

# Excavation of the small animal cemetery at the Roman Red Sea harbor of Berenike in 2018 and 2019



**Abstract:** The paper discusses funeral practices with regard to animals in ancient Berenike, investigated in two seasons of exploration, 2018 and 2019 (trenches BE18/19-107, BE01/19-48 and BE19/132). Three groups of animals are represented almost exclusively in the burials. These are cats, dogs and monkeys, buried mainly around the top and on what was the eastern slope of a sand dune. In the mid 1st century AD, an enclosure wall roughly 0.50 m thick was built enclosing a space of about 20 m<sup>2</sup> with no apparent floor surface inside it. Outside the wall, a clay pavement surrounded the enclosure on at least three sides. Animal burials accumulated around this enclosure for the next century or so, achieving the greatest density close to the feature. By the 2nd century AD urban rubbish had encroached heavily upon the area taken up by the burials. Most likely in the beginning of the 3rd century AD, the wall was dismantled, perhaps together with the features that had been inside the enclosure (statue, column, tree?). Interestingly, two goats were buried by the two excavated corners (northeastern and northwestern ones) in this period. One of these represented a variant of the species not typical of Northeastern Africa.

**Keywords:** field-report, cemetery, animals, early Roman Egypt, Berenike

Piotr Osypiński<sup>1</sup>  
Marta Osypińska<sup>2</sup>

<sup>1,2</sup> Institute of Archaeology and  
Ethnology, Polish Academy of  
Sciences, Poznań

## **Team**

*Dates of work:* January 2018; January 2019

*Berenike Project Co-Directors:* Prof. Steven E. Sidebotham (University of Delaware) and Iwona Zych (Polish Centre of Mediterranean Archaeology, University of Warsaw)

*Principal Investigator:* Assist. Prof. Marta Osypińska, archaeozoologist (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Poznań; 2018, 2019)

*MOA representative:* Mahmoud Ahmed Hussein (Red Sea Governorate Office)

*Archaeologist:* Dr. Piotr Osypiński, archaeologist (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Poznań; 2018, 2019)

*Berenike Project staff assisting with the grant project:*

*Documentalists:* Kamila Braulińska (Institute of Archaeology, University of Warsaw; 2019); Teresa Witkowska, drawing (freelance; 2019)

*Surveyor:* Szymon Popławski (Wrocław University of Science and Technology; 2018, 2019)

*Ceramologist:* Dr. Krzysztof Domżański (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Warsaw; 2019)

*Registrar:* Iwona Zych (PCMA University of Warsaw; 2018, 2019)

*Funding body:* Polish National Science Centre research grant (NCN 2016/23/B/HS3/03576) conducted in consortium by the Institute of Archaeology and Ethnology, Polish Academy of Sciences and the Polish Centre of Mediterranean Archaeology, University of Warsaw

## **Acknowledgment**

Special thanks are due the heads of the Berenike mission, Iwona Zych and Steven E. Sidebotham, for their invariable determination and patience thanks to which the project has progressed as scheduled and without major disruption. Also Szymon Popławski (geodetic measurements and 3D documentation of selected ecofacts), Krzysztof Domżański (pottery analysis), and Kamila Braulińska (studio photography of artifacts) for their diligent assistance.

The excavations at Berenike (Berenike Troglodytica) on the Red Sea coast of Egypt include a burial ground zone for small animals dated to the early Roman period (1st–2nd century AD). It was located on what were then the northwestern fringes of the town. The reported two excavation seasons complement previously presented data (Osypińska and Osypiński 2018), discussing only those aspects that are directly related to animal burial practices. It should be noted, however, that trenches BE18/19-107 and BE01/19-48 also provided data on a much earlier phase of occupation (Ptolemaic period) and yielded valuable text sources, namely ostraca, from layers of early Roman trash (for details, see forthcoming

reports edited by S.E. Sidebotham and I. Zych). In addition to excavations in a strict sense carried out in three trenches [Fig. 1], archaeozoological and pottery-focused research programs were also conducted, as well as provisional conservation of organic and metal artifacts unearthed in the cemetery zone. The project has thus engaged a wider circle of specialists associated with the larger Berenike Project, whom the authors would like to thank sincerely for their assistance.

