04	5.72	0.069	1.74	22.00	0.76	2.38	0.16	0.10	10.90	99.52
Group IV													
D 672	51.49	0.88	18.02	6.51	0.063	2.50	16.99	0.73	2.72	0.11	0.11	6.87	100.80
Group V													
D 711	50.66	0.87	23.13	12.25	0.280	2.77	5.22	0.66	4.00	0.15	0.06	2.51	98.34
D 712	49.24	0.85	21.26	15.25	0.887	2.75	5.20	0.71	3.67	0.19	0.06	2.34	99.17
Group VI													
D 674	56.63	1.04	22.82	8.32	0.032	1.87	5.23	0.61	3.33	0.11	0.00	2.08	100.87
D 676	53.68	0.93	21.45	8.09	0.058	1.61	10.10	0.53	3.41	0.14	0.03	4.11	101.07
D 678	62.61	0.92	20.38	8.48	0.051	1.75	1.42	0.57	3.75	0.08	0.00	3.48	100.90

(B) TRACE ELEMENTS (ppm)

Sample	V	Cr	Ni	(Cu)	Zn	Rb	Sr	Y	Zr	(Nb)	Ba	(La)	(Ce)	(Pb)	(Th)
Group I															
D 670	80	230	145	44	60	71	563	22	141	18	345	20	67	11	23
D 671	99	586	155	58	69	74	639	26	157	19	412	36	67	18	20
D 673	125	386	150	48	64	73	620	24	148	21	292	70	80	14	23
D 675	134	777	158	42	66	63	656	23	157	20	394	19	72	11	22
D 713	-	535	146	-	68	79	657	-	133	-	339	-	46	66	-
D 714	-	1283	144	-	65	69	664	-	246	-	311	-	57	152	-
Group II															
D 677	118	275	204	55	88	92	655	28	156	20	413	29	66	10	23
Group III															
D 679	124	140	89	35	57	88	505	28	181	21	486	40	68	19	24
Group IV															
D 672	134	145	80	47	77	116	405	29	201	25	527	33	83	14	26
Group V															
D 711	-	120	56	-	65	149	144	-	163	-	673	-	56	46	-
D 712	-	116	73	-	70	139	172	-	154	-	912	-	83	57	-
Group VI															
D 674	195	161	62	54	53	141	348	24	239	31	482	32	93	24	31
D 676	155	130	47	38	62	143	250	27	193	26	510	46	92	22	29
D 678	145	119	61	40	69	145	175	35	208	32	784	41	84	55	32

The amphorae of groups I to IV are made from calcareous (marl) clays. This could be ascertained by thin sections only for two samples and should be proved for the others, too. The first two groups are characterized by very high Cr and high Ni trace contents and thus are dearly distinct from the other groups. Because of the similarity in the major element concentrations, the six samples of group I, in spite of their large variation in Cr and Zr, were combined in one. In thin sections samples D713 and D714 are nearly identical in the calcareous matrix and in grain-size, quantities and types of non-plastic inclusions, mainly of chert including some radiolarite, and quartz (Tables 2 and 3). Bioclasts typical of the Upper Miocene (Tortonien) can be detected in one sample. In the other sample, a high firing temperature is the reason why only pores can be related to these bioclasts. Sample D677 (group II) may be distinguished from the first group by higher nickel trace contents. Two other samples (D619, D672), provisional groups III and IV, are different from all previously discussed samples in significantly lower chromium and nickel trace contents. The differences between these two samples, however, are so small that new samples and additional thin section studies may change these groups to only one group.

Samples D711 and D712 are chemically (Table 1) and in thin sections (Tables 2 and 3) very similar and characterize amphorae made from a micaceous, non-calcareous and very iron-rich clay with low Cr and Ni contents. Beside the exceptionally high iron content, these samples are also characterized by high aluminum and high potassium contents. Grain size distributions are similar in both samples. The mostly unrounded non-plastics up to 0.5 mm consist of polycrystalline quartz; some with recrystallized rims as are typical of a sedimentary origin. Besides, magmatic and metamorphic rock fragments, some with epidote, are found.

The remaining three analyzed samples, also with high aluminum, iron, potassium and low chromium and nickel, do not form

Sample	Grain size [mm]			
	<0.1	[0.1-0.5]	>0.5	max grain siz
D711	90	10	rare	0.3 (0.5)
D712	85	15	rare	0.3 (0.5)
D713	30	35	35	0.8
D714	30	40	30	0.8

Table 2. Results of granulometric analysis (after M. Daszkiewicz, J. Jelitto, Pottery from Nea Paphos 1989 Microscopic Analysis of Thin Sections - unpublished report).

Sample	Matix	Q	Pl	Af	Cc	Px	Am	M	Rf	Om
	% by volume									
D711	56.7	22.2	3.2	3.2	3.4	2.2	1.2	3.6	0.0	4.3
D712	53.1	22.7	0.8	2.7	3.5	4.7	5.1	3.9	1.9	1.6
D713	68.7	12.8	0.8	1.2	7.5*	-	0.6	-	5.9	2.5
D714	65.7	20.3	0.1	1.6	6.1	-	0.6	-	3.9	1.7

Q - quartz
Pl - plagioclases
Af - alkali fedspars
Cc - carbonates
Px - pyroxenes
Am - amphiboles
M - micas
Rf - rock fragments
Om - opaque minerals
* - including bioclasts from carbonates

Table 3. Percentages of matrix and non-plastic inclusions (point counting).

a homogeneous group. This is due to largely varying calcium content. Only these samples have not been studied in thin sections but examination of pottery from other regions suggests that these differences may be explained by a varying quantities of cryptocrystalline calcite nodules. This would be the case when the clays come from deposits of calcareous clays where water had leached the carbonates from the upper layers and redeposited them in the lower ones. Such raw material may have largely varying amounts of carbonaceous remains.

The results of the analyses show that amphorae of type Mau XXVII/XXVIII found at Nea Paphos are not all of the same provenance. At least three geochemically different regions (high and low Cr and Ni, marl and non-calcareous clays) must be taken into account. In our first small series of analyses, six groups of different provenance can be detected. The analyses given in Table 1 may help to attribute one or more groups to reference groups given in topic literature. None of the amphorae is similar in composition to CS and CRS samples studied in a previous project. Notwithstanding, the basic group characterized by high chromium and nickel (calcareous) may tentatively be related to a workshop in Paphos postulated by Hayes. The second group, with low chromium and nickel with high aluminum, iron and potassium, which apart from one sample (D676) belongs to the red group, may possibly come from the Anemurium workshop. These tentative conclusions must be treated as hypotheses to be tested in the future. More research and specifically more samples are needed with respect to:

– the relation of the red group to the Anemurium workshop and the homogeneity of its production;
– homogeneity of Cr and Ni content in the calcareous group, as well as paleontological and archaeological search for a possible source of the clay and non-plastic inclusions.