The project has collected data on 304 complete burials of companion animals from the area studied to date. This is the largest dataset on the ancient population of domestic cats, as well as dogs and monkeys, imported to Egypt.

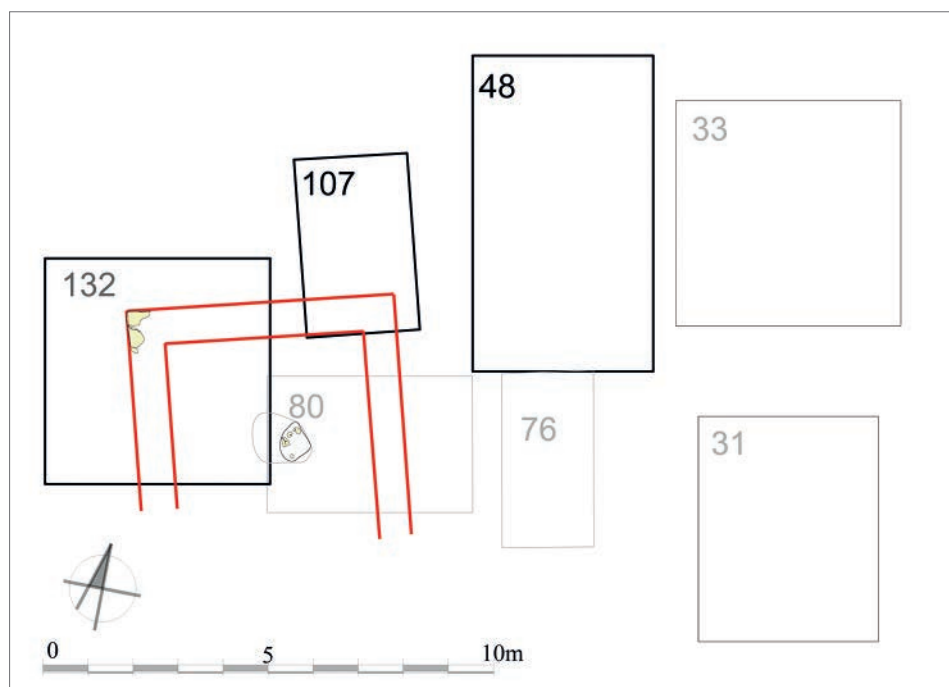


Fig. 1. General sketch of the excavation trenches in the animal cemetery area, trenches explored in 2018 and 2019 marked in black; wall reconstruction in red (Berenike Project: PCMA UW–IAE PAN | measurements and sketch S. Popławski)

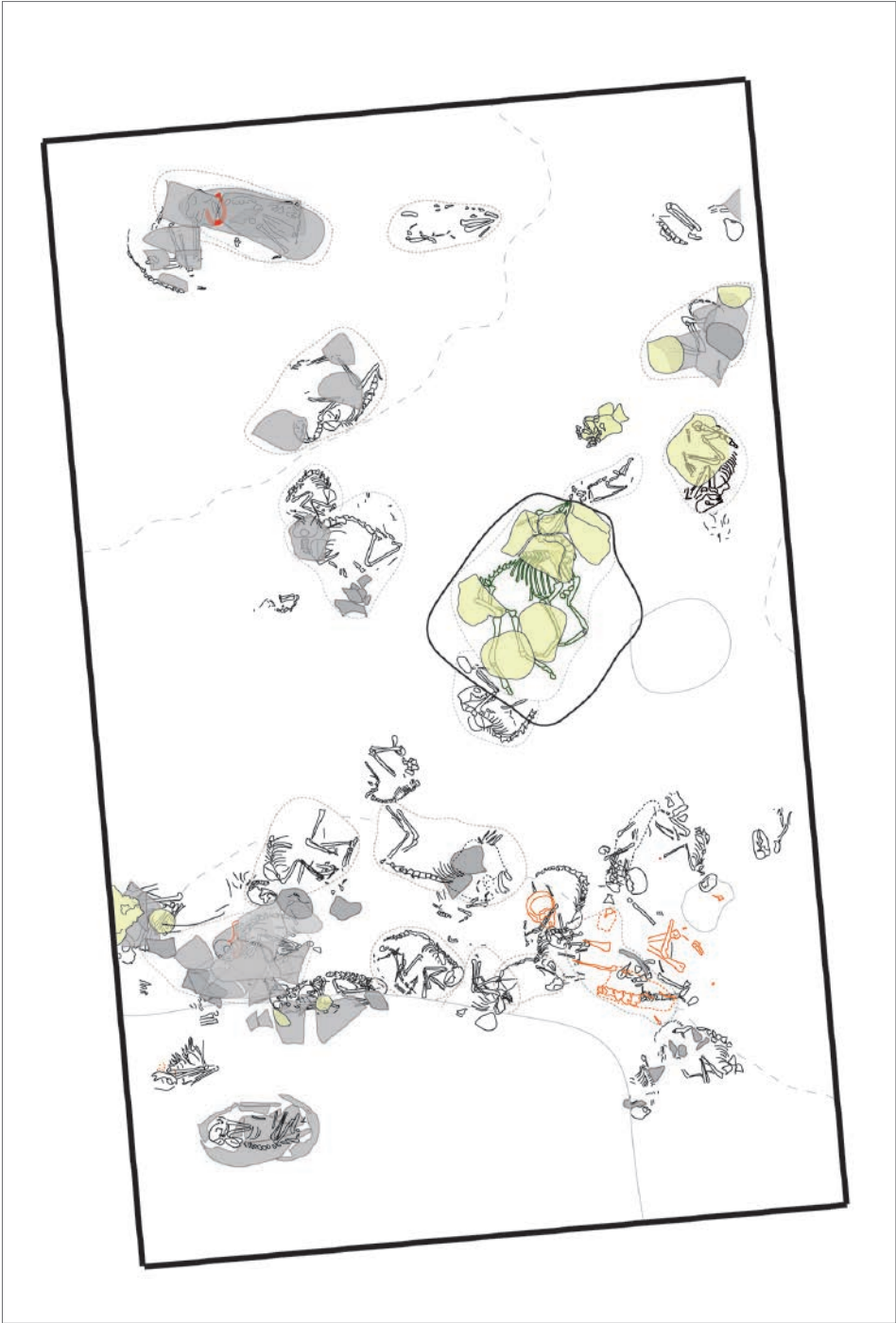


Fig. 2. Plan of the animal burials in trench BE18-107 excavated in 2018 (Berenike Project: PCMA UW-IAE PAN | drawing P. Osypiński)

## TRENCH BE15/18-107

The investigation of trench BE-107, initiated in 2015, was completed in the 2018 season, following a two-year break in fieldwork at Berenike. Exploration encompassed layers below a clay pavement dated to the first half of the 1st century AD (Osypińska and Osypiński 2018: Fig. 2).

Exploration of trench BE15/18-107 uncovered burials of small animals from a period preceding the mid-1st century AD reorganisation of space in this part of Berenike [Fig. 2]. The number of oldest burials in this area now stands at 26. They were all made in the top of a sandy unit of aeolian origin that separated the

Ptolemaic and early Roman phases in this area. An unusual goat burial post-dated the animal burial ground [Table 1].

The preservation of animal burials varied and depended largely on post-deposition activities (mostly subsequent burials). Hence, numerous burials have decomposed skeletons, contain incomplete skeletons or single bones from previously buried animals. In addition, natural diagenetic and geological factors, namely salinity, humidity and high temperatures, promoted increased bone decomposition. Especially in relation to the burials of young individual animals or bodies deposited in vessels, the

Table 1. Overview of animal burials excavated in trench BE15/18-107 (field seasons 2015 and 2018)

Species	Sex	Age	Quantity + comments
Phase I (before mid-1st century AD)			
Cat	F	Adult	2, locus 076, covered with potsherds
	M	Adult	1, locus 062, covered with potsherds
	n/d	Infant	3
	n/d	luvenis	7, loci 051, 059, 061, covered with potsherds/stones
	n/d	Subadult	5, locus 057, pathological changes; loci 060, 064, covered with stones/potsherds
	n/d	Adult	7, locus 077, covered with potsherds/ashlars; locus 072, wild or imported felidae(?)
Monkey	n/d	Infant	1, locus 068, bead necklace, Indian species
Phase II (after mid 1st century AD)			
Cat	n/d	Infant	2
	n/d	luvenis	16, loci 017, 021, 043, 045, covered with potsherds
	n/d	Subadult	3
	n/d	Adult	11, loci 013, 015, 025, 041, iron collars; locus 044, bead necklace; loci 019, 020, 041, 044, covered with potsherds
Monkey	n/d	luvenis	1, locus 022, Indian species
	F?	Adult	1, locus 042/036, Indian species
Fox	n/d	luvenis	1, locus 073
Post-cemetery (3rd century AD?)			
Goat	n/d	Adult	1, locus 067, dwarf breed, covered with stones

state of decomposition was so advanced that it prevented precise age and sex determination, and obstructed comprehensive archaeozoological analyses. Nevertheless,

burials in excellent condition were equally frequent, including the skeleton as well as evidence of behaviour, such as stomach contents or pilobezoars [Fig. 3].



Fig. 3. Examples of ecofacts indicating the behavior of companion animals in early Roman Berenike: fine fish remains as stomach content (above) and pilobezoars (below) (Berenike Project: PCMA UW-IAE PAN | photos M. Osypińska)

A number of unusual burials, not previously encountered at Berenike, were found in trench BE-107. Coming from the oldest phase, preceding the first half of the 1st century, is the burial of a sand fox (*Vulpes rueppellii*, locus 073). It was recorded at the edge of the trench (only the front part of the body could be examined). Also noted were the remains of a cat clearly deviating morphologically from the dominant domestic cat population of Berenike (locus 072). Previous research (Ottoni et al. 2017) had suggested that the transoceanic trade, evidence of which is attested at Berenike, also included specimens of companion animals. Indeed, monkeys from trench BE-107 represented varieties of macaques (locus 022) and rhesus monkeys (loci 042/036).

An archaeozoological study of the burials has contributed data on the behavior of domestic cats in early Roman Berenike. Of particular importance are the recorded pathological changes, this time observed on the skeleton of a young cat. Femoral fractures were evidently the most frequently incurred injury, occurring as a consequence of rickets. Although bone fractures previously noted in the Berenike animals had healed, there were cases of clear dislocation of the bones that would have impaired the motor skills of the living animal [Fig. 4].

The trench also produced a significant number of burials of both young and mature animals protected with potsherds and even complete vessels at times (locus 062), this in similarity to the earlier exca-



Fig. 4. Selection of pathological changes observed on companion animals from Berenike: healed bone fractures and signs of rickets (Berenike Project: PCMA UW-IAE PAN | photos M. Osypińska)



Fig. 5. Large potsherds and complete vessels securing individual animal burials (Berenike Project: PCMA UW-IAE PAN | photos P. Osypiński)



vated trenches in this area [Fig. 5]. Typically, these were amphorae preserved in large fragments enabling their typological identification (predominantly Egyptian Amphora 3, K. Domžalski, personal communication).

The trench yielded more examples of burials with iron collars preserved around the animal's neck [Fig. 6]. For the first time, however, burials were noted with necklaces stringing faience and glass

beads together (loci 044 and 068) [Fig. 7] on the necks of both cats and monkeys.

The goat burial is believed to be fairly unique (locus 067) [Fig. 8]. Archaeozoological studies have indicated that this animal was much smaller than the typical representatives of the population present in the area of Ptolemaic–Roman Berenike. The goat buried was only 50 cm tall at the withers and had clearly shortened metapodia. Typical goats at Berenike reached



Fig. 6. An iron collar in place around the neck of a monkey burial; bottom, an iron collar *in situ* (Berenike Project: PCMA UW–IAE PAN | photos P. Osypiński)



Fig. 7. Remains of three different bead collars and below, a bead collar on a burial *in situ* (Berenike Project: PCMA UW-IAE PAN | photos P. Osypiński, M. Osypińska)



Fig. 8. Burial of a goat from the BE-107 trench (Berenike Project: PCMA UW-IAE PAN | photo P. Osypiński)

78 cm in height and possessed features typical of the East African goat population, namely, slender and elongated limbs. The unusual morphological characteristics of the goat from the cemetery suggest the animal must have originated outside of northeastern Africa. The body of the ani-

mal was placed on its left side with limbs and head loosely placed and covered with several large stones. Following detailed research on this feature, it became clear that the burial was later than the small animals cemetery, that is, it belonged most likely to the beginning of the 3rd century AD.

## TRENCH BE01/18/19-48

The field documentation of a trench that was first excavated in 2001 recorded animal burials within an area 7 m by 4 m, in the early-Roman rubbish dump levels as well as in the sand underneath. This reflected the stratigraphic position of burials identified in neighboring trenches BE12-80 and BE15/18-107. It was also clear that the trench had reached sandy formations only in a small test (2 m by 1 m) by the east wall of the trench. Six animal carcasses, naturally mummified, had been noted in the horizon corresponding to early Roman trash and two in the underlying sand level (for these and a burial of a dog in neighboring trench BE00-31, see Sidebotham 2007: 49). The animal burials were not studied by an archaeozoologist at the time of excavation; they are in storage and will be analyzed for the purposes of the present grant.

The northern part of the trench, 4 m by 4 m in size, was explored in 2018 and another section, 3 m by 4 m, was investigated the following year in the southern part. Nearly all the discovered remains of animal burials in this space are dated to the period preceding the first half of the first century AD and were buried in the upper part of a sandy unit of aeolian origin [Fig. 9]. Only one cat burial, mum-

mified in a natural way, with still-present hair and remains of a textile wrapping the body (locus 100) was recorded in the freshly cut trench section flush with the rubbish layers post-dating the middle of the first century AD.

The shallow graves in loose aeolian sand layers were prone to mechanical erosion, hence the significant number of incomplete and destroyed burials, indicated by the presence of single bones.

The total number of animal burials recorded in this trench in the two reported seasons was 94 [Table 2], complementing the data on the extent of the cemetery in the first phase of its functioning.

First, in the initial phase of the functioning of the cemetery (first half of the 1st century AD), which is identified with burials preceding the new spatial arrangement, the cemetery clearly exceeded the area investigated so far. Tracing the actual extent of the early burials in an easterly direction would require deeper exploration of earlier trenches dug in this area and terminated upon reaching the top of the sand dunes. The recorded set of animal burials complements the extant database. It includes burials of cats with strings of glass, faience and organic beads, as

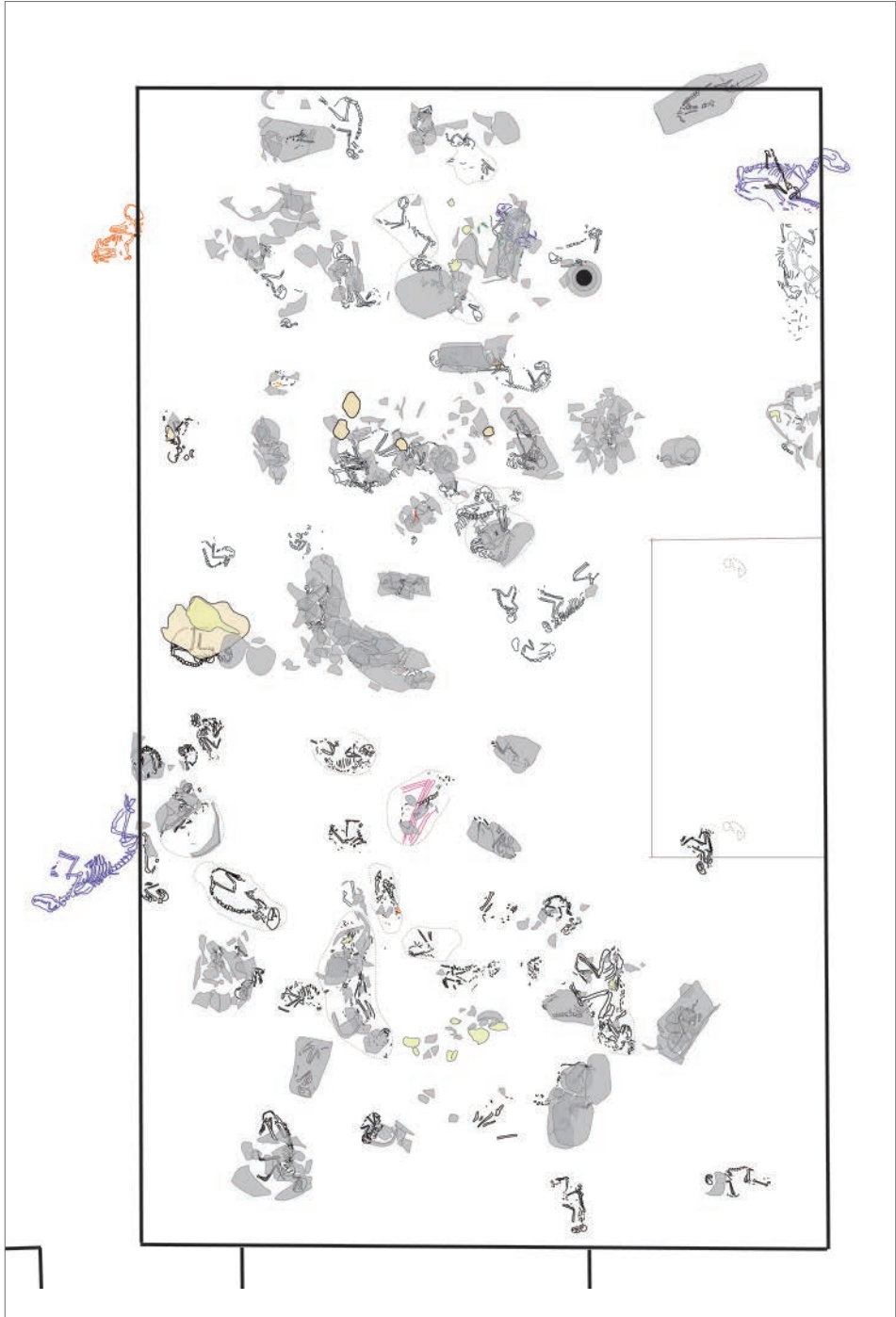


Fig. 9. Plan of the animal burials excavated in trench BE-48 in the 2018 and 2019 seasons (Berenike Project: PCMA UW-IAE PAN | drawing P. Osypiński)

well as iron collars. A single burial of a monkey (locus 159), a young macaque, exemplifies once again the practice of burying mainly young members of this group of mammals. The dog burials (loci 156 and 152) are particularly significant in that they present a wide spectrum of breeds living in ancient Berenike.

In the second, later phase, animal burials were much less frequent, set off distinctly by a culturally sterile layer of clay pavement in trenches BE12-80 and BE15/18-107 and the laminated top of sand dunes in the northern part of BE01/18/19-48. This did not follow the

pattern set for trenches to the west (BE14-107) or south (BE11-76, BE12-80), where just as many burials had been recorded as in the previous phase. This may suggest that after an enclosure wall was introduced in the mid-1st century AD (recorded in BE12-80, BE15-107 and BE19-132), small animals were buried only in the immediate vicinity of the structure. Significant quantities of rubbish deposited close to it may actually help to separate the two zones (trash dump and cemetery), providing a key to understanding the functioning of this space after the mid-1st century AD.

Table 2. Overview of animal burials excavated in trench BE-48 (field seasons 2018 and 2019)

Species	Sex	Age	Quantity + comments
Phase I (before mid 1st century AD)			
Cat	F	Adult	3, locus 121, pathologies; locus 130, bead necklace; loci 121, 152, covered with potsherds
	n/d	Neonatal	4, loci 149, 166, covered with potsherds
	n/d	Infant	20, loci 128, 138, bead necklace; loci 112, 117, 124, 127, 128, 170, 197, covered with potsherds
	n/d	luvenis	31, locus 115, pathologies; locus 116, iron collar; loci 118, 179, bead necklace; locus 178, with a bird's wing; loci 108, 115, 116, 118, 120, 125, 132, 141, 143, 165, 166, 171, 183, 184, 190, 191, 193, covered with potsherds/ashlars
	n/d	Subadult	16, locus 137, with a ruminant bone; loci 131, 134, 154, 157, 162, 163, 167, 182, covered with potsherds
	n/d	Adult	12, loci 126, 142, 145, 153, 164, 187, covered with potsherds
Dog	F	Adult	1, locus 152, small breed
	M	Adult	1, locus 194, pathologies
	M	Senilis	1, locus 156
	n/d	Infant	1, locus 136, covered with potsherds
	n/d	luvenis	2
Monkey	n/d	luvenis	1, locus 159, Indian species
Phase II (after mid 1st century AD)			
Cat	n/d	Subadult	1, locus 100, iron collar

## TRENCH BE19-132

A new trench, 5 m by 5 m in size, was traced directly next to the western baulk of trench BE12-80 and approximately 1 m west of the edge of trench BE-107 [see Fig. 1] in order to collect data on the extent of the burial ground to the west and to search for the stone wall structure recorded in neighboring trenches that appears to have been the centerpoint of all burial activities focused on cats, dogs and monkeys [Fig. 10].

The oldest features examined in the 2019 season were animal burials prior to the reorganisation of this space in the mid 1st century AD. Lower-lying burials in this horizon will be excavated in the future. Of the five burials from this phase, one should mention a cat burial furnished with an unusual copper-alloy collar (locus 026) [Fig. 12], contrasting with the standard iron collars. Its excellent state of preservation permitted close examination of the details of its technical execution and operation.



Fig. 10. Plan of the animal burials and other features in trench BE19-132 excavated in the 2019 season (Berenike Project: PCMA UW-IAE PAN | drawing P. Osypiński)

Table 3. Summary of animal burials excavated in trench BE19-132 (field season 2019)

Species	Sex	Age	Quantity + comments
Phase I (before mid 1st century AD)			
Cat	F	Adult	1
	M	Adult	1, locus 026, copper collar
	n/o	Subadult	2
Monkey	n/o	Infant	1, locus 033
Phase II (after mid 1st century AD)			
Cat	F	Adult	1
	n/o	Neonatal	2, loci 020, 021, covered with potsherds
	n/o	Infant	1, locus 008, iron collar
	n/o	juvenis	4, locus 008, iron collar; locus 016, copper element of collar(?)
	n/o	Adult	2, loci 023, 025, covered with potsherds/stones
Dog	F	Adult	1
	M	Adult	1
Monkey	n/o	Infant	1, locus 011, richly furnished: 3 cats, piglet, oceanic shell, pottery vessel, basket
Post-cemetery (3rd century AD?)			
Goat	n/o	Subadult	1, locus 009, covered with ashlar



Fig. 11. Relics of a stone wall corner recorded in BE19-132, looking south (Berenike Project: PCMA UW-IAE PAN | photo P. Osypiński)

Remains of the stone enclosure wall from the mid-1st century AD were documented [Fig. 11]. Previously its presence

had been confirmed merely as a ditch left by the robbers of the stone, dug probably in the early 3rd century AD. This wall ran



Fig. 12. Copper-alloy collar found on a cat burial in BE19-132 (Berenike Project: PCMA UW-IAE PAN | photo M. Osypińska)



Fig. 13. Grave goods recorded in a young rhesus burial from BE19-132 (upper level to the left; lower level to the right) (Berenike Project: PCMA UW-IAE PAN | photos P. Osypiński)



around the top of a sand dune, delimiting an area roughly 5 m by 4 m in size. A large-sized robbing pit was also discovered inside the enclosure [see Fig. 1]. Therefore, it cannot be ruled out that the zone also included an additional, central, dominant element that defined the functional character of this particular space. Stratigraphic observations indicate the dismantling of the wall might have been simultaneous with this central robbery pit.

Activities related to burying small animals in the period after the construction of the wall and the clay pavement surrounding it (existing from the mid 1st century AD) were again revealed in the immediate vicinity, or even inside the space limited by the wall. Among the 13 burials discovered in trench BE-132, a young monkey's

(*Cercopithecinae*) burial was identified (locus 011) [Fig. 12], richly equipped with ceramic and organic containers, an oceanic shell (*Haliotidae*) and the additional company of three young cats (juvenile + infant + infant) and a piglet (neonatal) [Table 3].

A subadult goat burial (locus 009) [Fig. 14] discovered at the northwestern corner of the dismantled wall contributed to the reinterpretation of an analogous goat burial at the northeastern corner of the wall, excavated in the neighboring trench BE-107 (locus 067, see above, Fig. 8). It is now clear that both these burials were closely related to the dismantling of the stone structure when the small animals were no longer buried around it. The dating of this event to the early 3rd century



Fig. 14. Burial of a goat at the northwestern corner of a stone enclosure in trench BE-132 (Berenike Project: PCMA UW–IAE PAN | photo P. Osypiński)

should be corroborated by the chronological interpretation of other finds categories, like ceramics, glass, and coins, coming from this horizon. The appearance of a new ethnic group at Berenike, namely a contingent of Palmyrean archers (Sidebotham 2011), and the assumed need to obtain construction materials for building a new temple (the so-called Palmyrean Temple) located just 70 m to the south of

trench BE-132 may have also been a contributing factor to this development. This hypothesis is supported by the presence of numerous remains of gazelle in the fill of the ditch from which the stones of the wall were robbed. Testimonies of hunting activities at Berenike are rare, especially in such intensity, and correspond to the duties of the contingent patrolling the desert trail between Berenike and the Nile valley.

## CONCLUSIONS

At the current stage of the project, the body of evidence for dating the founding and development of the small animal cemetery at Roman Berenike is growing. Small finds (pottery, ostraka and coins) and the stratigraphy indicate that the dune covering the remnants of Ptolemaic buildings in the northwestern part of the city began to be used as a place for burying animals in the first decades of the 1st century AD. The burial convention was fairly specific and, more importantly, unmatched in the practices known from the Nile Valley.

Burials concerned almost exclusively three groups of animals: cats, dogs and monkeys. They were concentrated mainly on the eastern slope of the dune and around its summit. Around the middle of the century, a new arrangement of the space was introduced. A wall that was half a meter thick was constructed, 5 m long and 4 m wide, with no sign of an inner floor to be interpreted as a closed room or building. A large robbery pit was noted in the middle. Outside the structure, a clay pavement surrounded the structure on at least three sides.

Over the next century or so, animals were buried around this enclosure, the

greatest density being right next to the wall. From the 2nd century, urban rubbish gradually encroached on this area. Most likely in the beginning of the 3rd century, the wall was dismantled. Whatever had stood inside the enclosure (statue, column, tree?) was also destroyed. In this period, two goats were buried at the northeastern and northwestern corners of the defunct structure. Of these, at least one represented a variant that is not typically found in northeastern Africa.

The ultimate size and function of this enclosure wall need to be investigated, as does the issues of whether the practice of burying goats at the corners concerned all four corners of the structure or only the ones on the north. The extent of the cemetery itself has yet to be ascertained, traing finds of complete cat and dog skeletons in the early Roman rubbish dump trenches excavated to date by the Berenike Project in the immediate vicinity to the east. The incomplete data from the earlier years of the excavation may now be supplemented and new trenches will be excavated in search of answers to the most important research questions emerging from the current state of knowledge on this unique cemetery.

**Dr. Piotr Osypiński**

<https://orcid.org/0000-0001-7843-224X>  
Institute of Archaeology and Ethnology,  
Polish Academy of Sciences, Poznań  
[piotr.osypinski@gmail.com](mailto:piotr.osypinski@gmail.com)

**Assist. Prof. Marta Osypińska**

<https://orcid.org/0000-0003-4603-9245>  
Institute of Archaeology and Ethnology,  
Polish Academy of Sciences, Poznań  
[archeozoo@tlen.pl](mailto:archeozoo@tlen.pl)

**How to cite this article:** Osypiński, P. and Osypińska, M. (2019). Excavation of the small animal cemetery at the Red Sea Roman harbor of Berenike in 2018 and 2019. *Polish Archaeology in the Mediterranean*, 28/2, 175–193. <https://doi.org/10.5604/01.3001.0013.6885>

**References**

- Osypińska, M. and Osypiński, P. (2017). New evidence for the emergence of the human-pet relation in early Roman Berenike (first–second century AD). In I. Zych (ed.), *Research on the Red Sea (=PAM 26/2)* (pp. 167–192). Warsaw: University of Warsaw Press
- Ottoni, C., Van Neer, W., De Cupere, B., Daligault, J., Guimaraes, S., Peters, J., ... Geigl, E.-M. (2017). The palaeogenetics of cat dispersal in the ancient world. *Nature Ecology & Evolution*, 1(7), 0139. <https://doi.org/10.1038/s41559-017-0139>
- Sidebotham, S.E. (2011). *Berenike and the ancient maritime Spice Route*. Berkeley: University of California Press
- Sidebotham, S.E. and Wendrich, W.Z. (eds). (2007). *Berenike 1999/2000: Report on the excavations at Berenike, including excavations in Wadi Kalalat and Siket, and the survey of the Mons Smaragdus Region*. Los Angeles, CA: Cotsen Institute of Archaeology, University of California, Los Angeles

